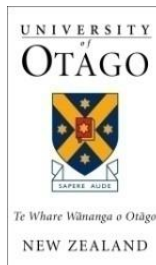


**THE DETERMINANTS OF HEALTH
FOR CHILDREN AND
YOUNG PEOPLE**

**IN THE NORTHERN DISTRICT
HEALTH BOARDS**



The Determinants of Health for Children and Young People in the Northern District Health Boards



This Report was prepared for the Northern DHBs by Jean Simpson, Glenda Oben, Elizabeth Craig, Judith Adams, Andrew Wicken, Mavis Duncanson and Anne Reddington of the New Zealand Child and Youth Epidemiology Service

November 2014

This report was produced as the result of a contract between the Northern District Health Boards and the University of Otago, on behalf of the NZ Child and Youth Epidemiology Service (NZCYES). The NZCYES is located in the Department of Women's and Children's Health at the University of Otago's Dunedin School of Medicine. While every endeavour has been made to use accurate data in this report, there are currently variations in the way data are collected from DHBs and other agencies that may result in errors, omissions or inaccuracies in the information in this report. The NZCYES does not accept liability for any inaccuracies arising from the use of this data in the production of these reports, or for any losses arising as a consequence thereof.

Acknowledgments:

The in-depth topic “Better Health for the New Generation: Getting it right from the start” was researched and written by Amanda Kvalsvig.

The in-depth topic “Effectiveness of Integrated Services (Health, Educational and Social)” was researched and written by Nadia Bartholomew.

Suggested citation:

Simpson J, Oben G, Craig E, Adams J, Wicken A, Duncanson M, and Reddington A. (2014) The Determinants of Health for Children and Young People in the Northern District Health Boards. Dunedin, NZ Child & Youth Epidemiology Service, University of Otago.

Cover Artwork: Southern Right Whale (Otago Harbour)

Pastel painting by Karen Davis

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INTRODUCTION AND OVERVIEW



INTRODUCTION AND OVERVIEW

Background

In February 2012, the Health Select Committee (HSC) initiated an inquiry “to find what practical health and social interventions could be made to promote children’s wellbeing in New Zealand, to prevent child abuse, and to break cycles of disadvantage, particularly from pre-conception to three years of age [1]”.

The first recommendation arising from this inquiry [1] was that the Government establish an evidence base for the economic value and cost-effectiveness of very early intervention programmes, from pre-conception to three years. Once strong evidence was established, the HSC recommended the Government move quickly to reprioritise investment towards achieving best practice in the areas of: reproductive health; prenatal, natal, postnatal, and whole-of-life nutrition; maternity and postnatal care; and health, early childhood education and social service interventions for the first three years of life, with a focus on the vulnerable, the disadvantaged, and Māori and Pasifika children [1].

The HSC also recommended that the Government continue to progress policies to address disadvantage and promote opportunity for all children; and that this should include poverty, discrimination, healthy housing, optimal nutrition, access to health and education services, and safe home environments. Further, the HSC recommended the Government publish an action plan setting out how it would address each area on a yearly basis, and employ a transparent monitoring system, with published results to demonstrate progress [1].

Report Aims

This report, which focuses on the underlying determinants of health for children and young people in the Northern DHBs aims to:

1. Provide a snapshot of progress in many of the areas covered by the HSC’s Inquiry including: child poverty and living standards, housing, early childhood education, oral health, tobacco use, alcohol related harm, and children’s exposure to family violence.
2. Assist District Health Board (DHB) staff to consider the roles other agencies play in influencing child and youth health outcomes in each of these areas.
3. Assist those working locally to utilise all of the available evidence when developing programmes and interventions to address child and youth health need.

In-Depth Topics

This year’s in-depth topics also focus on the importance of the very early years, and on developing whole-of-Government, inter-agency approaches to improving outcomes for children and families. Specifically, the issues covered in this year’s in-depth topics include:

Better Health for the New Generation: Getting It Right from the Start: This in-depth topic explores the complex ways in which maternal health and wellbeing during pregnancy and even before conception can affect child health. There is increasing evidence that these early stages of life are critical for the health and wellbeing of the next generation, not only in infancy but on into adulthood and throughout the life course. Service and intervention strategies are reviewed, followed by a discussion of the evidence gaps and of new approaches emerging in the literature in response to a recognition of the challenges involved in supporting healthy development right from the start.



The Effectiveness of Integrated Services (Health, Educational and Social): This in-depth topic explores the effectiveness of integrated services and how such programmes should be delivered to provide optimal benefit for children and their families. Worldwide there has been a move towards more integrated service delivery models. This has in part occurred due to increased service demand, rising costs and staff shortages and also because there have been social changes that have created problems for families in accessing services. This in-depth topic examines what integrated services are and what they are trying to achieve. The evidence for the effectiveness of integrated services, both in New Zealand and internationally, is discussed and factors that are needed for integrated services to be effective are identified. Consideration is given to how effective integrated services might be implemented in New Zealand.

Report Structure and Indicators

This report is the first of a three part series on the health of children and young people in the Northern DHBs and fits into the reporting cycle as follows:

Year 1 (2014): The Determinants of Health for Children and Young People

Year 2 (2015): The Health Status of Children and Young People

Year 3 (2016): Children and Young People with Chronic Conditions and Disabilities

As previously, this report is based on an Indicator Framework developed during the first three years of DHB reporting [2], with each of its indicators being assigned to one of four sections as follows:

- 1. The Wider Macroeconomic and Policy Context:** This section is divided into two parts with the first considering child poverty and living standards. Indicators include income-based poverty measures, material hardship, and poverty severity and persistence. The second part considers a range of macroeconomic indicators including Gross Domestic Product (GDP), income inequality, unemployment rates, children reliant on benefit recipients and young people reliant on benefits.
- 2. Socioeconomic and Cultural Determinants:** This section is divided into two parts, with the first considering factors related to household composition, including children living in sole parent households, and household crowding. The second part considers education as a determinant of health, with indicators including early childhood education, Māori medium education, Pacific education, highest attainment at school leaving, senior secondary school retention, stand-downs, suspensions, exclusions and expulsions, and truancy and unjustified absences.
- 3. Risk and Protective Factors:** This section is divided into three parts, with the first considering issues relevant to the Well Child/Tamariki Ora Schedule, including immunisation coverage and the uptake of Well Child/Tamariki Ora Services (Plunket and B4 School Checks). The second part, which focuses on oral health, reviews school dental service data and hospital admissions for dental caries. The third part considers a range of issues associated with substance use, including smoking in pregnancy, exposure to second-hand cigarette smoke, smoking in young people, and alcohol-related hospital admissions.
- 4. Health Outcomes as Determinants:** This section is divided into two parts, with the first considering hospital admissions and mortality from a range of socioeconomically sensitive conditions. The second part considers children and young people's exposure to family violence and assault, with indicators including injuries arising from the assault, neglect or maltreatment of children, injuries arising from assault in young people, notifications to Child Youth and Family, and Police family violence investigations.



Evidence-Based Approaches to Intervention

As previously, each of the sections in this year's report concludes with a brief overview of local policy documents and evidence-based reviews which consider population level approaches to prevention or management. **Appendix 1** provides an overview of the methodology used to develop these reviews. As previously, the quality and depth of evidence available varies considerably from indicator to indicator.

Data Quality Issues and Signalling Statistical Significance

Denominators

In this report, population estimates derived from the 2001, 2006, and 2013 Censuses (with linear extrapolations between Census years) have been used as the denominator in the majority of analyses. The results presented here, therefore, may differ from previous reports, which used population estimates derived from the 2001, 2006, and Statistics NZ population projections from 2007 onwards.

Statistical Significance Testing

Appendix 2 outlines the rationale for the use of statistical significance testing in this report. **Appendix 3** to **Appendix 5** contain information on the data sources used to develop each indicator. **Appendix 6** covers issues regarding measuring ethnicity. Readers are urged to be aware of the contents of these appendices when interpreting the information in this report. **Appendix 7** provides an overview of the NZ Deprivation Index. There are two deprivation indices used: NZDep 2013 is used where data relate to the 2013 Census and NZDep 2006 is used for the remaining data sources.

If tests of statistical significance have been used in a particular section, the text will have the words *significant*, or *not significant* in italics. Where the words *significant* or *not significant* do not appear in the text, the associations described do not imply statistical significance or non-significance. This is explained further in **Appendix 2**.

Overview of the Determinants of Health for Children and Young People in the Northern DHBs

Figure 1–Figure 4 provide an overview of the indicators in this year's report and how each DHB's rates compare to New Zealand as a whole.

Concluding Comments

This report provides an overview of the underlying determinants of health for children and young people in the Northern DHBs. It also aims to assist DHB staff to consider some of the other agencies influencing child and youth health locally. Such an inter-agency approach is necessary as addressing the large burden of avoidable morbidity and mortality experienced by children and young people locally remains a formidable task if attempted in isolation. Working jointly with Child Youth and Family and the Police to protect vulnerable children from intentional injury, or with Housing New Zealand and other social housing providers to ensure families can access affordable quality housing, are examples of tangible starting points.

Implementation of some of the integrated policy responses outlined in the evidence base review tables, or in the report's two in-depth topics commencing may result in significant health gains for children and their families. Finally, while addressing the underlying drivers of New Zealand's high child poverty rates remains beyond of the reach of the health sector alone, this should not preclude the sector from being involved in ongoing advocacy with the intention of ensuring that every child in New Zealand grows up to reach their full potential.



Figure 1. Summary indicator graph, Northland DHB compared to New Zealand

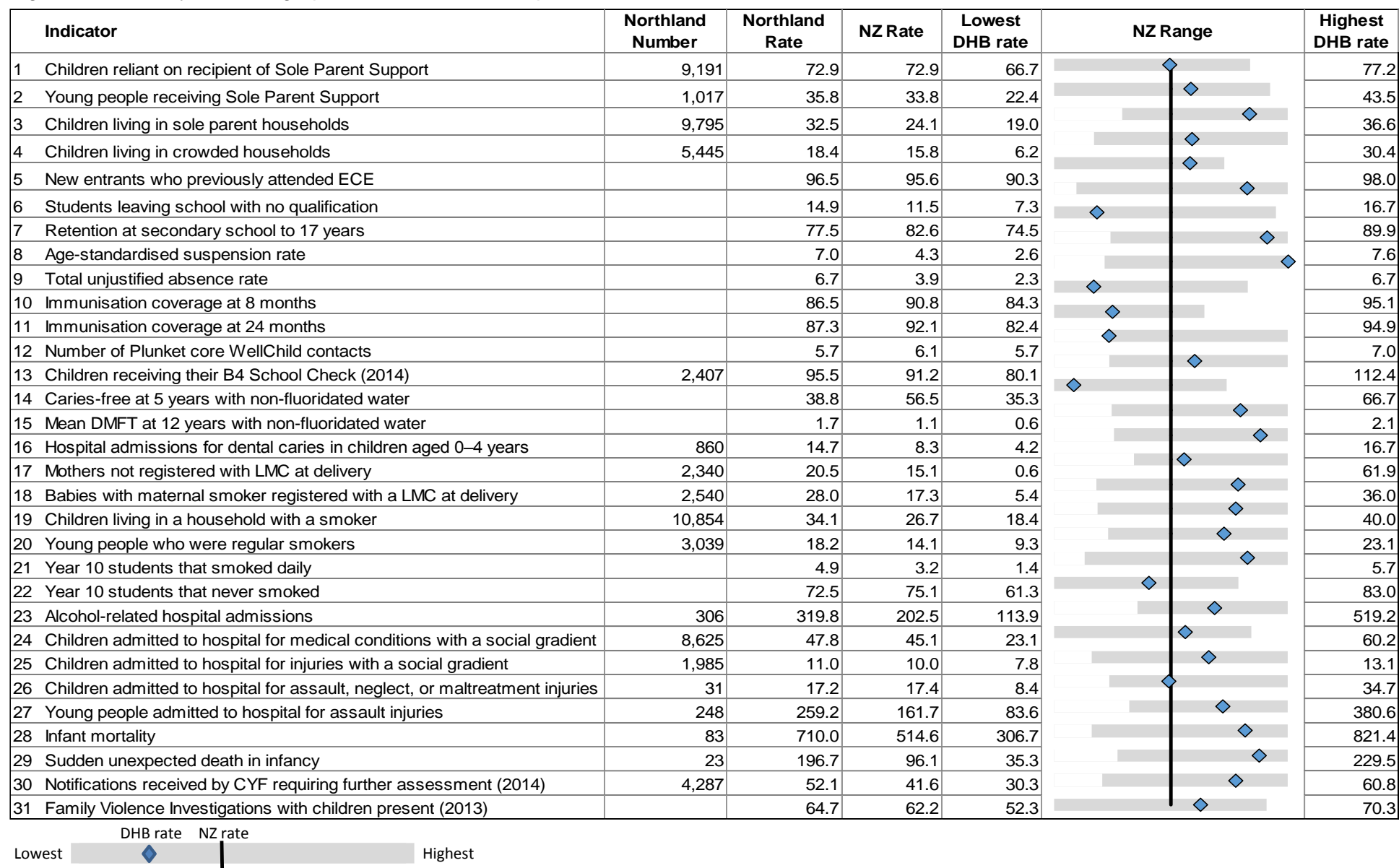


Figure 2. Summary indicator graph, Waitemata DHB compared to New Zealand

Indicator	Waitemata Number	Waitemata Rate	NZ Rate	Lowest DHB rate	NZ Range	Highest DHB rate
1 Children reliant on recipient of Sole Parent Support	14,013	72.6	72.9	66.7		77.2
2 Young people receiving Sole Parent Support	1,535	31.9	33.8	22.4		43.5
3 Children living in sole parent households	20,397	19.8	24.1	19.0		36.6
4 Children living in crowded households	13,938	13.7	15.8	6.2		30.4
5 New entrants who previously attended ECE		97.1	95.6	90.3		98.0
6 Students leaving school with no qualification		8.5	11.5	7.3		16.7
7 Retention at secondary school to 17 years		87.2	82.6	74.5		89.9
8 Age-standardised suspension rate		2.7	4.3	2.6		7.6
9 Total unjustified absence rate		2.9	3.9	2.3		6.7
10 Immunisation coverage at 8 months		91.0	90.8	84.3		95.1
11 Immunisation coverage at 24 months		92.8	92.1	82.4		94.9
12 Number of Plunket core WellChild contacts		6.2	6.1	5.7		7.0
13 Children receiving their B4 School Check (2014)	7,608	91.5	91.2	80.1		112.4
14 Caries-free at 5 years with non-fluoridated water		64.0	56.5	35.3		66.7
15 Mean DMFT at 12 years with non-fluoridated water		0.9	1.1	0.6		2.1
16 Hospital admissions for dental caries in children aged 0–4 years	978	5.1	8.3	4.2		16.7
17 Mothers not registered with LMC at delivery	4,947	12.6	15.1	0.6		61.9
18 Babies with maternal smoker registered with a LMC at delivery	3,333	9.7	17.3	5.4		36.0
19 Children living in a household with a smoker	21,993	20.7	26.7	18.4		40.0
20 Young people who were regular smokers	7,503	10.5	14.1	9.3		23.1
21 Year 10 students that smoked daily		1.7	3.2	1.4		5.7
22 Year 10 students that never smoked		82.5	75.1	61.3		83.0
23 Alcohol-related hospital admissions	581	152.9	202.5	113.9		519.2
24 Children admitted to hospital for medical conditions with a social gradient	25,271	45.3	45.1	23.1		60.2
25 Children admitted to hospital for injuries with a social gradient	4,857	8.7	10.0	7.8		13.1
26 Children admitted to hospital for assault, neglect, or maltreatment injuries	58	10.4	17.4	8.4		34.7
27 Young people admitted to hospital for assault injuries	544	143.2	161.7	83.6		380.6
28 Infant mortality	121	306.7	514.6	306.7		821.4
29 Sudden unexpected death in infancy	22	55.8	96.1	35.3		229.5
30 Notifications received by CYF requiring further assessment (2014)	4,875	41.0	41.6	30.3		60.8
31 Family Violence Investigations with children present (2013)		60.0	62.2	52.3		70.3

Figure 3. Summary indicator graph, Auckland DHB compared to New Zealand

Indicator	Auckland DHB Number	Auckland DHB Rate	NZ Rate	Lowest DHB rate	NZ Range	Highest DHB rate
1 Children reliant on recipient of Sole Parent Support	9,593	66.7	72.9	66.7		77.2
2 Young people receiving Sole Parent Support	958	29.4	33.8	22.4		43.5
3 Children living in sole parent households	14,817	20.1	24.1	19.0		36.6
4 Children living in crowded households	16,206	22.3	15.8	6.2		30.4
5 New entrants who previously attended ECE		94.8	95.6	90.3		98.0
6 Students leaving school with no qualification		8.1	11.5	7.3		16.7
7 Retention at secondary school to 17 years		89.9	82.6	74.5		89.9
8 Age-standardised suspension rate		3.2	4.3	2.6		7.6
9 Total unjustified absence rate		3.6	3.9	2.3		6.7
10 Immunisation coverage at 8 months		92.3	90.8	84.3		95.1
11 Immunisation coverage at 24 months		94.5	92.1	82.4		94.9
12 Number of Plunket core WellChild contacts		6.1	6.1	5.7		7.0
13 Children receiving their B4 School Check (2014)	5,151	80.1	91.2	80.1		112.4
14 Caries-free at 5 years with non-fluoridated water		53.0	56.5	35.3		66.7
15 Mean DMFT at 12 years with non-fluoridated water		1.7	1.1	0.6		2.1
16 Hospital admissions for dental caries in children aged 0–4 years	783	5.3	8.3	4.2		16.7
17 Mothers not registered with LMC at delivery	8,423	25.5	15.1	0.6		61.9
18 Babies with maternal smoker registered with a LMC at delivery	1,342	5.4	17.3	5.4		36.0
19 Children living in a household with a smoker	14,091	18.4	26.7	18.4		40.0
20 Young people who were regular smokers	6,570	9.3	14.1	9.3		23.1
21 Year 10 students that smoked daily		1.9	3.2	1.4		5.7
22 Year 10 students that never smoked		80.1	75.1	61.3		83.0
23 Alcohol-related hospital admissions	420	113.9	202.5	113.9		519.2
24 Children admitted to hospital for medical conditions with a social gradient	22,097	54.0	45.1	23.1		60.2
25 Children admitted to hospital for injuries with a social gradient	3,687	9.0	10.0	7.8		13.1
26 Children admitted to hospital for assault, neglect, or maltreatment injuries	42	10.3	17.4	8.4		34.7
27 Young people admitted to hospital for assault injuries	446	120.9	161.7	83.6		380.6
28 Infant mortality	148	444.7	514.6	306.7		821.4
29 Sudden unexpected death in infancy	25	75.1	96.1	35.3		229.5
30 Notifications received by CYF requiring further assessment (2014)	5,076	44.0	41.6	30.3		60.8
31 Family Violence Investigations with children present (2013)		52.3	62.2	52.3		70.3

Figure 4. Summary indicator graph, Counties Manukau DHB compared to New Zealand

Indicator	Counties Manukau No.	Counties Manukau Rate	NZ Rate	Lowest DHB rate	NZ Range	Highest DHB rate
1 Children reliant on recipient of Sole Parent Support	25,244	72.8	72.9	66.7		77.2
2 Young people receiving Sole Parent Support	2,911	43.5	33.8	22.4		43.5
3 Children living in sole parent households	29,427	27.6	24.1	19.0		36.6
4 Children living in crowded households	31,563	30.4	15.8	6.2		30.4
5 New entrants who previously attended ECE		90.3	95.6	90.3		98.0
6 Students leaving school with no qualification		14.8	11.5	7.3		16.7
7 Retention at secondary school to 17 years		81.8	82.6	74.5		89.9
8 Age-standardised suspension rate		3.8	4.3	2.6		7.6
9 Total unjustified absence rate		5.0	3.9	2.3		6.7
10 Immunisation coverage at 8 months		90.6	90.8	84.3		95.1
11 Immunisation coverage at 24 months		92.5	92.1	82.4		94.9
12 Number of Plunket core WellChild contacts		6.0	6.1	5.7		7.0
13 Children receiving their B4 School Check (2014)	8,076	90.2	91.2	80.1		112.4
14 Caries-free at 5 years with non-fluoridated water		58.2	56.5	35.3		66.7
15 Mean DMFT at 12 years with non-fluoridated water		0.9	1.1	0.6		2.1
16 Hospital admissions for dental caries in children aged 0–4 years	1,563	7.7	8.3	4.2		16.7
17 Mothers not registered with LMC at delivery	15,496	36.5	15.1	0.6		61.9
18 Babies with maternal smoker registered with a LMC at delivery	4,490	16.7	17.3	5.4		36.0
19 Children living in a household with a smoker	35,175	31.7	26.7	18.4		40.0
20 Young people who were regular smokers	9,675	13.7	14.1	9.3		23.1
21 Year 10 students that smoked daily		3.8	3.2	1.4		5.7
22 Year 10 students that never smoked		73.7	75.1	61.3		83.0
23 Alcohol-related hospital admissions	483	129.4	202.5	113.9		519.2
24 Children admitted to hospital for medical conditions with a social gradient	31,545	53.4	45.1	23.1		60.2
25 Children admitted to hospital for injuries with a social gradient	7,036	11.9	10.0	7.8		13.1
26 Children admitted to hospital for assault, neglect, or maltreatment injuries	116	19.6	17.4	8.4		34.7
27 Young people admitted to hospital for assault injuries	745	199.6	161.7	83.6		380.6
28 Infant mortality	293	664.3	514.6	306.7		821.4
29 Sudden unexpected death in infancy	52	117.9	96.1	35.3		229.5
30 Notifications received by CYF requiring further assessment (2014)	10,266	46.8	41.6	30.3		60.8
31 Family Violence Investigations with children present (2013)		64.6	62.2	52.3		70.3

REGIONAL DEMOGRAPHY

Although it has not often been stated explicitly, much of the interest in monitoring health status in recent years has been around benchmarking, and the desire to compare DHBs' performance on key indicators.

Undertaking such monitoring in a robust manner that simultaneously takes into account regional differences in age, ethnic composition, geography, and socioeconomic deprivation, while not impossible, is technically difficult due to New Zealand having multiple national datasets and a lack of appropriate denominators in electronic format.

Although adjusted rates may allow for a "fairer" comparison of performance between DHBs, for funding and planning purposes at the DHB level, crude rates are often more useful. Where a DHB's rates differ markedly from the national average, the DHB can then consider whether there are demographic factors such as the age structure or deprivation of the local population that are the probable explanation or whether the difference may be a sign of a performance issue. The report which follows uses unadjusted / crude rates to provide an overview of morbidity and mortality for children and young people in the Northern DHBs. To interpret these crude rates it is essential to have knowledge of regional demography as well as an understanding of the ways in which the underlying determinants of health, such as socioeconomic deprivation, influence population health outcomes. It is therefore suggested that, when reading the sections which follow, the reader considers the following questions:

1. What are the characteristics of the region's child and youth population in terms of age structure, ethnicity, and exposure to socioeconomic disadvantage? (*This information is provided in the current section on Regional Demography*)
2. For each health issue under review, how might this demographic profile influence the distribution of health outcomes at the population level? (*This information is provided by the rate ratio tables and graphs (ethnicity, gender, and NZDep Index decile) which appear in the national level analysis for each indicator*)
3. Do the region's actual rates for the health issue in question differ in any way from those that might be predicted based on an understanding of the region's demographic profile? (*This information is provided in the DHB level analysis for each indicator*)

In assisting the reader with the first of these tasks, the following section provides an overview of the demographic profile of the child and youth population at the time of the 2013 Census by age, ethnicity, and NZ Deprivation Index decile. Similar information is provided for births using information from the birth registration dataset.

The following section provides an overview of the demographic profile of the child and youth population at the time of the 2013 Census by age, ethnicity, and NZ Deprivation Index decile.

Data Source and Methods

Definition

Distribution of the child and youth population by age, ethnicity, and NZ Deprivation Index decile

Data Sources

Statistics New Zealand: 2013 Census

Notes on Interpretation of Data

Note 1: New Zealand's national health datasets have traditionally continued to use the previous Censuses' domicile codes for ≈ 2 years after any new Census, meaning that all of the information derived from the Birth Registration dataset is based on 2006 domicile codes and the NZDep2006 Index. In addition, NZDep is assigned on the basis of Domicile Code / Census Area Unit ($\approx 1-2,000$ people), so in regions where there appear to be no births in e.g. decile 10 areas, there still may be babies born into, for example, decile 10 meshblocks (smaller areas of ≈ 100 people). When these smaller meshblocks are aggregated into larger census area units, they collectively fail to achieve an overall decile 10 score.



Note 2: Prioritised ethnicity has been used throughout, with the ethnicity of those reporting multiple affiliations being prioritised in the following order: Māori, Pacific, Asian, Other, European (those identifying as “New Zealander’s” in the 2013 Census have been allocated to the European group).

Note 3: Tests of statistical significance have not been applied to the data in this section, so any associations described do not imply statistical significance or non-significance.

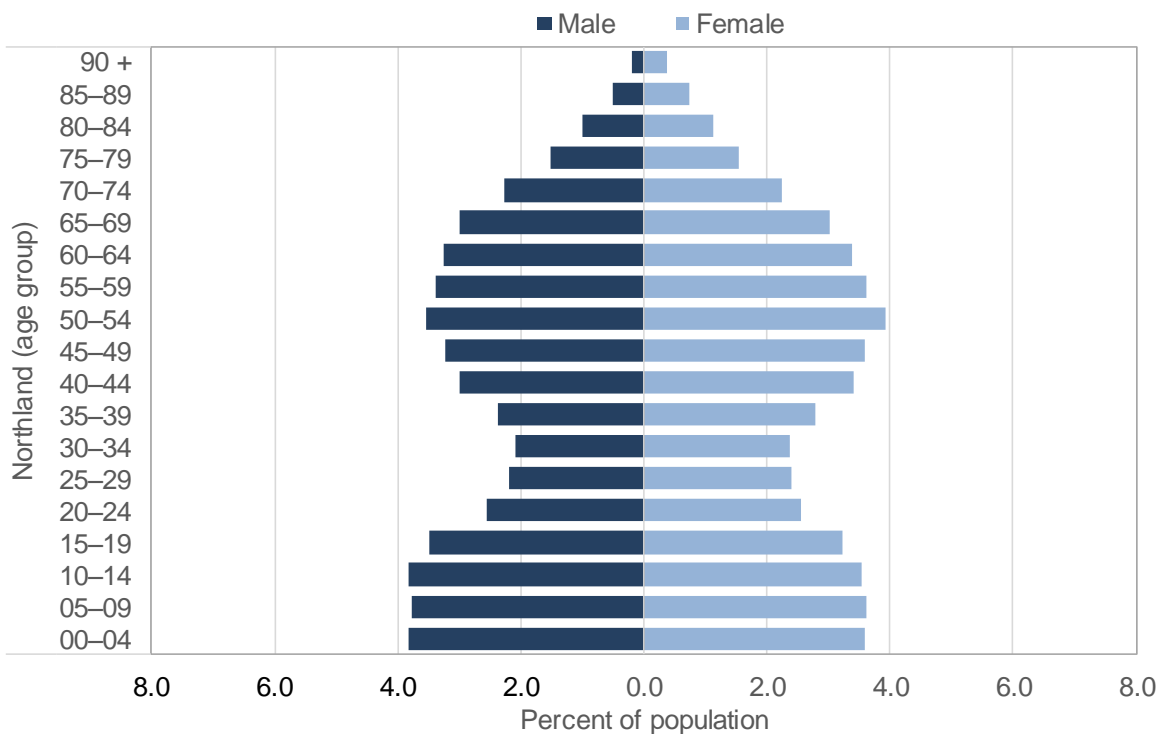
2013 Census Regional Population Profiles

Age Distribution

At the 2013 Census, children and young people comprised 33.9% of the Northland, 34.5% of the Waitemata, 34.2% of the Auckland and 39.4% of the Counties Manukau populations as compared to 34.6% for New Zealand as a whole.

The age profiles of the Northern DHBs varied from the New Zealand profile (**Figure 9**), with the highest proportion of people in Northland being in the 0–14 and 50–59 year age brackets (**Figure 5**), while in Waitemata the highest proportion were in the 40–49 year age bracket (**Figure 6**). In Auckland the highest proportion were in the 20–29 year age bracket (**Figure 7**), while in Counties Manukau the highest proportion were in the 0–19 year age bracket (**Figure 8**).

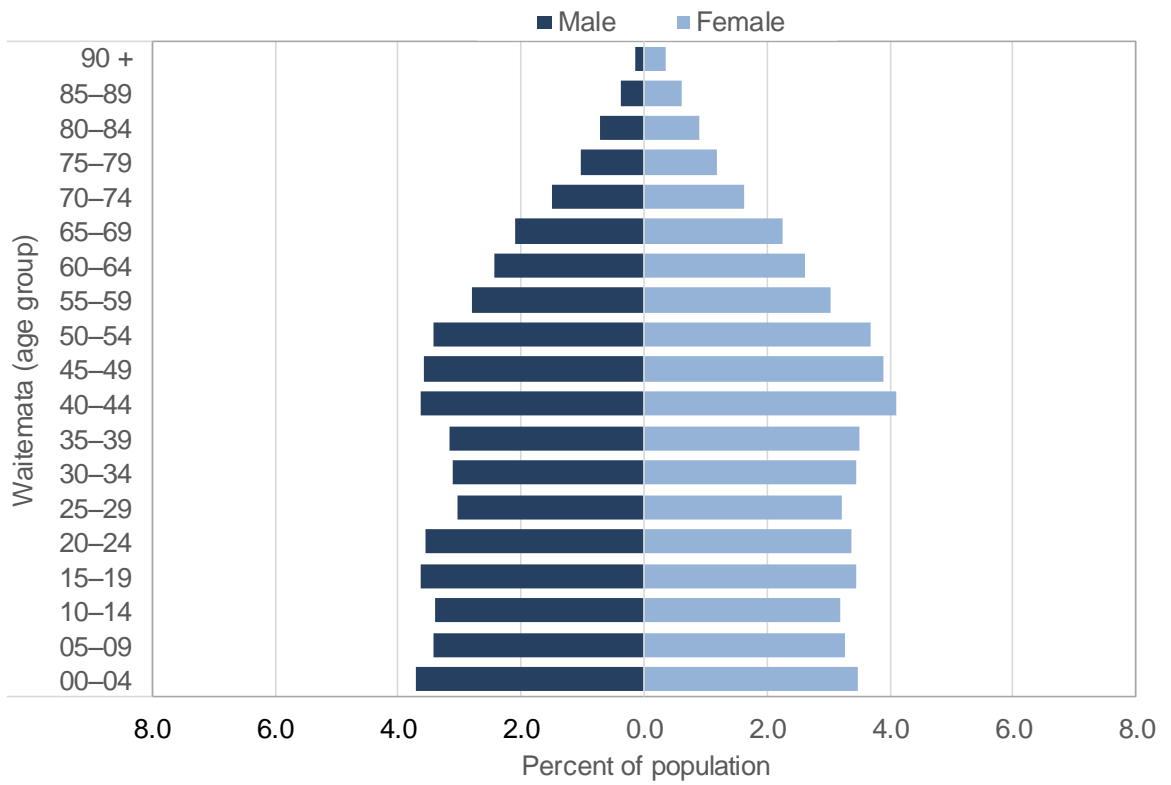
Figure 5. Population distribution at 2013 Census by age group, Northland DHB



Source: Statistics New Zealand

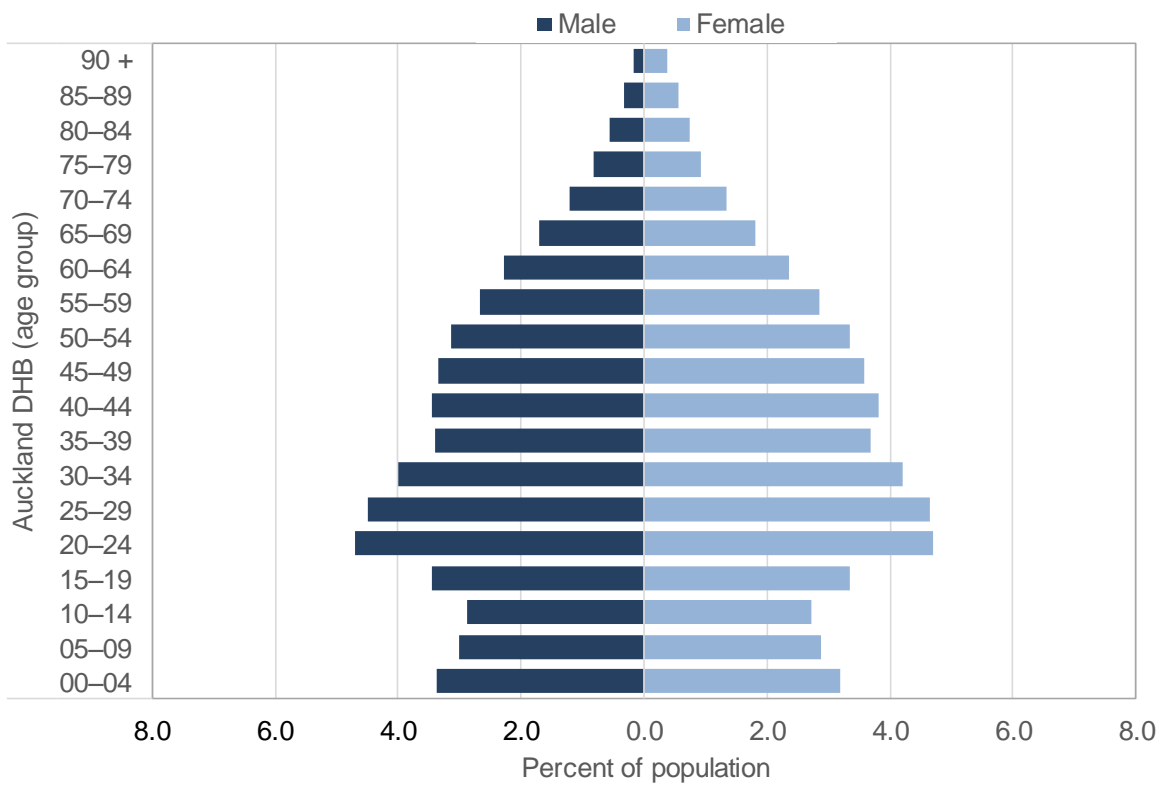


Figure 6. Population distribution at 2013 Census by age group, Waitemata DHB



Source: Statistics New Zealand

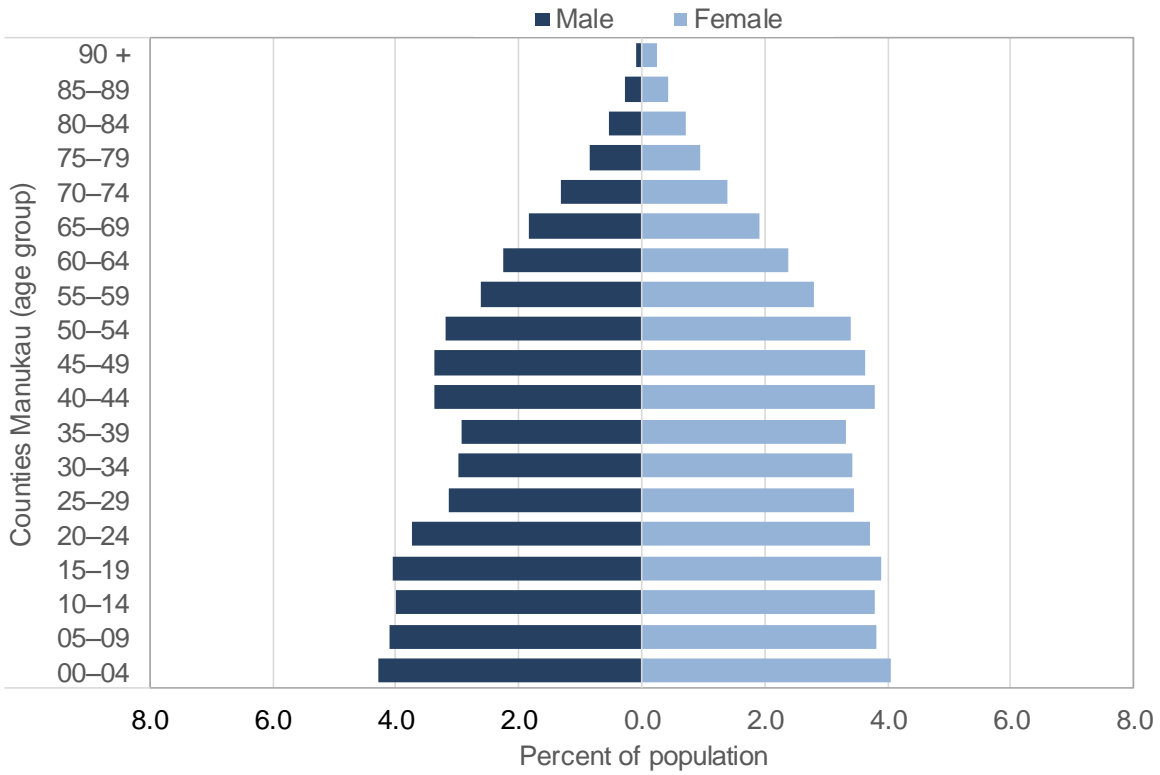
Figure 7. Population distribution at 2013 Census by age group, Auckland DHB



Source: Statistics New Zealand

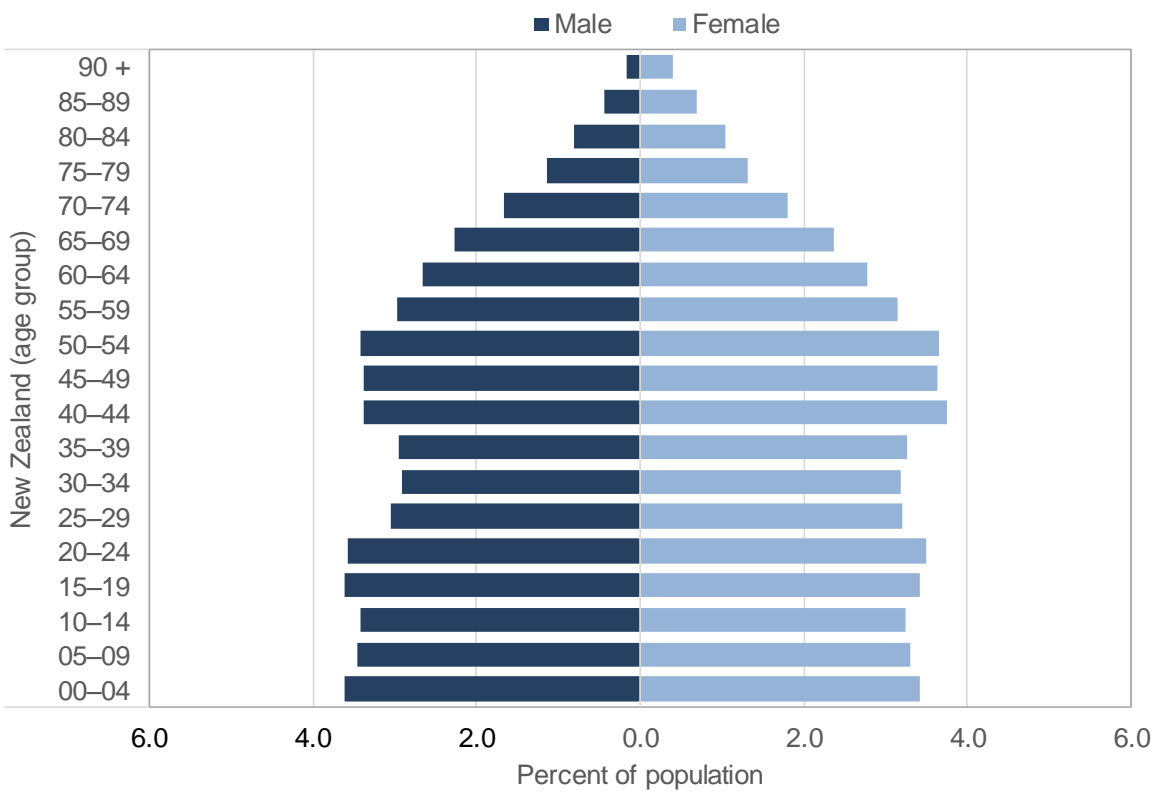


Figure 8. Population distribution at 2013 Census by age group, Counties Manukau DHB



Source: Statistics New Zealand

Figure 9. Population distribution at 2013 Census by age group, New Zealand



Source: Statistics New Zealand



Distribution by Prioritised Ethnicity and gender

In the Northern Region at the 2013 census, Northland DHB had the highest proportion of Māori children (51.7%), while Counties Manukau had the highest proportion of Pacific children (29.1%). The highest proportion of Asian/Indian (24.5%) and MELAA (Middle Eastern/Latin American/African) (2.6%) children lived in Auckland DHB. In contrast, Northland had the lowest proportions of Pacific, Asian/Indian and MELAA children of the Northern DHBs (**Table 1**). Similar patterns were seen for young people aged 15–24 years.

Distribution by NZ Deprivation Index decile

In Northland during 2013, 37.6% of children and young people lived in the most deprived (NZDep deciles 9–10) areas, while a further 20.8% lived in moderately deprived (NZDep Decile 8) areas. Similarly 49.3% of Counties Manukau and 26.0% of Auckland children and young people lived in the most deprived areas. In contrast, only 5.8% of Waitemata children and young people lived in the most deprived areas, with 25.8% living in the least deprived (NZDep Deciles 1–2) areas (**Figure 10**).

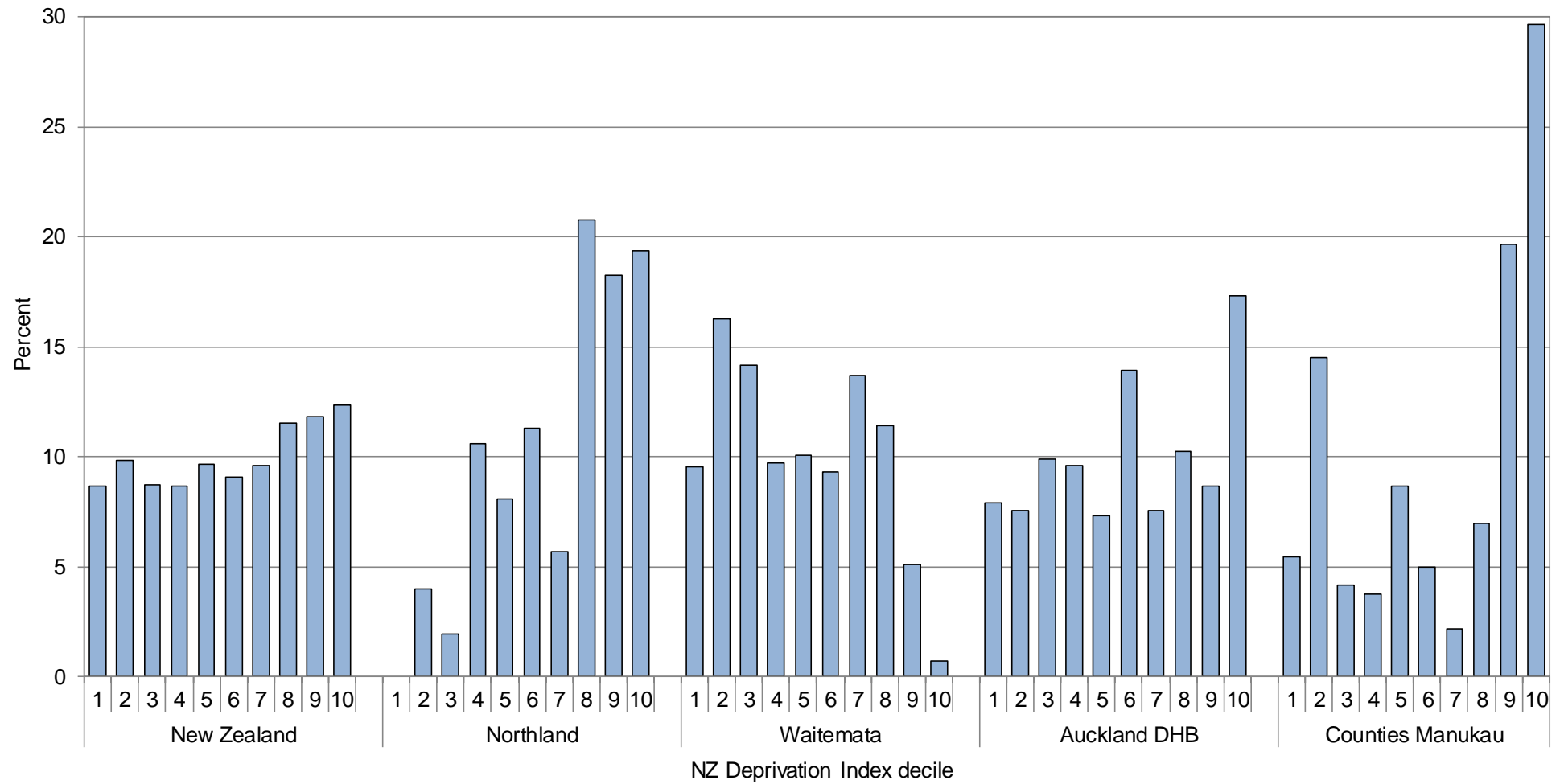


Table 1. Distribution of children and young people 0–24 years at 2013 Census by ethnicity and gender, Northern DHBs vs. New Zealand

Variable	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
	Northland		Waitemata		Auckland DHB		Counties Manukau		New Zealand	
Children aged 0–14 years										
Prioritised ethnic group										
Māori	18,850	51.7	18,650	16.5	10,670	12.8	28,610	24.0	233,000	25.6
Pacific	930	2.6	11,990	10.6	15,120	18.2	34,690	29.1	87,700	9.7
Asian/Indian	980	2.7	19,760	17.5	20,350	24.5	22,080	18.5	98,400	10.8
European	15,120	41.5	59,300	52.4	34,180	41.1	31,530	26.4	467,520	51.4
MELAA	110	0.3	2,150	1.9	2,120	2.6	1,590	1.3	11,470	1.3
Other	380	1.0	1,230	1.1	680	0.8	690	0.6	10,620	1.2
Gender										
Female	17,680	48.5	54,890	48.5	40,510	48.7	57,810	48.5	442,850	48.7
Male	18,760	51.5	58,240	51.5	42,590	51.3	61,470	51.5	465,920	51.3
Total	36,440	100.0	113,130	100.0	83,100	100.0	119,280	100.0	908,770	100
Young people aged 15–24 years										
Prioritised ethnic group										
Māori	9,150	47.0	10,500	13.6	7,770	10.4	14,860	19.4	127,750	20.4
Pacific	480	2.5	7,270	9.4	9,930	13.3	20,340	26.6	54,030	8.6
Asian/Indian	690	3.5	16,320	21.1	26,170	35.1	18,000	23.6	93,320	14.9
European	8,840	45.4	41,010	53.0	28,450	38.2	21,770	28.5	337,740	53.8
MELAA	30	0.2	1,690	2.2	1,820	2.4	1,160	1.5	8,700	1.4
Other	170	0.9	590	0.8	400	0.5	320	0.4	5,840	0.9
Gender										
Female	9,490	48.8	37,780	48.8	37,050	49.7	37,670	49.3	308,060	49.1
Male	9,960	51.2	39,600	51.2	37,480	50.3	38,750	50.7	319,350	50.9
Total	19,450	100.0	77,380	100.0	74,530	100.0	76,420	100.0	627,410	100
Children and young people aged 0–24 years										
Total	55,890		190,510		157,630		195,700		1,536,180	

Source: Statistics New Zealand; Ethnicity is Level 1 prioritised

Figure 10. Distribution of children and young people (0–24 years) at 2013 Census by NZ Deprivation Index decile, Northern DHBs vs. New Zealand



Source: Statistics New Zealand; Note: Deprivation Index decile is NZDep2013

REGIONAL BIRTHS

Introduction

The following section provides an overview of births in the region by ethnicity, maternal age, and NZ Deprivation Index decile using information from the birth registration dataset.

Data Sources and Methods

Indicator

Distribution of live births by ethnicity, NZ Deprivation Index (NZDep) decile, and maternal age

Data source

Birth registration dataset

Notes on Interpretation

Note 1: In this analysis, NZDep2006 decile has been assigned on the basis of Domicile Code / Census Area Unit (CAU ≈1,000–2,000 people). In regions where there were no births in e.g. decile 10 CAUs, there may still have been babies born into decile 10 meshblocks (smaller areas of ≈100 people), however, when these meshblocks were aggregated into CAUs, the CAU may not have a decile 10 ranking overall.

Note 2: The numbers of births presented here may vary slightly from those presented in previous years. The Ministry of Health no longer provides information on stillbirths in the birth registration dataset due to concerns about data quality. For this reason the current analysis is restricted to live births, rather than total births (including stillbirths) which were presented in previous years.

Note 3: Year is year of birth registration rather than year of birth.

New Zealand vs. Northern DHBs Distribution

Regional Trends

In the Northern Region during 2013, Counties Manukau (n=8,350) had the highest number of births registered while Northland (n=2,196) had the lowest. While the number of births in Northland in 2013 was similar to that in 2000, the number of births in the Auckland, Waitemata and Counties Manukau DHBs were generally higher (**Table 2–Table 4**).

Table 2. Distribution of live births by ethnicity, Northland DHB 2000–2013

Year	Māori	Pacific	Asian/Indian	European	Other	Not stated	Total
Northland							
2000	1,188	41	35	847	8	3	2,122
2001	1,117	34	34	797	9	3	1,994
2002	1,088	28	38	759	4	<3	1,918
2003	1,094	37	45	835	8	5	2,024
2004	1,164	36	32	835	17	3	2,087
2005	1,243	36	49	794	9	6	2,137
2006	1,306	51	36	859	43	4	2,299
2007	1,349	52	53	885	28	5	2,372
2008	1,373	58	34	866	35	<3	2,368
2009	1,334	45	50	783	20	<3	2,233
2010	1,471	60	74	829	20	<3	2,456
2011	1,320	52	59	807	23	0	2,261
2012	1,443	73	74	772	25	0	2,387
2013	1,363	49	64	703	17	0	2,196

Source: Birth registration dataset; Note: Year is year of birth registration



Table 3. Distribution of live births by ethnicity, Waitemata and Auckland DHBs 2000–2013

Year	Māori	Pacific	Asian/Indian	European	Other	Not stated	Total
Waitemata							
2000	1,352	815	660	3,639	91	5	6,562
2001	1,299	829	667	3,568	70	7	6,440
2002	1,244	845	829	3,416	115	10	6,459
2003	1,302	838	985	3,568	126	3	6,822
2004	1,346	899	1,085	3,655	145	7	7,137
2005	1,370	847	1,041	3,565	118	3	6,944
2006	1,516	915	1,042	3,606	232	7	7,318
2007	1,605	984	1,186	3,875	172	7	7,829
2008	1,661	1,016	1,217	3,850	193	7	7,944
2009	1,639	999	1,263	3,591	193	6	7,691
2010	1,726	1,008	1,451	3,728	193	0	8,106
2011	1,570	945	1,510	3,641	214	0	7,880
2012	1,489	917	1,843	3,503	198	3	7,953
2013	1,381	859	1,800	3,423	214	<3	7,678
Auckland DHB							
2000	906	1,372	1,180	2,413	147	5	6,023
2001	910	1,388	1,133	2,375	165	8	5,979
2002	826	1,240	1,248	2,442	142	5	5,903
2003	781	1,248	1,352	2,424	167	3	5,975
2004	828	1,290	1,524	2,515	136	5	6,298
2005	936	1,223	1,437	2,494	154	3	6,247
2006	957	1,260	1,346	2,500	214	8	6,285
2007	1,036	1,358	1,509	2,621	213	<3	6,738
2008	961	1,355	1,530	2,525	213	4	6,588
2009	964	1,341	1,651	2,544	230	<3	6,732
2010	950	1,353	1,695	2,482	216	4	6,700
2011	939	1,299	1,689	2,381	215	<3	6,524
2012	867	1,223	1,898	2,346	221	<3	6,556
2013	859	1,132	1,864	2,110	249	<3	6,215

Source: Birth registration dataset; Note: Year is year of birth registration



Table 4. Distribution of live births by ethnicity, Counties Manukau DHB 2000–2013

Year	Māori	Pacific	Asian/Indian	European	Other	Not stated	Total
Counties Manukau							
2000	2,120	2,252	795	2,088	46	8	7,309
2001	2,183	2,215	758	1,986	66	8	7,216
2002	2,012	2,230	901	1,992	62	6	7,203
2003	2,170	2,337	1,036	1,911	88	5	7,547
2004	2,264	2,413	1,165	1,972	105	4	7,923
2005	2,387	2,476	1,170	1,938	93	6	8,070
2006	2,613	2,444	1,150	1,915	136	9	8,267
2007	2,713	2,747	1,419	1,975	139	5	8,998
2008	2,666	2,864	1,454	1,926	138	4	9,052
2009	2,499	2,768	1,435	1,754	143	<3	8,600
2010	2,541	2,854	1,529	1,791	132	4	8,851
2011	2,347	2,917	1,550	1,647	147	0	8,608
2012	2,471	2,792	1,703	1,636	146	0	8,748
2013	2,250	2,569	1,780	1,617	133	<3	8,350

Source: Birth registration dataset; Note: Year is year of birth registration

Distribution by Ethnicity, Maternal Age, and NZDep Index Decile

In the Northern Region during 2013, Northland DHB had the highest proportion of Māori babies registered (62.1%), while Counties Manukau had the highest proportion of Pacific babies (30.8%) and Auckland DHB had the highest proportion of Asian/Indian (30.0%) babies. In contrast, Northland had the lowest proportions of Pacific, Asian/Indian and Other babies of the Northern DHBs (**Table 5**).

During the same period, Northland (9.8%) had the highest proportion of babies born to teenage mothers, while Auckland DHB (3.0%) had the lowest (**Table 5**).

Counties Manukau (54.3%), followed by Northland (40.9%) had the highest proportion of babies born in the most deprived (NZDep deciles 9–10) areas, while Waitemata DHB had the lowest (6.2%) (**Table 5**).



Table 5. Distribution of live births by ethnicity, maternal age, and NZ Deprivation Index decile, Northern DHBs vs. New Zealand 2013

Variable	Number of births	Percent of births	Number of births	Percent of births	Number of births	Percent of births	Number of births	Percent of births	Number of births	Percent of births
	Northland		Waitemata		Auckland DHB		Counties Manukau		New Zealand	
Ethnicity										
Māori	1,363	62.1	1,381	18.0	859	13.8	2,250	26.9	17,149	28.7
Pacific	49	2.2	859	11.2	1,132	18.2	2,569	30.8	6,438	10.8
Asian/Indian	64	2.9	1,800	23.4	1,864	30.0	1,780	21.3	8,707	14.6
European	703	32.0	3,423	44.6	2,110	34.0	1,617	19.4	26,036	43.6
Other	17	0.8	214	2.8	249	4.0	133	1.6	1,358	2.3
*Total	2,196	100.0	7,677	100.0	6,214	100.0	8,349	100.0	59,688	100.0
Maternal age										
<20 years	216	9.8	286	3.7	188	3.0	566	6.8	3,343	5.6
20–24 years	593	27.0	963	12.5	715	11.5	1,874	22.4	10,924	18.3
25–29 years	556	25.3	1,895	24.7	1,423	22.9	2,247	26.9	15,469	25.9
30–34 years	430	19.6	2,575	33.5	2,061	33.2	2,220	26.6	16,982	28.4
35+ years	401	18.3	1,959	25.5	1,828	29.4	1,443	17.3	12,983	21.7
*Total	2,196	100.0	7,678	100.0	6,215	100.0	8,350	100.0	59,701	100.0
NZ Deprivation Index decile										
Decile 1	0	0.0	465	6.1	324	5.2	301	3.6	4,055	6.8
Decile 2	59	2.7	1,059	13.8	371	6.0	917	11.0	4,972	8.4
Decile 3	30	1.4	1,039	13.5	611	9.8	282	3.4	4,880	8.2
Decile 4	225	10.2	666	8.7	599	9.6	284	3.4	4,945	8.3
Decile 5	152	6.9	871	11.3	398	6.4	724	8.7	5,805	9.8
Decile 6	217	9.9	757	9.9	871	14.0	418	5.0	5,492	9.2
Decile 7	134	6.1	1,271	16.6	565	9.1	222	2.7	6,208	10.4
Decile 8	481	21.9	1,071	14.0	864	13.9	666	8.0	7,647	12.9
Decile 9	398	18.1	418	5.4	575	9.3	1,817	21.8	7,412	12.5
Decile 10	500	22.8	60	0.8	1,037	16.7	2,719	32.6	8,088	13.6
*Total	2,196	100.0	7,677	100.0	6,215	100.0	8,350	100.0	59,504	100.0

Source: Birth registration dataset; Note: *Total: Some totals may differ due to a small number of births with missing information; Decile is NZDep2006

THE WIDER MACROECONOMIC AND POLICY CONTEXT



CHILD POVERTY AND LIVING STANDARDS



CHILD POVERTY: MEASUREMENT AND POLICY SOLUTIONS

“Children living in poverty are those who experience deprivation of the material resources and income that is required for them to develop and thrive, leaving such children unable to enjoy their rights, achieve their full potential and participate as equal members of New Zealand society” OCC EAG on Solutions to Child Poverty 2012 [3].

This definition encompasses the two approaches to child poverty measurement that have been most commonly used in New Zealand to date, with material deprivation or hardship referring to a family’s living standards and the degree to which a family must forgo key consumables (e.g. fruit and vegetables, shoes and clothing, heating) in order to make ends meet [4].

In contrast, income measures are based on a family’s disposable income (i.e. market income, less income tax, plus social assistance, including Working for Families tax credits) adjusted for family size and composition. Income poverty thresholds are traditionally set as a proportion of the national median household income, for example at 60% of the median household equivalent disposable income, after adjusting for housing costs. Median income refers to the mid-point of the distribution of all incomes in New Zealand, where half the number of households have income below that point, and half have incomes above [3,4].

This report includes two types of income poverty threshold. The first, the standard relative income poverty measure, compares incomes to 60% of the median in the current year. This measure is usually referred to as a relative, moving-line or relative-to-contemporary median measure. The second income measure included compares current incomes (expressed in the dollar value of a particular year, known as the reference year) to 60% of the median income in the reference year (e.g. 2007). This is often referred to as a fixed line measure [3,4].

Each group of measures captures a slightly different facet of economic wellbeing, as a family’s overall economic position is determined by its ability to access the resources it requires, in relation to its needs. In this context, current income, even if measured accurately and adjusted for household size and composition, is only one part of the equation, and other resources (e.g. savings, accumulated assets, access to cash in kind and extended family and community networks) also need to be taken into account. Similarly, families may have differing demands placed on their incomes including the servicing of pre-existing debts, health and disability costs, transport costs and the expectations of extended family members and community networks [5].

In recognition of this fact, in its report on Solutions to Child Poverty, the EAG [3] recommended that the Government monitor at least five different poverty measures:

1. Fixed-Line Income Poverty Measure
2. Moving-Line Income Poverty Measure
3. Material Deprivation Measure
4. Severe Poverty Measure
5. Measure of Poverty Persistence.

These five measures were selected because the EAG [3] believed it was important not only to assess families’ incomes, but also their day to day living standards. Measures of poverty severity and persistence were seen to be important, as the impact of poverty on child outcomes was believed to be greater when child poverty was severe, or lasted for long periods of time. The following sections review the data currently available in the New Zealand for each of these measures of child poverty.



CHILD POVERTY: INCOME-BASED MEASURES

Introduction

High rates of child poverty are a cause for concern, as low family income has been associated with a range of negative health, education, justice, labour market and social outcomes [6]. Negative health outcomes include low birth weight, infant mortality, poorer mental health and cognitive development, and hospital admissions from a variety of causes [7]. Research suggests that exposure to low family income during childhood and early adolescence may also increase the risk of leaving school without qualifications, economic inactivity, early parenthood and contact with the justice system. While adjusting for potentially confounding factors (e.g. parental education, maternal age, and sole parent status) reduces the magnitude of these associations somewhat, they do not disappear completely. This suggests that the pathways linking low family income to long term outcomes are complex, and in part may be influenced by other socioeconomic factors [8].

In New Zealand, the Ministry of Social Development uses a range of income based measures to monitor child poverty. All are based on a family's disposable income (i.e. market income, less tax, plus social assistance). This income has been equivalised: that is, adjusted for family size and composition. An income poverty threshold commonly used is a household equivalent disposable income of less than 60% of the median, after adjusting for housing costs. Two measures are used: the relative or standard measure that is calculated using the contemporary median income, and a fixed-line measure, which compares income to the median at a fixed point in time (1998 or 2007 in this report) [5].

The following section uses information from the NZ Household Economic Survey (NZHES) to review the proportion of children aged 0–17 years living in households with incomes below the 60% income poverty threshold (after tax, and adjusting for family size and composition) [5]. Because housing costs can consume a significant amount of a family's income, an after housing cost (AHC) measure provides a good picture of the resources available for other necessary spending.

Data Source and Methods

Indicator

1. Proportion of dependent children aged 0–17 years living below the 60% income poverty threshold before housing costs (BHC)
2. Proportion of dependent children aged 0–17 years living below the 60% income poverty threshold after housing costs (AHC)

Data Source

New Zealand Household Economic Survey (NZHES n=2,800–3,500 households per survey) via Perry 2014 [5]. Note: Child Poverty measures are reported on by the Ministry of Social Development using NZHES data [5] which it reports 2-yearly from 1982–1998, and 3-yearly thereafter. Since 2007, income data have been reported annually through the new HES Incomes Survey. The full NZHES (including expenditure data) remains 3-yearly. For more detail on methodology see Perry 2014 [5].

Notes on Interpretation

Note 1: Child poverty measures traditionally compare a household's income to the national median rather than the mean. The median is calculated by assigning individuals the income of their household, ranking them from those with the lowest to the highest income, and then finding the middle point of the income distribution. The mean income is usually higher than the median because a few households with a very high income will shift the mean upwards, but not the median. The number of very high income households varies from year to year so the mean is a less stable measure than the median. For more detail see Perry 2014 [5].

Note 2: Relative (or standard) poverty measures are defined in relation to the incomes of others in the same year. This gives a poverty benchmark that rises and falls with changes in national median incomes. Fixed-line poverty measures select a poverty benchmark at a set point in time (in this report these are 1998 or 2007) and adjust forward and back in time for changes in consumer prices to maintain a constant buying power over time.

In his 2014 update, Perry [5] notes that in real terms, the median income in 1998 was similar to 1982 so there is a good case for using 1998 as the reference year for fixed-line poverty calculations back to 1982, as well as forward from 1998. By 2007, however, the median was 16% higher than in 1998 and by 2009 26% higher, hence the reference year was changed to 2007.

Note 3: While reporting fixed-line poverty figures back to 1982 using 2007 as the reference tells us what proportion was 'poor' back then relative to 2007, this approach is not useful for assessing the extent of



hardship 'back then' relative to the standards of the day. In the analyses which follow, 2007 fixed-line figures are provided from 2007 onwards, with earlier years using 1998 as the reference year.

Note 4: Most income poverty measures use equivalised disposable household income (i.e. after tax household income adjusted for family size and composition). Both measures can be calculated before or after taking housing costs into account.

The Number of Children Living in Poverty in New Zealand

In 2013 in New Zealand, 260,000 (24%) dependent children aged 0–17 years were living in relative poverty using the measure of below 60% of the contemporary median income, after housing costs (**Table 6**). If a fixed-line measure is applied (in this case, below 60% of the 2007 median income), 230,000 (22%) of dependent children aged 0–17 years were living in poverty in 2013 (**Table 6**).

Table 6. Number and proportion of dependent children aged 0–17 years living below various poverty thresholds, New Zealand 2001–2013 HES selected years

HES Year	Before housing costs		After housing costs					
	<60% contemporary median		<50% contemporary median		<60% contemporary median		<60% 2007 median	
	Number	% of children	Number	% of children	Number	% of children	Number	% of children
2001	250,000	24	215,000	21	310,000	30	380,000	37
2004	270,000	26	200,000	19	290,000	28	320,000	31
2007	210,000	20	170,000	16	240,000	22	240,000	22
2009	210,000	19	195,000	18	270,000	25	230,000	22
2010	245,000	23	200,000	19	300,000	28	260,000	24
2011	230,000	22	210,000	20	285,000	27	255,000	24
2012	220,000	21	205,000	20	285,000	27	240,000	23
2013	215,000	20	205,000	19	260,000	24	230,000	22

Source: Perry 2014 [5], derived from Statistics New Zealand Household Economic Survey (HES) 1982–2013

Child Poverty Trends Using Different Measures

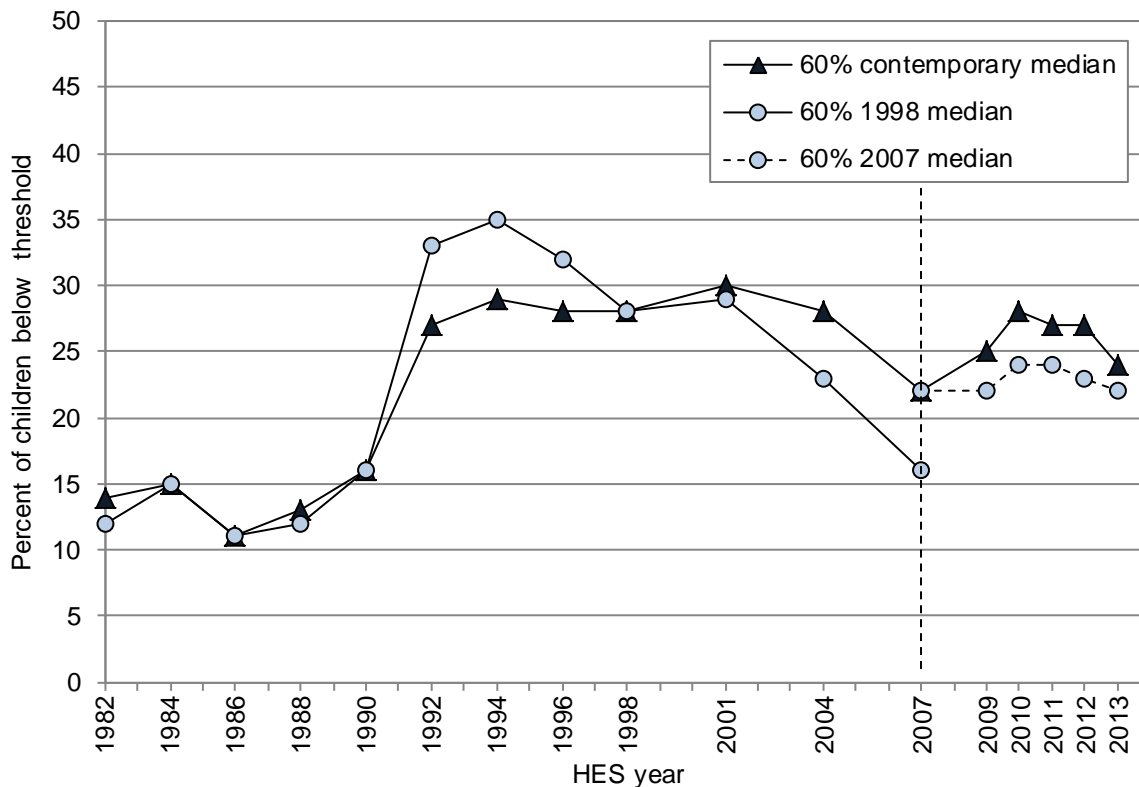
Relative or fixed-line poverty

Information about people in lower income households is gained from examining relative poverty measures (using the contemporary median) or fixed-line or constant value poverty measures (using 1998 or 2007 as the set points in time) with each method providing a different perspective [5] (see Methods box above).

Both relative and fixed-line measures show the rapid rise in child poverty in New Zealand during 1990–1992 that has been attributed to rising unemployment and cuts made to benefits in 1991 [5]. These benefit cuts reduced incomes for beneficiaries disproportionately. During 1992–1998, child poverty declined as a result of falling unemployment and the incomes of those around the poverty line rose more quickly than the median. After 1998, as economic conditions improved, the median income rose again. Incomes for many low-income households with children did not, however, and child poverty continued to rise until 2004. The decline in poverty rates from 2004 to 2007 resulted from the Working for Families package [5]. Between 2007 and 2010 child poverty rates increased, then declined, so that in 2013 the rates were nearly equal to those in 2007 (**Figure 11**).



Figure 11. Percentage of dependent children aged 0–17 years living below the 60% income poverty threshold (relative and fixed-line) after housing costs, New Zealand 1982–2013 HES years



Source: Perry 2014 [5], derived from Statistics New Zealand Household Economic Survey (HES) 1982–2013

Before Housing Costs (BHC) or After Housing Costs (AHC)

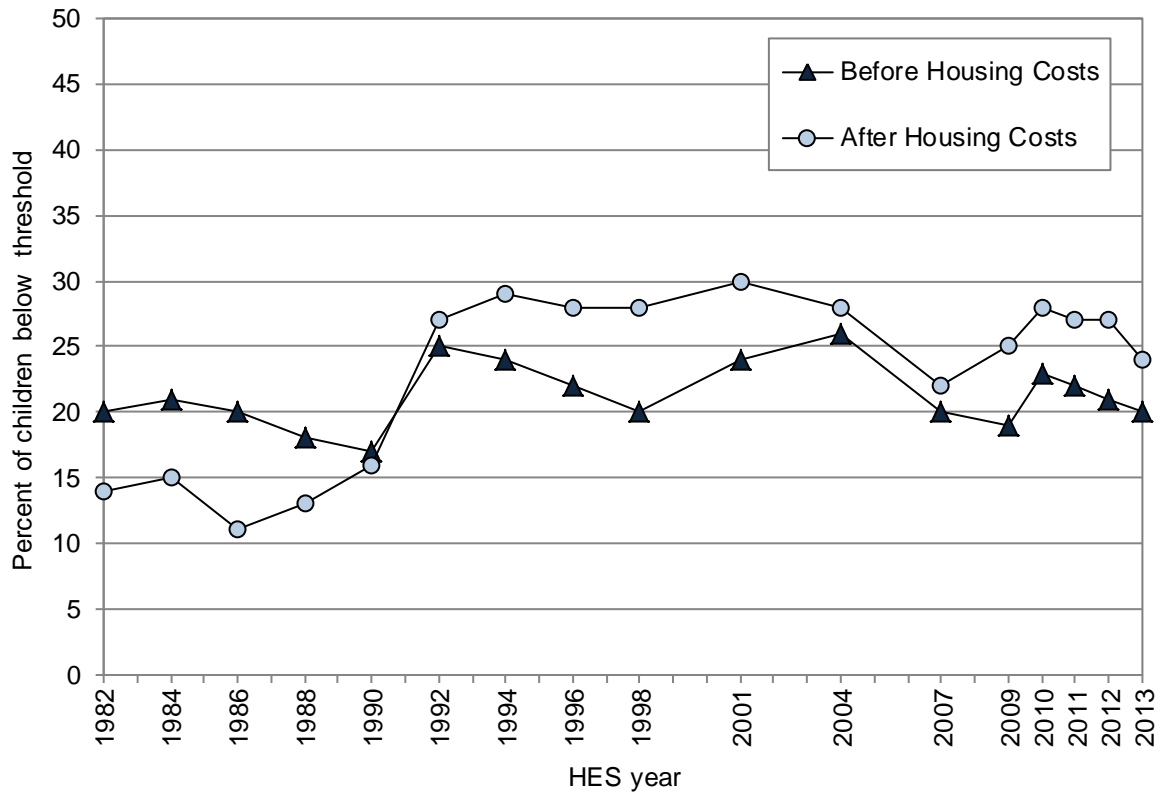
Housing costs can be a substantial component of a household’s expenditure. Figure 12 shows the proportion of children living in households below the relative poverty threshold (<60% of contemporary median) before housing costs (BHC) and after housing costs (AHC) have been accounted for. The proportion shown BHC fluctuated in 1982–2013, but in the years 1982 and 2013 20% of children were below the poverty threshold. In comparison, the proportion of children below the threshold after housing costs (AHC) was lower than for the BHC proportion in 1982, then shared the same rapid rise in 1990 as the BHC, but rose further from 1992 onwards and remained higher even after a decline between 2001–2007 and again between 2010–2013 (Figure 12).

Housing costs in 2012 accounted for a higher proportion of household expenditure for low-income households than such costs in the 1980s. In 1988, 17% of households in the lowest income quintile spent more than 30% of their income on housing in 1994 this was the highest at 52% of households, and in 2007, 39% of households [5]. Perry noted that the income-related rental policies introduced in 2000, along with later changes to accommodation supplements (AS), helped reduce housing expenditure for some low income households. These changes contributed to reductions in AHC child poverty during 2001–2007. There were no further policy changes during 2007–2012 and maximum rates of assistance remaining fixed although housing costs continued to increase [5]. This resulted in increases in the AHC child poverty rates during 2007–2010 (Figure 12).

Similar changes are seen using a fixed line poverty measure. The AHC trend for the fixed line poverty threshold (<60% 1998 median) during 1984–2008, was broadly similar to that of the BHC trend with the AHC poverty rate in 2007 being just a little higher than the AHC rate in the 1980s (Figure 13).

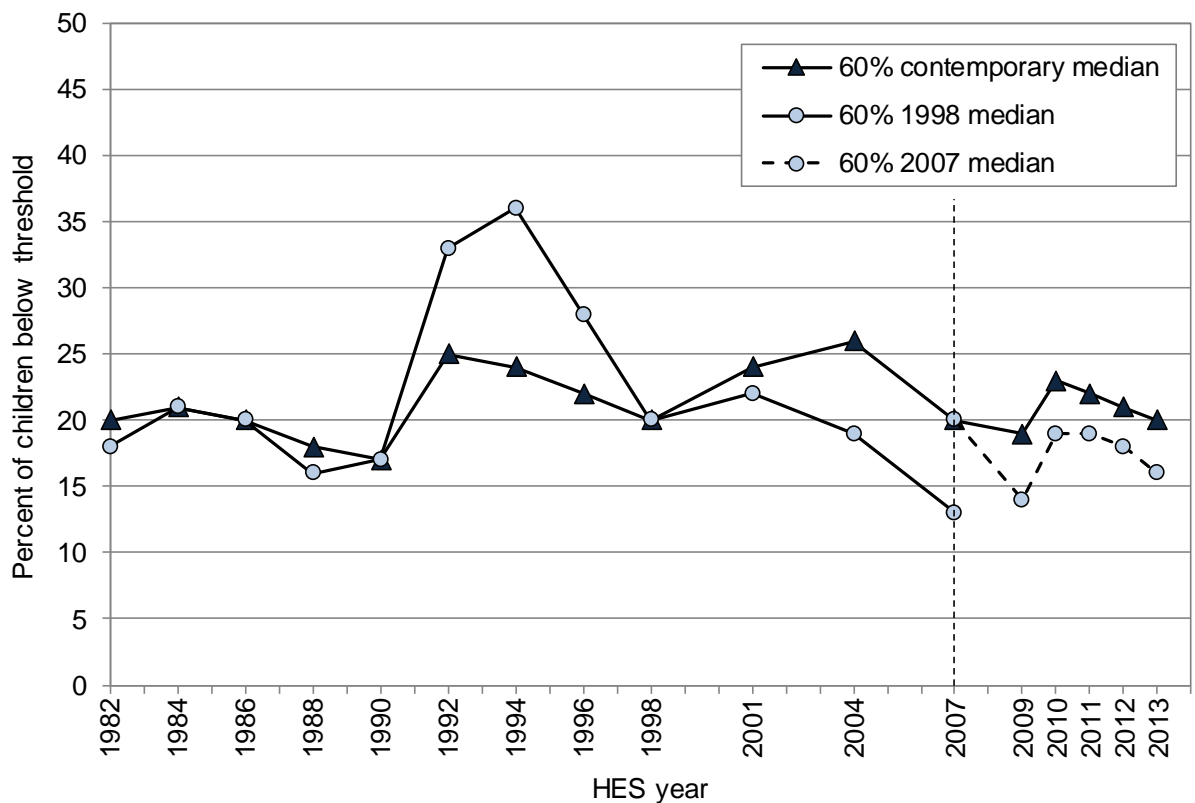


Figure 12. Percentage of dependent 0–17 year olds living below the 60% income poverty threshold (relative) before and after housing costs, New Zealand 1982–2013 HES years



Source: Perry 2014 [5], derived from Statistics New Zealand Household Economic Survey (HES) 1982–2013

Figure 13. Percentage of dependent children aged 0–17 years living below the 60% income poverty threshold before housing costs, New Zealand 1982–2013 HES years



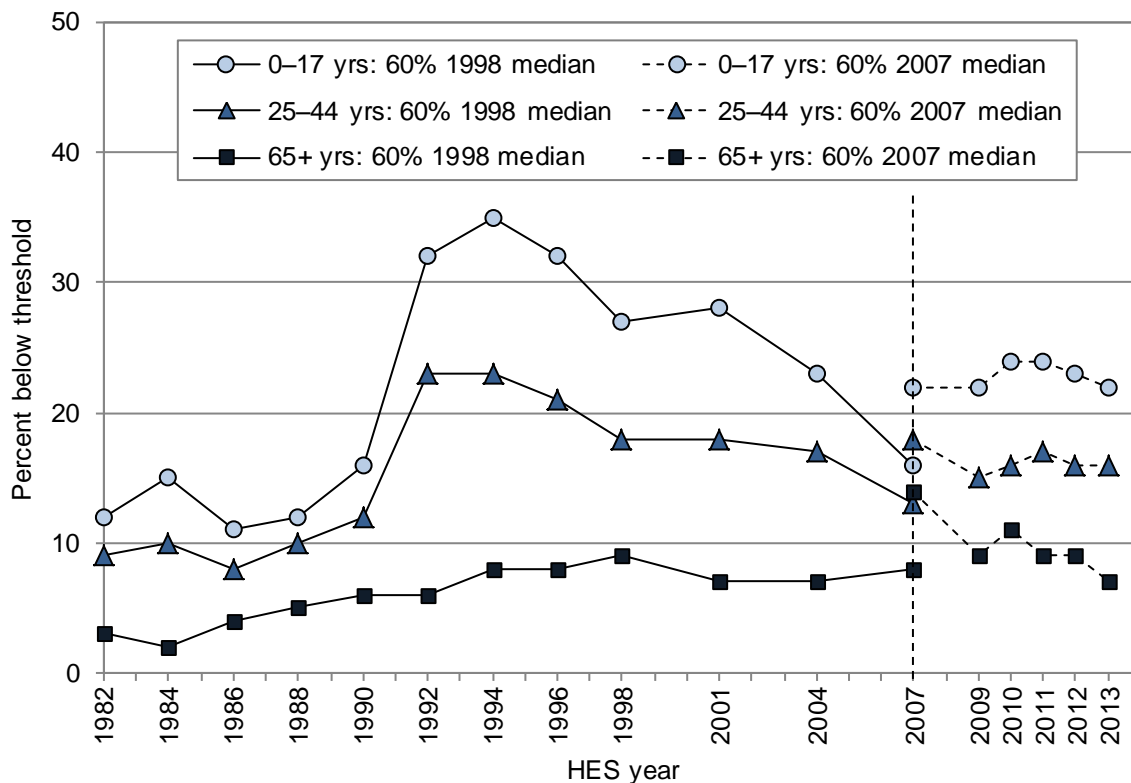
Source: Perry 2014 [5], derived from Statistics New Zealand Household Economic Survey (HES) 1982–2013

Child Poverty and Demographic Factors

Poverty by Age

In 2013, children aged 0–17 years were three times more likely to be in poverty than those aged 65+ years. During 1982–2013, poverty rates in New Zealand were consistently higher for children aged 0–17 years than for adults aged 25–44 years with the lowest poverty rates being seen amongst those aged 65+ years (**Figure 14**).

Figure 14. Percentage of population living below the 60% income poverty threshold after housing costs by selected age-group, New Zealand 1982–2013 HES years



Source: Perry 2014 [5], derived from Statistics New Zealand Household Economic Survey (HES) 1982–2013

Child Poverty by Ethnicity

Over the period 2011–2013, on average, around 34% of Māori children and 28% of Pacific children lived in poor households, compared to an average of 16% of European children (using the AHC 60% fixed-line measure) [5]. The higher poverty rates seen in Māori children potentially reflect the relatively high proportion of Māori children living in sole parent beneficiary households (during 2007 to 2011 around 43% of domestic purpose benefit (DPB) recipients were Māori). On average, during 2011 to 2013, just under half (48%) of children living in poverty were Māori or Pacific, using the AHC 60% fixed line measure [5].

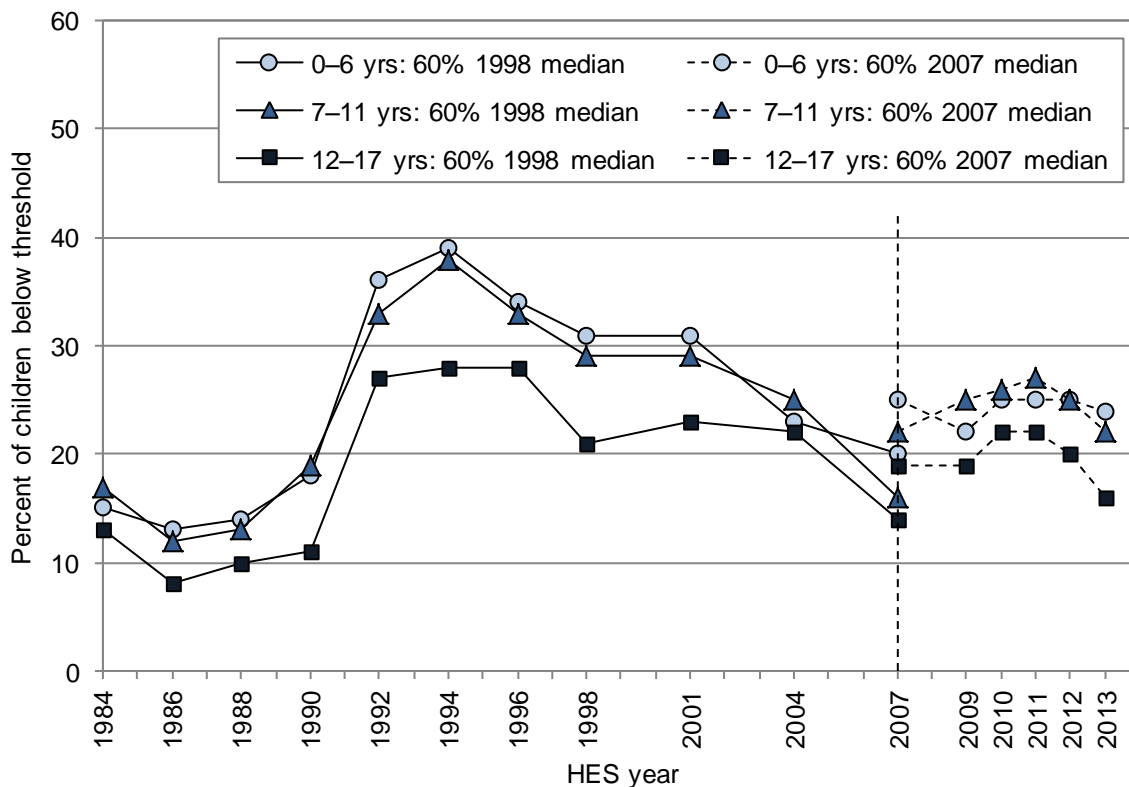
No time series data are available for ethnicity, however, Perry reports that poverty rates for Pacific and Māori children are consistently higher than for European children [5]. Limited analyses by ethnic group are reported in the NZHES [5] because of the relatively small sample sizes for Māori, Pacific and Other ethnic groups.

Child Poverty by Children's Age

In New Zealand throughout 1984–2013, poverty rates for younger children (0–6 years and 7–11 years) were generally higher than for older children (12–17 years) (**Figure 15**).

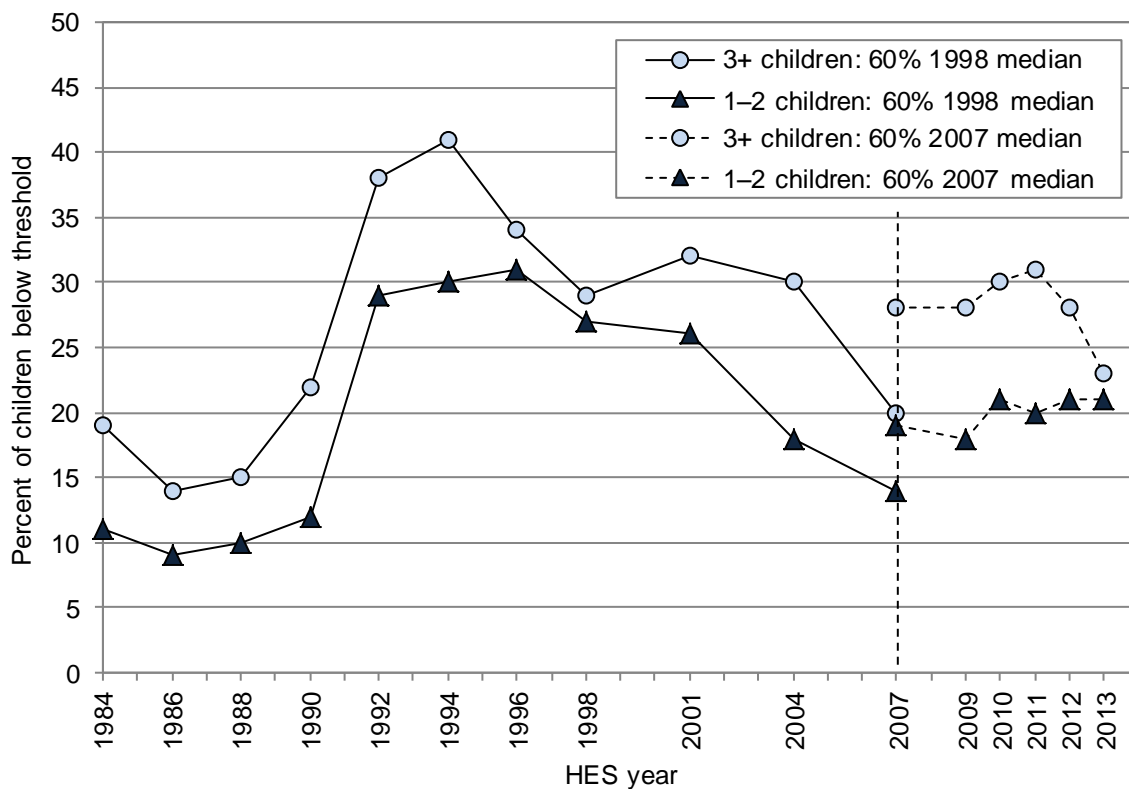


Figure 15. Percentage of dependent children aged 0–17 years living below the 60% income poverty threshold after housing costs by age, New Zealand 1984–2013 HES years



Source: Perry 2014 [5], derived from Statistics New Zealand Household Economic Survey (HES) 1984–2013

Figure 16. Percentage of dependent children aged 0–17 years living below the 60% income poverty threshold, after housing costs, by number of children in household, New Zealand 1984–2013 HES years



Source: Perry 2014 [5], derived from Statistics New Zealand Household Economic Survey (HES) 1984–2013



Child Poverty by Number of Children in Household

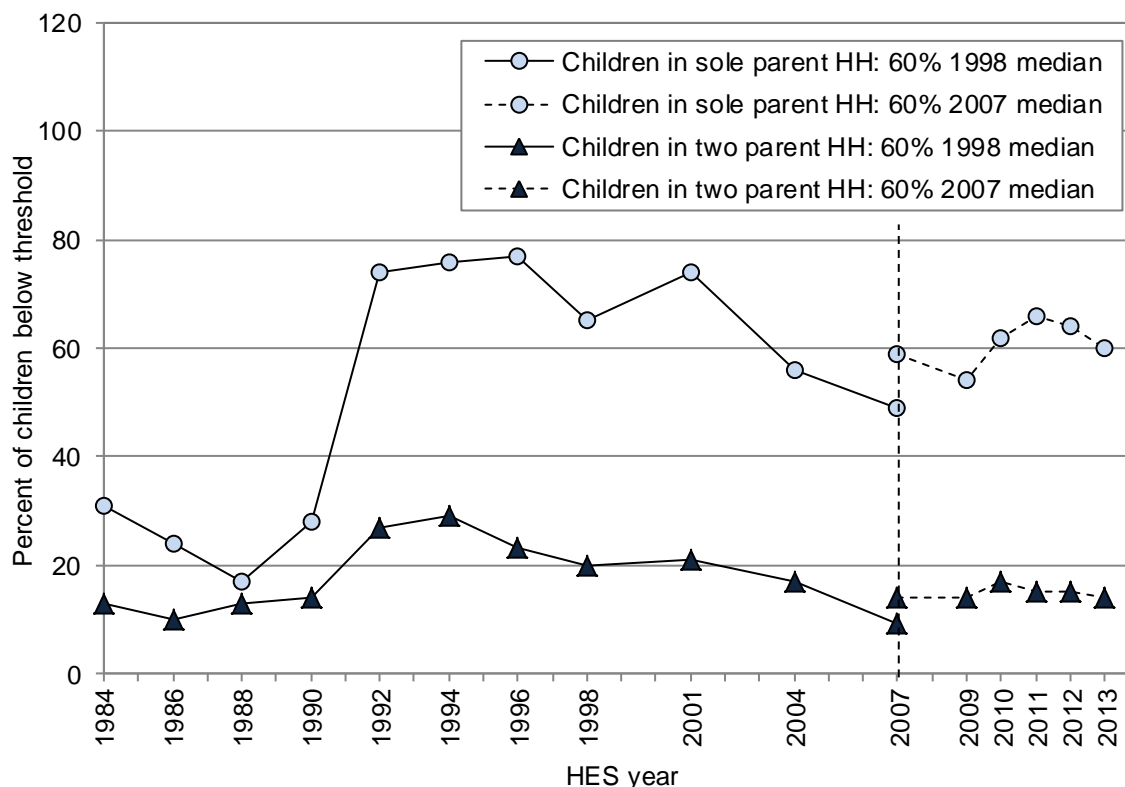
In New Zealand during 1984–2013, child poverty rates for households with three or more children were consistently higher than for those with one or two children (**Figure 16**).

Child Poverty by Family Type

In 2011–2013, on average, 64% of children living in sole parent families were living in poverty compared to 15% of children of two parent families (**Figure 17**). The majority of New Zealand children lived in two parent families (76%) compared to 16% in sole parent families on their own. Perry identified that 53% of children in poverty were in sole parent families and 47% in two parent households [5]. Perry also noted that children living in multi-adult family households have lower poverty rates than those living in sole parent households [5].

Historically, poverty rates for children in both sole parent and two-parent families declined between 2001 and 2007 in New Zealand. In 2007, however, rates for children in sole-parent families remained higher than their 1980s levels while rates for children in two-parent families were similar [5].

Figure 17. Percentage of dependent children aged 0–17 years living below the 60% income poverty threshold after housing costs by household type, New Zealand 1984–2013 HES years



Source: Perry 2014 [5], derived from Statistics New Zealand Household Economic Survey (HES) 1984–2013

Child Poverty by Work Status of Adults in Household

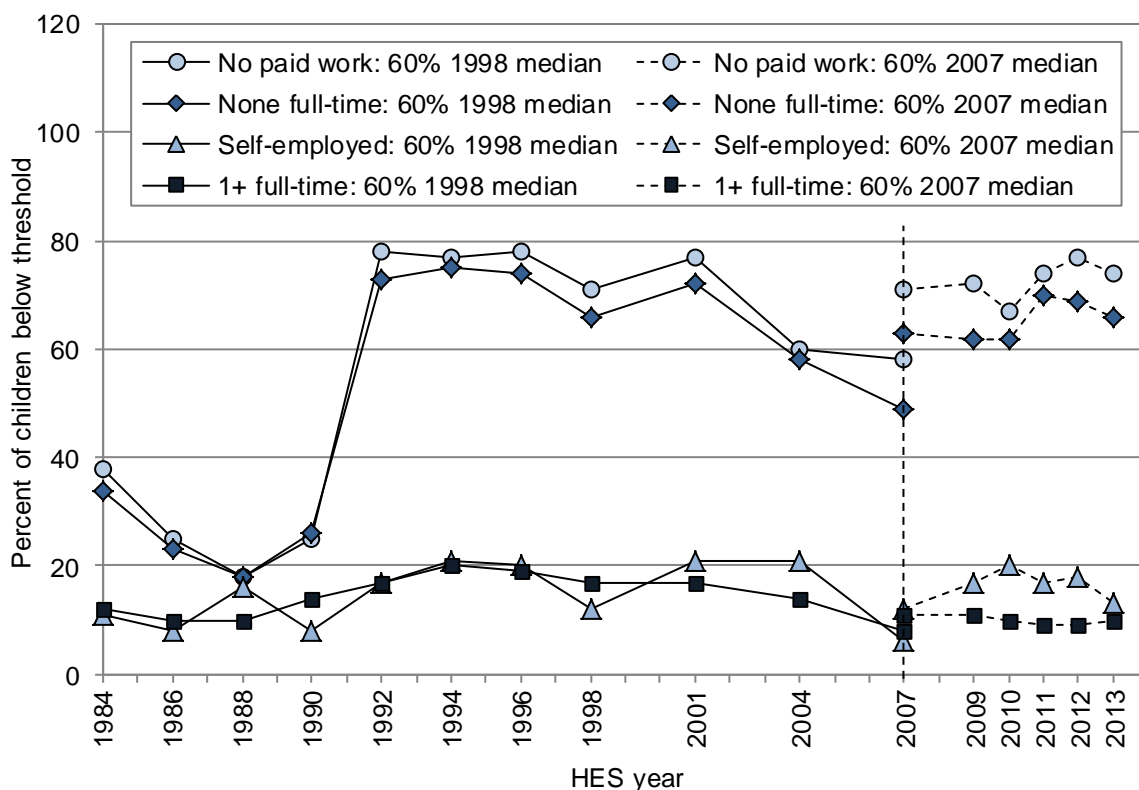
From 2011 to 2013, on average, around 37% children who were living in households below the fixed line <60% median poverty threshold AHC came from working families (down from one in two (52%) in 2004 before Working for Families) while 63% were in families reliant on a benefit income [5].

Perry notes that from 1992 to 2004, children in households with no adults in paid work generally had poverty rates around four times higher than for those in households where at least one adult worked full-time. From 2007 to 2013, the difference was even greater—around six to seven times higher for children in households where no adults were in paid work [5].



Historically in New Zealand, child poverty rates for children in households with no adults in paid work, or where no adults worked full-time, increased rapidly during 1988–1992. Poverty rates for children in these households remained elevated during the 1990s (range 66%–78%), before declining during 2001–2007. Even at their lowest point in 2007, poverty rates for children in these households remained much higher than 1980s levels. In contrast, increases in child poverty for households where an adult worked full-time, or was self-employed, were much less marked, with rates in 2007–2009 being similar to those in the 1980s (**Figure 18**).

Figure 18. Percentage of dependent children aged 0–17 years living below the 60% income poverty threshold after housing costs by work status of adults in the household, New Zealand 1984–2013 HES years



Source: Perry 2014 [5], derived from Statistics New Zealand Household Economic Survey (HES) 1984–2013

Child Poverty by Ethnicity

Over the period 2011–2013, on average, around 34% of Māori children and 28% of Pacific children lived in poor households, compared to an average of 16% of European children (using the AHC 60% fixed-line measure) [5]. The higher poverty rates seen in Māori children potentially reflect the relatively high proportion of Māori children living in sole parent beneficiary households (during 2007 to 2011 around 43% of domestic purpose benefit (DPB) recipients were Māori). On average, during 2011 to 2013, just under half (48%) of children living in poverty were Māori or Pacific, using the AHC 60% fixed line measure [5].

No time series data are available for ethnicity, however, Perry reports that poverty rates for Pacific and Māori children are consistently higher than for European children [5]. Limited analyses by ethnic group are reported in the NZHES [5] because of the relatively small sample sizes for Māori, Pacific and Other ethnic groups.



CHILD POVERTY: MATERIAL HARDSHIP

Introduction

The Ministry of Social Development (MSD) uses non-income measures to assess the material wellbeing of families with children, as well as measures of income poverty. The non-income measures provide insight into what hardship looks like for everyday life by indicating families' actual living standards, including their ability to keep the house warm in winter, to afford meat and fresh fruit and vegetables, to replace worn out shoes and clothing, and broken appliances, and to visit the doctor when they need to [5]. MSD monitors these measures using:

1. The New Zealand Household Economic Survey (NZHES) which contains a 40-item Economic Living Standards Index (ELSI) that ranks households from low to high living standards using a range of non-income measures. A short (25 item) form of the ELSI has been included in the NZHES since 2006–07 [5].
2. Material Wellbeing Index (MWI) which is a new index developed by MSD that uses 13 of the 25 items from ELSI and 11 new ones [5]. This index was first used to collect data on material hardship in 2012–13. There is considerable similarity on the household rankings between ELSI and MWI. The main differences between the MWI and the ELSI are the removal from the MWI of three items previously included in the ELSI that required a high level self-assessment (of income inadequacy, standard of living and satisfaction with standard of living) and the MWI having greater emphasis on material things that households or families have and activities they could participate in.
3. The Living Standards Surveys (LSS), undertaken nationally by MSD in 2000, 2004 and 2008, provided data on households with children and child specific measures. The 2008 survey collected information from 5,000 households on their material circumstances including ownership and quality of household durables, and their ability to keep the house warm, pay the bills, have broken appliances repaired and pursue hobbies and other interests [5]. The details of the 2008 Survey are available from earlier MSD reports [9].

The following section provides the data from the Household Economic Survey (NZHES), and the MWI, which provide insight into children's exposure to hardship. The 2008 Living Standards Survey data have been included for their child specific measures that reflect children's experience of material hardship.

New Zealand Household Economic Surveys

Data Source and Methods

Indicator

1. Proportion of children aged 0–17 years experiencing material hardship

Data Source

New Zealand Household Economic Survey (NZHES) (n=2,800–3,500 households per survey) via Perry 2014 [5].

The MSD developed the 40-item Economic Living Standards Index (ELSI), which ranks households from low to high living standards using a range of non-income measures. A short (25 item) form of the ELSI has been included in the NZHES since 2006–07, with 16 items being used to calibrate a material hardship measure [5]. The MSD has developed the ELSI further with the Material Wellbeing Index (MWI) that retains 13 of the 25 items from the ELSI and adds 11 new ones. These were first collected in HES in 2012–13. The ELSI and MWI rank the population as a whole and the different groups in it in much the same way (correlation of 0.95) [5] and the following 16 items are common to both. There is, however, a discontinuity in the HES-based material hardship measures of 2007–12 (ELSI) and those of 2012–13 (MWI).

Enforced lack of essentials

- Meal with meat, fish or chicken (or vegetarian equivalent) at least each 2nd day
- Two pairs of shoes in good repair and suitable for everyday use
- Suitable clothes for important or special occasions
- A good bed



Economised, cut back or delayed purchases 'a lot' because money was needed for other essentials

- Fresh fruit and vegetables
- Meat
- Replacing worn out clothes
- Put up with being cold
- Visits to the doctor
- Trips to the shops or other local places
- Repair or replace broken or damaged appliances

In arrears more than once in last 12 months, because of shortage of cash at the time

- Rates, electricity, water
- Vehicle registration, insurance or Warrant of Fitness

Financial stress and vulnerability

- Had to borrow from friends or family more than once in last 12 months to cover everyday expenses
- Feel 'very limited' by the money available when thinking about purchase of clothes or shoes for self
- Could not pay an unexpected and unavoidable bill of \$500 within a month without borrowing

The ELSI hardship threshold was set at 6 or more deprivations out of 16 from the calibration list above. This gave a population hardship rate in 2008 of 12%, which was close to the 2008 income poverty rate (using the more stringent 50% of median AHC threshold) of 13%. For further detail on the methodology used see Perry 2014 [5].

Proportion Living in Material Hardship by Age and Household Type

In New Zealand during 2007–2012, material hardship, as defined using the Economic Living Standards Index (ELSI), was consistently highest for households with children aged 0–17 years, followed by one person households aged 45–64 years. The lowest rates of hardship were seen among those aged 65+ years. The proportion of children aged 0–17 years in material hardship in rose from 16% in 2009 to 21% in 2011, before falling to 17% in 2012 (**Figure 19**). In 2012, around 180,000 children were living in material hardship. The Material Wellbeing Index (MWI) and ELSI rank the population in much the same way [5].

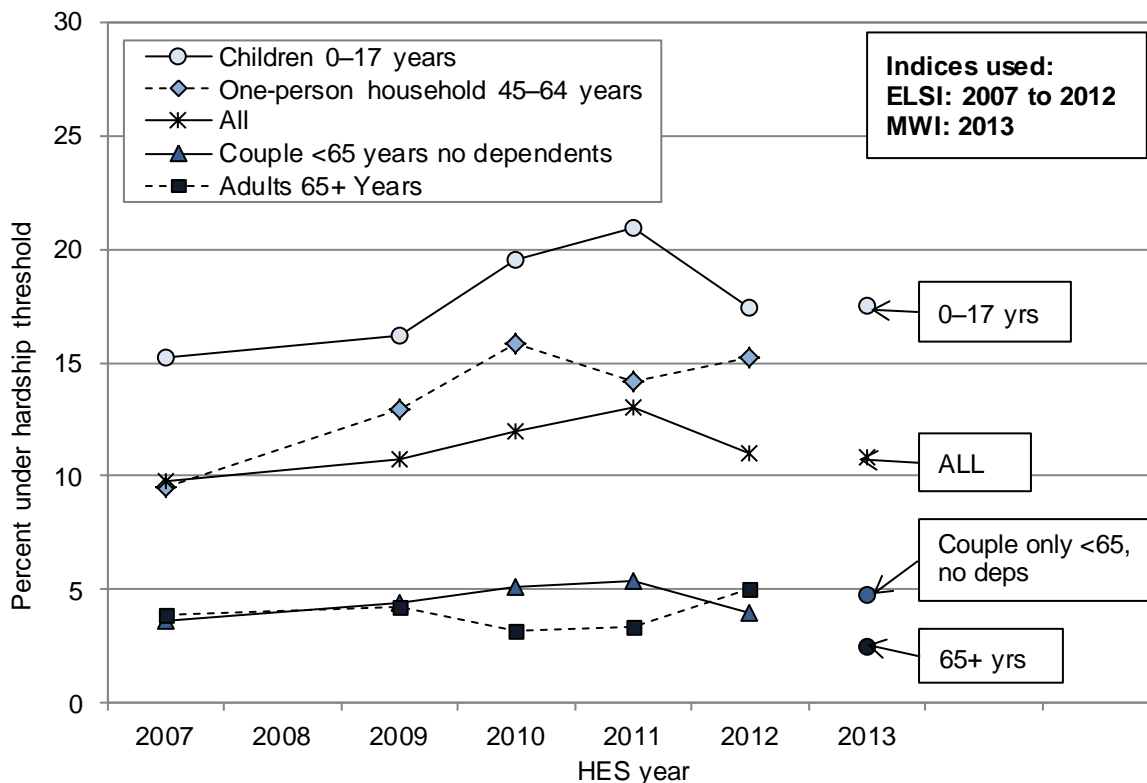
Perry notes that the rise in material hardship from 2007 to 2011 for the total population and for children 0–17 years was not unexpected, given the impact of the Global Financial Crisis and economic downturn, and that the improvements seen between 2011 and 2012 reflect the early impacts of the more recent economic recovery [5] (**Figure 19**).

Proportion of Children Living in Material Hardship by Family Income

During 2007–2012, a lower proportion of children with a family income above the 60% poverty threshold (non income-poor families) lived in material deprivation than did New Zealand children overall. However, material hardship rates rose during 2009–11 both for non income-poor families and for all families. Perry suggests that a number of families with incomes above the 60% threshold may be in relatively precarious financial circumstances, with small drops in income or unexpected bills potentially making a significant difference to their day-to-day living standards [5].



Figure 19. Proportion living in material hardship, for children 0–17 years and selected sub-groups, New Zealand 2007–2013 HES years



Source: Perry 2014 [5] derived from Statistics New Zealand Household Economic Survey (HES) 2007–2013; Note: Hardship defined using Economic Living Standards Index (ELSI) and Material Wellbeing Index (MWI), see Methods for further detail

2008 Living Standards Survey

In the Living Standards Survey, respondents provided information about themselves and others in their economic family unit including information on specifically child related items [9]. In the Living Standards Survey, material hardship was defined as having a score of four or more “enforced lacks” from a list of 14 items on the material deprivation index outlined in the Methods box.

Data Source and Methods

Definition

Proportion of children aged 0–17 years experiencing material hardship

In the 2008 Living Standards Survey [9], respondents provided information about themselves and others in their economic family unit (EFU). A respondent’s EFU comprised the respondent and partner (if any), together with their dependent children in the household (if any). This was a narrower concept than the census family unit which includes other family members such as adult children and parents of adult children. In the survey, total response ethnicity was used, meaning that categories were not mutually exclusive, as one person could be in two or more categories depending on their response.

Deprivation Index Based on Data from the 2008 Living Standards Survey

In the 2008 Living Standards Survey report [9], a 14 item material deprivation index was used to compare the relative positions of different population groups. Each item in the index assessed an ‘enforced lack’, with items being divided into two categories: ownership/participation, where an item was wanted but not possessed because of cost; and economising items, which focused on cutting back or going without in order to pay for other basic needs. The deprivation score for each respondent was the sum of all enforced lacks, with a cut off of 4+ being used as a measure of material hardship, as it represented the 15% of the population experiencing the most hardship (and was thus seen as being equivalent to the MSD’s income poverty measures).

14 items (enforced lacks) are included in 2008 Living Standards Survey Deprivation Index (DEP)*

Ownership/Participation

- A good bed
- Ability to keep main rooms adequately warm
- Suitable clothes for important or special occasions
- Home contents insurance
- Presents for family and friends on special occasions



Economising 'a lot' (to keep down costs to help pay for other basics)

- Continued wearing worn out clothing
- Continued wearing worn out shoes
- Went without or cut back on fresh fruit and vegetables
- Bought cheaper or less meat than wanted
- Postponed visits to the doctor
- Did not pick up a prescription
- Put up with feeling cold to save on heating costs
- Went without or cut back on visits to family or friends
- Did not go to a funeral (tangi) you wanted to

** A DEP score is not to be confused with NZDep categories*

Proportion of Children Experiencing Material Hardship

Table 7 provides an overview of the distribution of children by their family's deprivation scores (DEP) according to items included in the Living Standards Survey. Additional child specific items not included in the calculation of the DEP score have been listed to highlight experiences of children living in households with differing experiences of material deprivation. It suggests that 22% of children lived in families experiencing four or more enforced lacks (10% had a DEP Score of 4–5 and 12% had a DEP score of 6+).

When broken down by individual item, those children experiencing material hardship (i.e. living in households with DEP scores of four or more) were exposed more to household economising behaviours such as having to wear worn out shoes or clothing, sharing a bed or bedroom, cutting back on fresh fruit and vegetables and postponing doctor's visits because of cost. For example, 39% of children whose families had a DEP score of 6+ continued to wear worn out shoes or clothing, while 58% had major difficulty keeping the house warm in winter (**Table 7**).

Proportion of Children Experiencing Material Hardship by Ethnicity and Family Income

In the 2008 Living Standards Survey, 51% of Pacific children, 39% of Māori children, 23% of "Other" children and 15% of European children aged 0–17 years were in families experiencing material hardship (i.e. scored four or more on a composite deprivation index measuring a range of "enforced lacks", as outlined in the Methods box above). In addition, 59% of children whose family's income source was a benefit experienced material hardship (**Figure 20**).



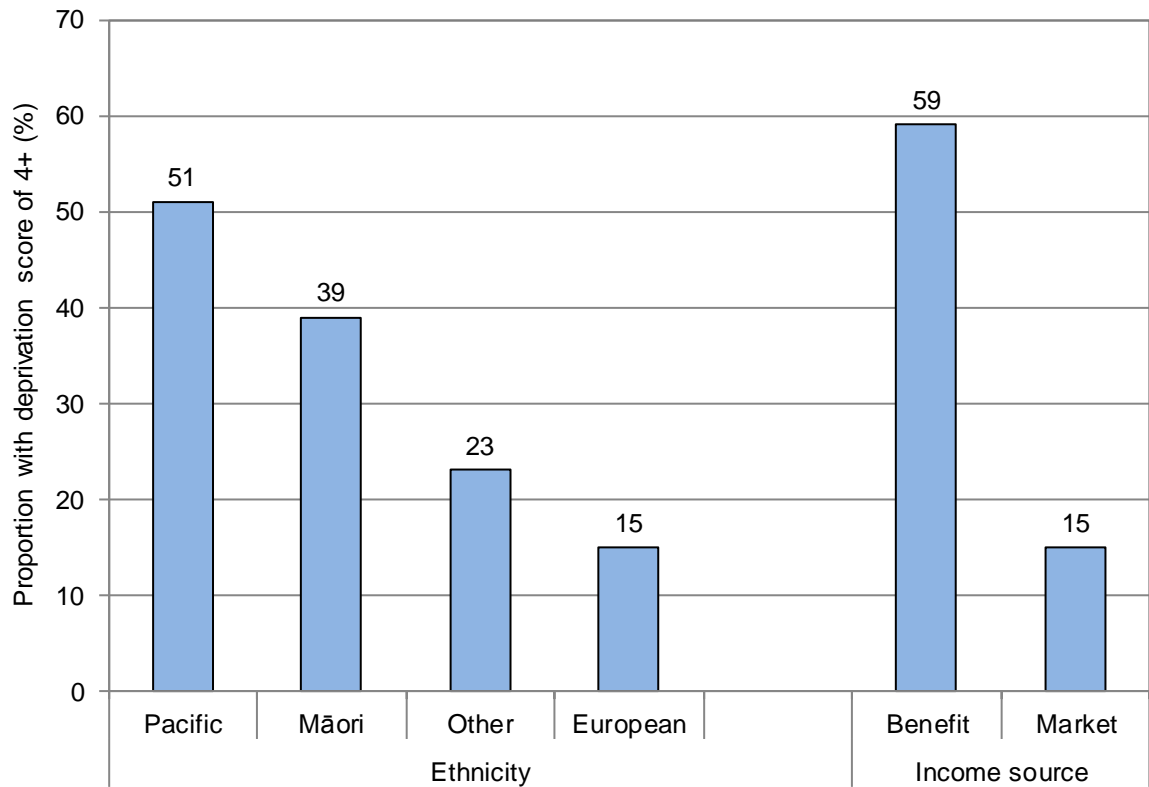
Table 7. Restrictions experienced by children by the deprivation score of their family (DEP score), from the New Zealand Living Standards Survey 2008

	All#	DEP score				
		0	1	2-3	4-5	6+
Distribution of children across the DEP scores (%)	100	41	18	18	10	12
Average number of children per family		2.2	2.3	2.5	2.7	2.7
Enforced lacks of children's items						
Friends to birthday party*	6	-	-	5	9	31
Waterproof coat	8	-	2	8	11	39
Separate bed	5	-	-	3	13	20
Separate bedrooms for children of opposite sex (10+ yr)*	8	2	3	6	14	24
All school uniform items required by the school	5	-	-	2	9	19
Economising 'a lot' on children's items to keep down costs to afford other basics						
Children continued to wear worn out shoes/clothes	8	-	-	5	15	39
Postponed child's visit to doctor	2	-	-	-	5	13
Did not pick up prescription for children	1	-	-	-	3	7
Unable to pay for school trip*	3	-	-	-	6	17
Went without music, dance, kapa haka, art etc*	9	2	4	8	18	37
Involvement in sport had to be limited*	8	-	4	6	17	32
Multiple deprivation						
4+ of the 11 children's items above	6	-	-	2	11	35
5+ of the 11 children's items above	4	-	-	-	7	29
6+ of the 11 children's items above	3	-	-	-	2	24
Children's serious health problems reported by respondent						
Serious health problems for child in the last year*	28	22	25	31	35	43
Enforced lacks reported by respondent in child's family						
Keep main rooms warm	9	-	3	8	18	37
Meal with meat/chicken/fish at least each second day	3	-	-	-	6	18
Cut back/did without fresh fruit and vegetables	14	-	-	15	32	63
Postponed visit to doctor	14	-	4	18	38	65
One week's holiday away from home in last year*	33	14	28	42	52	73
Home computer*	8	3	6	8	13	25
Internet access*	9	-	7	9	18	28
Housing and local community conditions						
Physical condition of house (poor/very poor)*	7	-	3	7	15	28
Major difficulty to keep house warm in winter	22	9	13	27	38	58
Dampness or mould (major problem)*	17	5	13	18	37	49
Crime or vandalism in the area (major problem)*	11	6	6	11	13	31

Source: NZ 2008 Living Standards Survey [9]; Note: Only those items mentioned in the Methods box are included in the calculation of DEP Scores. This table includes a number of additional child specific items (marked *) which were not included in the calculation of the DEP Index as they did not relate to all family types. These additional items have been included here in order to highlight the experiences of children living in households with differing experiences of material deprivation. # 'All' refers to all children aged 0-17 years



Figure 20. Percentage of children aged 0–17 years experiencing material hardship* by ethnicity and by family income source, NZ Living Standards Survey 2008



Source: NZ 2008 Living Standards Survey [9]; Notes: * Material Hardship defined as scoring four or more “enforced lacks” on the material deprivation index as outlined in the Methods box. Ethnicity is total response



CHILD POVERTY: SEVERITY AND PERSISTENCE

The timing, duration and severity of poverty during childhood have been identified in research as influencing longer term outcomes for children. In general, those experiencing poverty early or for prolonged periods have been shown to have worse outcomes than those exposed to poverty only during adolescence, or for shorter periods of time [10,11]. Further, the duration of income poverty also influences the severity of material deprivation. Analysis of the data from Statistics NZ's Survey of Family Income and Employment (SoFIE) indicates significant correlations between the length of time spent on a low income, and levels of material deprivation [12].

In 2012 the Office of the Children's Commissioner's Expert Advisory Group on Child Poverty recommended that the Government monitor the severity and persistence of poverty for families with children [3]. Measures of poverty persistence and severity are much less developed than the headline income poverty and material deprivation measures. The Household Economic Survey (HES) provides data on a cross section of households showing poverty over time. However, different sets of households are included in each survey, so there is no continuity and the survey cannot provide information on how many of the households who were poor in one survey are still poor in the subsequent survey [5].

A number of measures are available to assess the depth and severity of poverty but these are not updated regularly [5]:

- The ratio of the number below the 50% line to the number of those below the 60% line (the higher the ratio, the greater the depth of poverty).
- Median poverty gap ratio, defined as the ratio of the gap between the poverty threshold and the median income of those below the threshold with the threshold itself.
- The total poverty gap that measures the total resources (\$m) required to bring all those identified as poor to just above the poverty line via targeted tax transfers.

The quality of HES data for households with very low incomes is a concern, according to Perry, and may have a detrimental impact on the robustness of measures of poverty depth [5].

The Statistics NZ's longitudinal Survey of Family, Income and Employment (SoFIE) that ran between 2002 and 2009 has provided a range of reasonably robust measures of poverty persistence [5] but no further updates are planned.

Given their significant influence on long term outcomes for children, despite the limitations in the data, poverty severity and persistence need to be monitored. In the absence of more robust measures, or in the case of persistent poverty more up to date data, the following sections present two proxy indicators that capture different aspects of the severity and duration of child poverty in New Zealand.

Poverty Severity

- The proportion of children living in households below the 50% income poverty threshold, as measured using HES data [5].
- The proportion of children living in households who were both income poor and experiencing material deprivation, as measured using HES data [5].

Poverty Persistence

- The proportion of children exposed to chronic low income, as measured using data from Statistics New Zealand's Longitudinal Survey of Families, Income and Employment (SoFIE) up until 2009 [5,13].



It is hoped that in time, these proxy indicators will be replaced by more robust measures, which better capture the severity and persistence of poverty for New Zealand children.

Poverty Severity

Data Source and Methods

Indicator

1. Proportion of children aged 0–17 years who are both income poor and materially disadvantaged
2. Proportion of children aged 0–17 years living below the 50% income poverty threshold before and after housing costs

Data Source

New Zealand Household Economic Survey (NZHES n=2,800–3,500 households per survey) via Perry 2014 [5]. Note: Child Poverty measures are reported on by the Ministry of Social Development using NZHES data with data being reported on 2-yearly from 1982–1998 and 3-yearly thereafter. Since 2007, income data have been reported annually using the new HES Incomes Survey. The full NZHES (including expenditure data), however, remains 3-yearly. For more detail on methodology see Perry 2014 [5].

Interpretation

The <50% relative poverty measure is based on a poverty benchmark (50% of the median income) that rises and falls with changes in national median incomes (i.e. poverty is defined in relation to the incomes of others in the same year).

For further detail see Perry 2014 [5].

Children in Income-poor Households Experiencing Material Hardship

One approach to assessing the severity of child poverty in the absence of more robust measures, is to identify children living in households that are both income poor and experiencing material hardship. Perry notes that living above the poverty threshold reduces the risk of material hardship, but does not remove it. Those in hardship with incomes above the poverty line may have some expectation of living standards improving. For those in hardship and who also have low incomes, there is little chance of an improvement unless their income increases and stays up [5].

Figure 21 shows the proportion of those who are both income poor and materially disadvantaged for the population as a whole and for households with children [5].

Children in Households with Incomes less than 50% of Contemporary Median

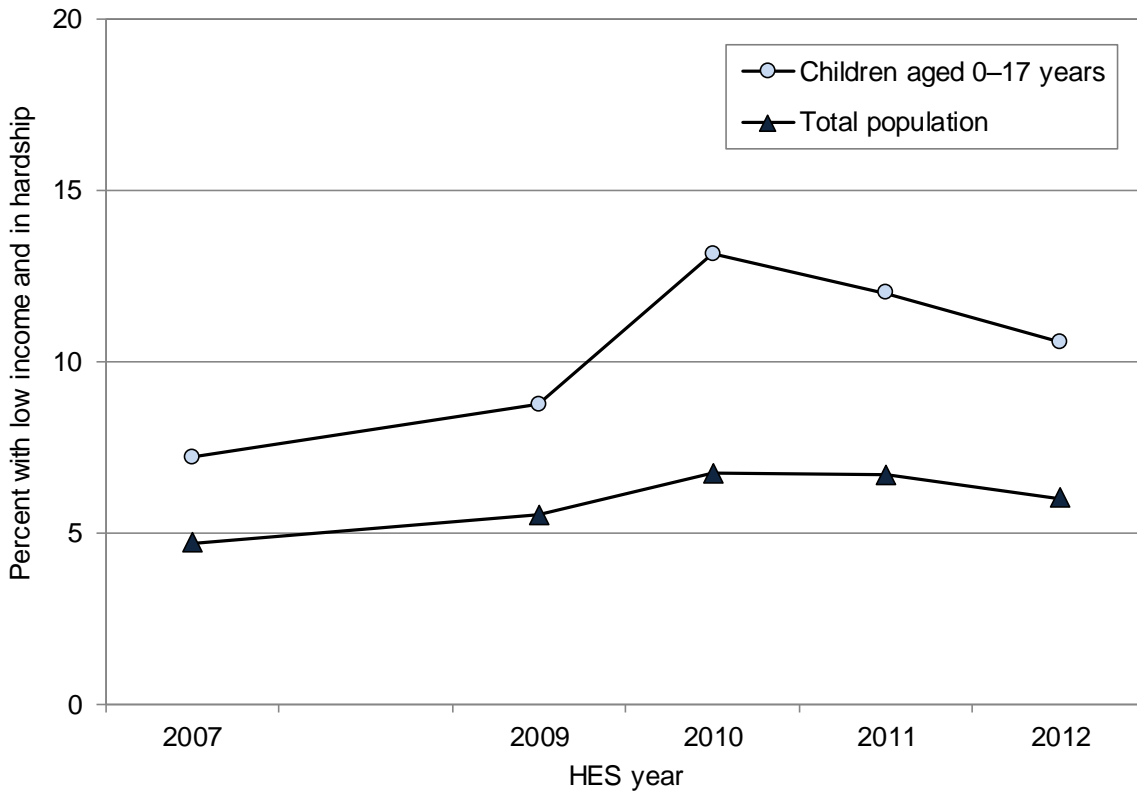
A second approach to assessing the severity of child poverty in the absence of more robust measures, is to select an income threshold lower than the traditional 60% cut-off. Where all else is the same, children in households with incomes below the 50% moving line threshold, will experience greater material disadvantage than those just below the 60% threshold.

Figure 22 reviews the proportion of children aged 0–17 years living in households with incomes below 50% of the contemporary median, before (BHC) and after (AHC) adjusting for housing costs. Using the <50% poverty measure, during the 1980s the proportion of children living in poverty was similar before and after adjusting for housing costs. However, from 1992 onwards, child poverty rates were much higher after adjusting for housing costs, with the most rapid rises in child poverty between 1990 and 1994 being seen when the AHC measure was used. While child poverty rates in 2012 were similar to those in the early 1980s using the BHC measure, when the AHC measure was used, rates remained much higher than those in the 1980s.

An increase in child poverty (<50% AHC measure) was also evident between 2007 and 2011. In 2012, 20% of children were living in severe poverty (**Figure 22**) with a slight drop to 19% in 2013.

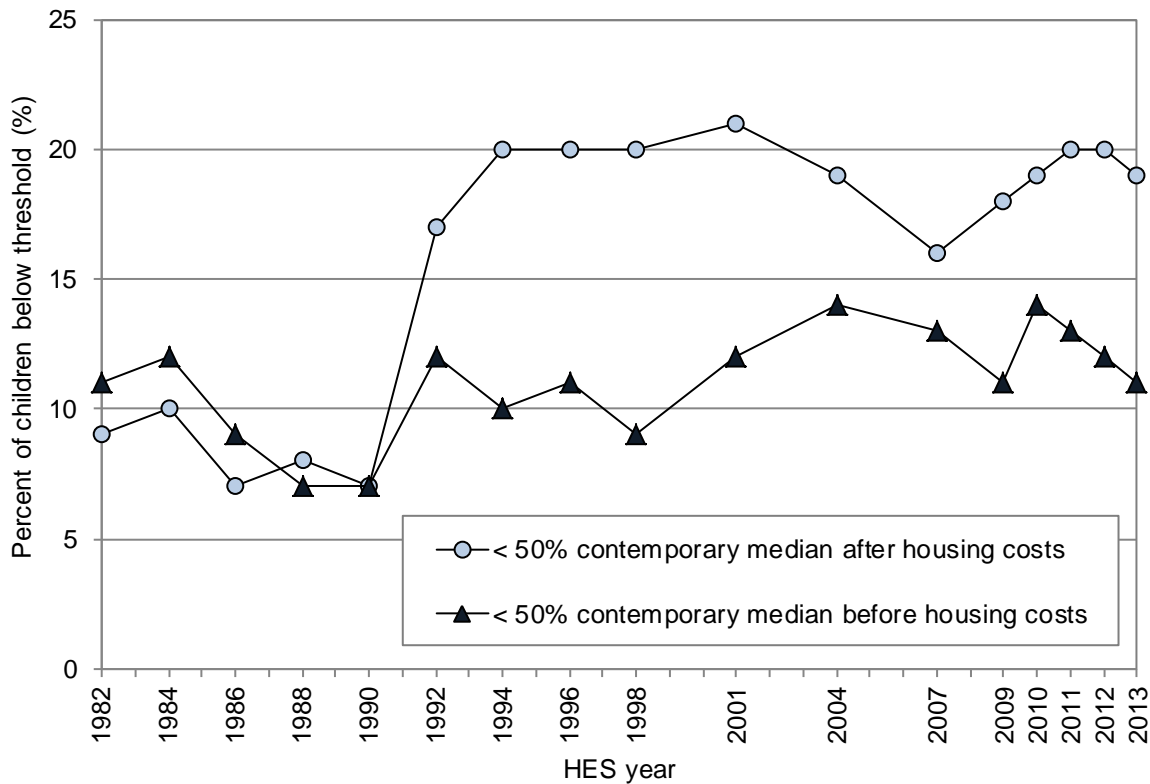


Figure 21. Trends in the percentage of those who are both income poor and materially deprived, New Zealand 2007–2012 HES years



Source: Perry 2014 [5] derived from Statistics NZ Household Economic Survey (HES) 2007–2012

Figure 22. Percentage of dependent children aged 0–17 years living below the 50% of median income poverty threshold, New Zealand 1982–2013 HES years



Source: Perry 2014 [5] derived from Statistics NZ Household Economic Survey (HES) 1982–2013



Poverty Persistence

The child poverty measures in the previous section were based on data from the Household Economic Survey (HES), this survey samples a different set of households in each survey, so it is not possible to explore poverty persistence at the household level using HES data. However, Statistics NZ's Survey of Family, Income and Employment (SoFIE) that began in October 2002, followed the same group of individuals and has longitudinal data available for seven years, from 2002–03 to 2008–09 [5].

The following section uses SoFIE data to show the proportion of children who in 2002–03 were aged 0–17 years (living below 60% gross median threshold) or 0–11 years (living below the 50% gross median threshold) and who experienced persistent poverty (i.e. an average family income below the low income threshold) across the seven years.

Data Source and Methods

Definition

1. Proportion of children aged 0–17 years (using 60% gross median threshold) in year one of Statistics New Zealand's Survey of Family, Income and Employment (SoFIE) who were exposed to persistent poverty
2. Proportion of children aged 0–11 years (using 50% gross median threshold) in year one of Statistics New Zealand's Survey of Family, Income and Employment (SoFIE) who were exposed to persistent poverty

Data Source

Statistics New Zealand's Survey of Family, Income and Employment (SoFIE)

The information in this section is drawn from Perry's 2014 Household Incomes Report [5], which is based on the analysis of SoFIE data published by Carter and Imlach Gunasekara (2012) [13] and some otherwise unpublished data provided to Perry by Carter and Imlach Gunasekara.

Interpretation

The initial SoFIE sample in 2002–03 included around 11,500 households with almost 30,000 respondents (22,000 being aged 15+ years). In the final year of SoFIE (2008–09), just under 14,000 adults (aged 15+ years) were left. The overall attrition rate (63% remaining after seven years) is comparable to similar international longitudinal surveys. In this analysis, SoFIE participants who were eligible in the first year (2002–03) and who responded in all seven survey years have been included, giving a sample of just under 19,000.

Persistent Poverty: In this analysis, participants' average income over the seven years was compared with an average low income (poverty) line over the same period. People whose average income across all seven years was below the average low income (poverty) line were said to be in persistent poverty. As income was averaged across all seven years, participants may have been above the income poverty line in some years, but still classified as being in persistent poverty [5].

Current Poverty: Participants were considered to be in current poverty if they fell below the income poverty line for which ever survey year was under review [5].

Note: In this analysis the poverty benchmarks used are based on 50% and 60% of gross income. This is different to the benchmarks used in the earlier income poverty section which are based on 60% of disposable income. Perry [5] notes that the two 60% benchmarks are not comparable (due to differences in the methodology used), and that where comparisons are required, that the 50% gross is the most appropriate, as it is closer to the usual poverty figures reported (60% median disposable income).

Proportion in Current and Persistent Income Poverty

<60% Gross Median Threshold

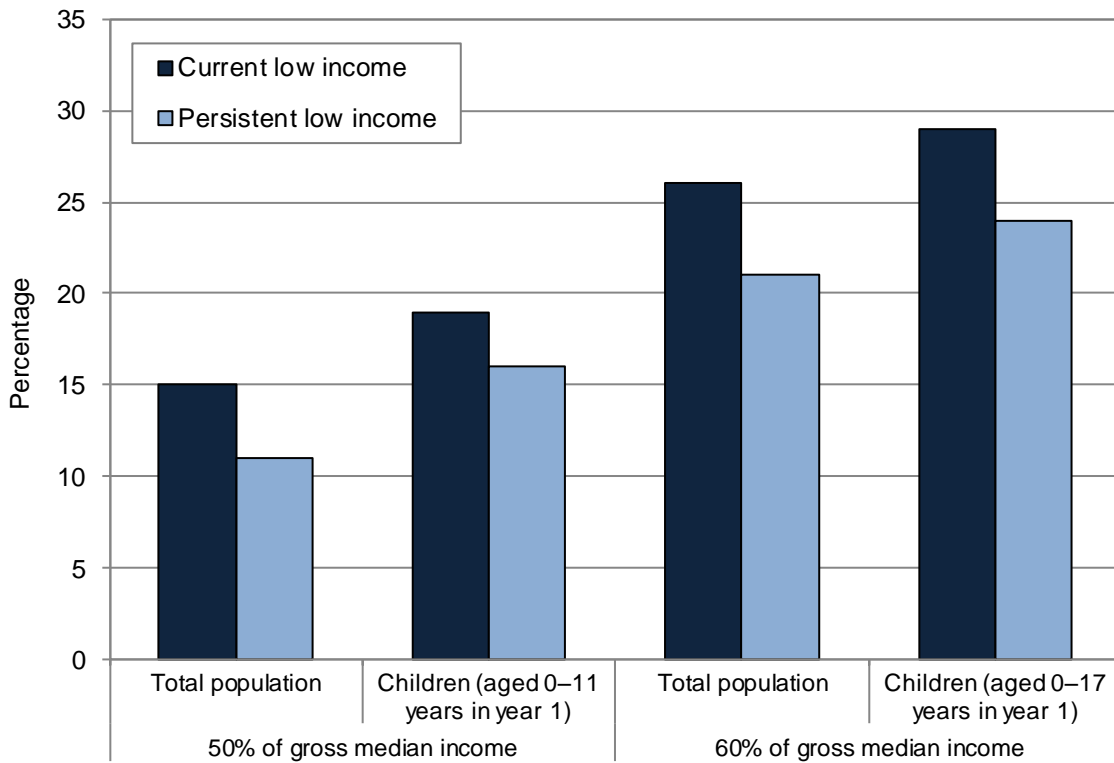
Of the children who were aged 0–17 years in the first year of SoFIE (2002–03), 24% lived in households experiencing persistent poverty (i.e. an income which, when averaged across all seven years, was below 60% of the gross median) and 29% were deemed to be in current poverty (i.e. with an income below 60% of the gross in the year under review) (**Figure 23**). The reason for this difference is because in any given year, those in poverty comprise a mix of those who have transiently moved into poverty and moved out in later surveys, and those who were living in long term poverty.



<50% Gross Median Threshold

When the threshold used is 50% of the gross median income, 16% of children who were aged 0–11 years in the first year (2002–03) were deemed to be in persistent poverty and 19% in current poverty (**Figure 23**). Perry [5] notes that in any one year, 60% of those in current poverty were also in persistent poverty (using the 50% gross median threshold). There was also a further group of children who, although not in poverty in the current year, were in persistent poverty when their households' incomes were averaged over the seven survey years.

Figure 23. Percentage of children with current and persistent low incomes, Statistics New Zealand's Survey of Family, Income and Employment (SoFIE) 2002–2009



Source: Perry 2013 [14] derived from Statistics NZ's Survey of Family, Income and Employment 2002–2009



OTHER MACROECONOMIC INDICATORS



GROSS DOMESTIC PRODUCT

Introduction

The gross domestic product (GDP) is often used as a measure of the size of a nation's economy, with nominal GDP being expressed in current dollar prices, and real GDP being expressed in constant dollar prices (i.e. the dollar value of a particular year, after adjustment for inflation). Changes in real GDP are often used as a measure of economic growth, or the strength of the economy [15] with a recession typically being defined as two consecutive quarters of negative growth [16].

The following section briefly reviews quarterly changes in New Zealand's GDP since March 2006 before considering the share of economic growth that has been passed on to workers from 1975–2014.

Data Source and Methods

Indicator

1. *Gross Domestic Product (GDP): Percent change from previous quarter*
2. *Real per capita gross domestic product (RPC-GDP)*
3. *Real ordinary time average hourly earnings (ROT-AHE)*

Data Sources

1. *Gross Domestic Product (GDP): Percent change from previous quarter*

Source: Statistics New Zealand: The New Zealand System of National Accounts (produced quarterly)

GDP is the total market value of all final goods and services produced in a country in a given year equal to total consumer, investment and government spending, plus the value of exports, minus the value of imports. Three approaches can be used to calculate GDP. Short term-quarter on quarter monitoring traditionally uses the production approach which calculates what each separate producer adds to the value of final output by deducting intermediate consumption from gross output. Value-added is summed for all producers. Expenditure based approaches can also be used but they have historically shown more quarterly volatility and are more likely to be subject to timing and valuation problems [17]

2. *Real per capita gross domestic product (RPC-GDP)*

Real GDP is adjusted for changing prices and reflects the extent to which growth in the value of goods and services is due to increased production rather than an increase in the absolute value of the goods and services produced [18]. Per capita real GDP divides the national GDP by the population.

Numerator:

Base series 1975–1987Q1 from [19] and supporting web page <https://sites.google.com/site/eaqubs/> NZ Economy tables and graphs (27 July 2014). The authors sourced the GDP data from the following: 1975–1977: Hall and McDermott (2009) [20]; 1977–1987: Statistics NZ, SNBQ.S2SZT. Base series 1987Q2–current: Statistics NZ SND103AA. All these GDP data were re-expressed in March 2014 prices using a constant ratio based on the ratio of the nominal and real values in the March 2014 quarter.

Denominator:

Population series from [19] and supporting web page <https://sites.google.com/site/eaqubs/> NZ Economy tables and graphs (27 July 2014). The authors sourced the population data from the following: 1934–1991: Statistics NZ, de facto population, DPEQ.SBEC; 1991–current: Statistics NZ, resident population DPEQ.SDAC.

3. *Real ordinary time average hourly earnings (ROT-AHE)*

ROT-AHE represent the number of hours usually worked and the usual income in a reference week. Average hourly earnings data are available split by ordinary time, overtime and total (ordinary time plus overtime). As with real GDP, real average hourly earnings are adjusted for changing prices. Average hourly earnings are calculated from the Quarterly Employment Survey (QES) which is a sample of approximately 18,000 business locations selected from a population of economically significant enterprises in surveyed industries, weighted to represent the number of employees in each industry sourced from the Business Register. Certain industries, including agriculture and aquaculture are not included in the QES [21,22].

An ordinary time average hourly earnings series was compiled from the following Statistics NZ sources:

1987–2014—Average hourly earnings QEX001AA

1980–1986—Average hourly rates, all sectors EMP013AA

1975–1979—Average hourly earnings index ERN001AA was used to calculate back from EMP013AA data.

While the different data series used to develop a composite AHE data set may have had different underlying methodologies, this is not likely to have a significant effect on the overall pattern of quarterly change in AHE.

The composite AHE data set was adjusted for changing prices using the Statistics NZ Consumer Price Index quarterly data rebased to March 2014 prices.



Notes on Interpretation

The important comparison in the section on RPC-GDP and ROT-AHE is the quarterly percentage change in each variable rather than the absolute monetary value. The graph axes have been scaled to make it easier to compare the relative changes in each variable over time.

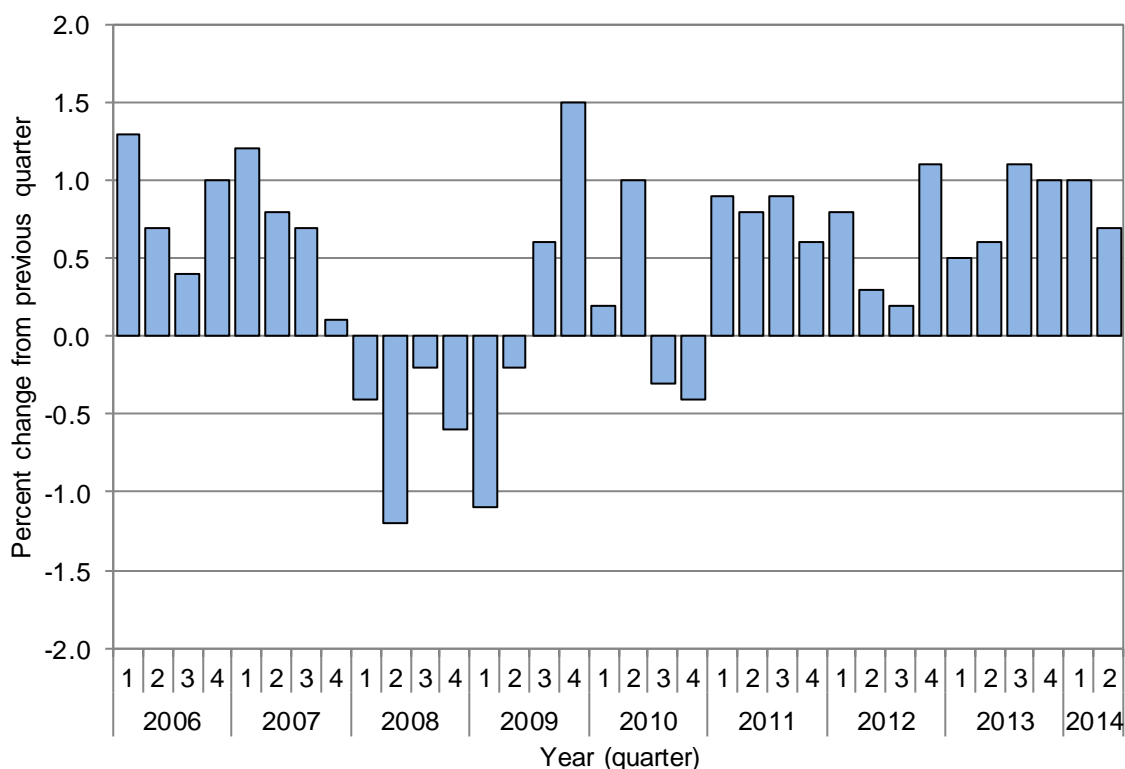
New Zealand Trends

Quarterly Changes in Production-Based Measure of GDP

In New Zealand, GDP decreased for six consecutive quarters from March 2008 to June 2009, before increasing again, for four consecutive quarters, from September 2009 to June 2010. GDP then decreased for two quarters, before increasing again, for 14 consecutive quarters from March 2011 to June 2014. GDP grew by 0.7% in the June quarter of 2014 (**Figure 24**). Economic activity for the year ending June 2014 increased by 3.5%, when compared to the year ending June 2013 [23].

During the June 2014 quarter, business services (up 4.2%) was the main driver of growth. Agriculture, forestry and fishing (down 2.8%) partly offset the growth [23].

Figure 24. Gross Domestic Product (GDP): percentage change from previous quarter, New Zealand March quarter 2006 to June quarter 2014

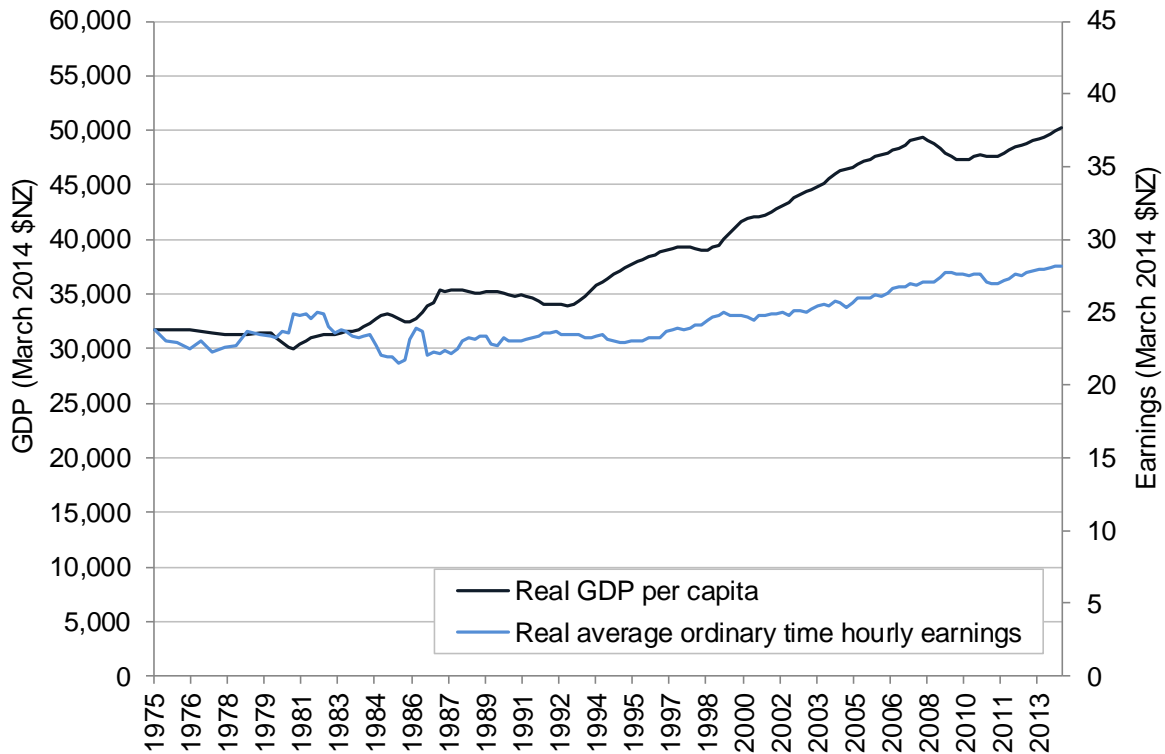


Source: Statistics New Zealand; Note: Seasonally adjusted chain volume series expressed in 1995/96 prices

Trends in real GDP and average hourly earnings

In New Zealand real GDP per capita increased 60% from \$31,426 in the March quarter of 1975, to \$50,261 in the March quarter of 2014, while real average ordinary time hourly earnings only increased 18% from \$23.81 to \$28.18 during the same period (**Figure 25**).

Figure 25. Real Gross Domestic Product (GDP) per capita and real average ordinary time hourly earnings, New Zealand March quarter 1975 to March quarter 2014



Source: Lattimore and Equb 2011 [19] and Statistics New Zealand; Note: Figures are expressed in March 2014 \$NZ



INCOME INEQUALITY

Introduction

Inequality and poverty are two different concepts. Perry describes them thus: “Inequality is essentially about the gap between the better off and those not so well off (on whatever measure)—it is about having ‘less than’ or ‘more than’. Poverty is about household resources being too low to meet basic needs—it is about ‘not having enough’ when assessed against a benchmark of ‘minimum acceptable standards’.” (Perry, 2014, p16.)

There has been much debate regarding the influence of income inequality on population health. The World Health Organization’s Commission on Social Determinants of Health noted that “the structural determinants and conditions of daily life constitute the social determinants of health and are responsible for a major part of health inequities between and within countries” [24]. Research has shown that people with higher socioeconomic position in society have more chance of experiencing better health. For example, Wilkinson and Marmot [25] cite the Whitehall studies of British civil servants that found that mortality increased in a stepwise manner as relative socioeconomic status decreased, and that social gradients were evident even amongst those who were not poor [25]. In addition, they note that while health inequalities exist within societies, there is little association between average income (as measured by GDP per capita) and life expectancy across rich countries. Rather, there appears to be a strong correlation between income inequality and mortality.

More recently the authors of “Fair Society, Healthy Lives” identified health inequalities as arising from inequalities of income, education, employment and neighbourhood circumstances. The team argues that these inequalities are unfair but they are not inevitable [26]. The review does not present income inequalities as the only reason for health inequality but concurs with the view that income inequalities affect the lives people can lead [27]. For example, in England life expectancy in the poorest neighbourhoods is, on average, seven years less than in rich areas. In addition, people in the poorest areas are likely to have, on average, 17 fewer disability-free years than those in the richest neighbourhoods. Similar relationships can be found for indicators in education, occupation and housing conditions [26].

The following section explores income inequalities in New Zealand since 1982 using two different measures, the P80/P20 Ratio and the Gini Coefficient.

Data Source and Methods

Indicator

1. Income Inequality as measured by the P80/P20 Ratio
2. Income Inequality as measured by the Gini Coefficient

Data Source

Statistics New Zealand Household Economic Surveys (NZHES n=2,800–3,500 households per survey) via Perry 2014 [5]

Note 1: The P80/P20 Ratio and Gini coefficient are monitored by the Ministry of Social Development using NZHES data which was available 2-yearly from 1982 to 1998, and 3-yearly thereafter. Since 2007, income data has become available annually through the new NZHES Incomes Survey. The full NZHES (including expenditure data) however remains 3-yearly. For more detail on the methodology used see Perry 2014[5].

Notes on Interpretation

P80/P20 Ratio: The P80/P20 ratio is often used as a measure of income inequality. It is calculated by ranking individuals by equivalised household income and dividing into 100 equal groups. Each group is called a percentile. If ranking starts with the lowest income, the income at the top of the 20th percentile is denoted P20 and the income at the top of the 80th percentile is called P80. The relationship between income value at the 80th percentile and the income value of the 20th percentile is called the P80/20 ratio. In general, the higher the ratio, the greater is the level of inequality [5] so a P80/20 ratio of 3.0 indicates that those at the top of the 80th percentile have incomes three times higher than those at the top of the 20th percentile.

Gini Coefficient: The Gini coefficient is another common measure of inequality used internationally. It gives a summary of income differences between individuals in the population. When the Gini coefficient = 0, all people have the same level of income. When it approaches 1, one person receives all the income. It is an overall measure of income inequality as the higher the value, the greater the level of inequality. The Gini coefficient is



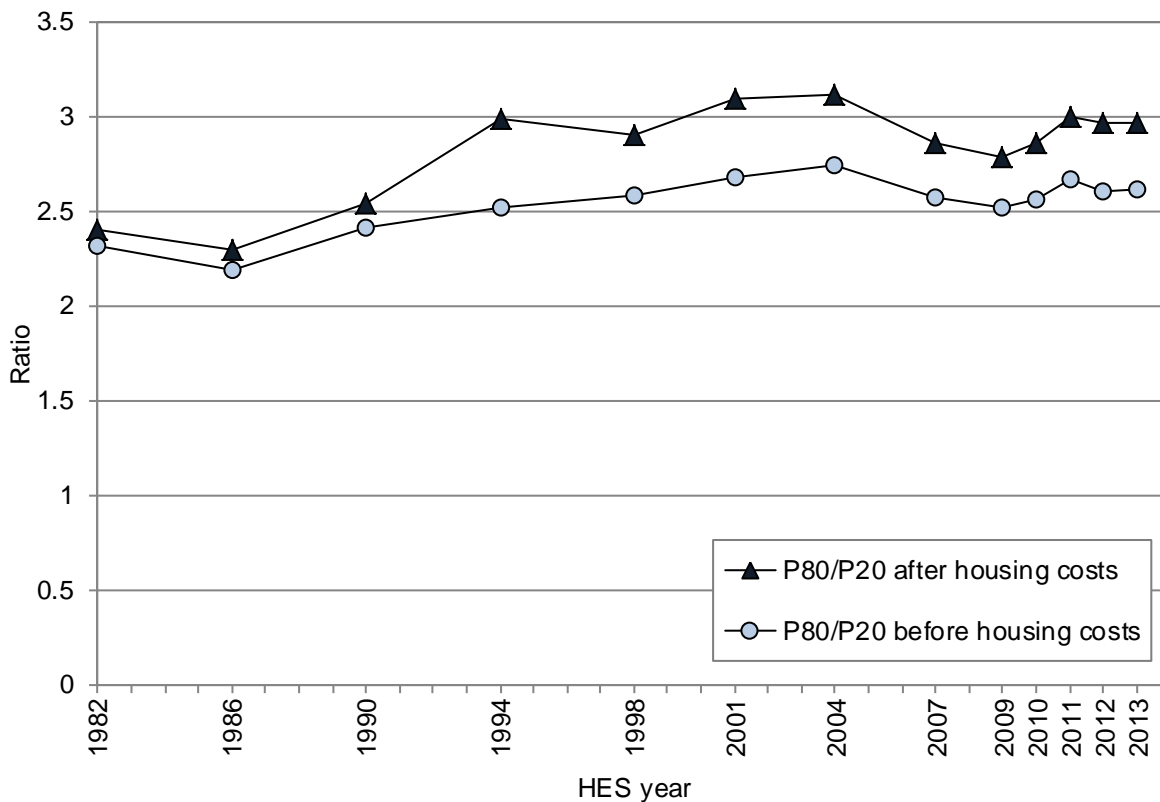
often reported as a percentage so scores range between 0 and 100. [28]. When comparing changes in income distributions over time, the Gini coefficient is more sensitive to changes in the more dense low-to-middle parts of the distribution, than it is to changes towards the ends of the distribution [5]. For more detail on calculating the Gini coefficient see The World Bank [29].

New Zealand Trends

Income Inequality: P80/P20 Ratio

In New Zealand during 1982–2013 income inequality, as measured by the P80/P20 ratio, was higher after adjusting for housing costs than before housing costs. Housing costs generally make up a greater proportion of household income for households on lower incomes than those on higher incomes. The most rapid rises in income inequality occurred during 1988–1992. While income inequality also rose during 1994–2004, the overall rate of increase was slower. During 2004–2007, income inequality fell, a decline that Perry attributes to the Working for Families package. The impact of the economic downturn and global financial crisis during 2009–2011 led to an increase in inequality, although Perry notes that it may take one or two further surveys before the post-crisis inequality level becomes clear [5] (**Figure 26**).

Figure 26. Income inequality in New Zealand as assessed by the P80/P20 ratio for the 1982–2012 HES years



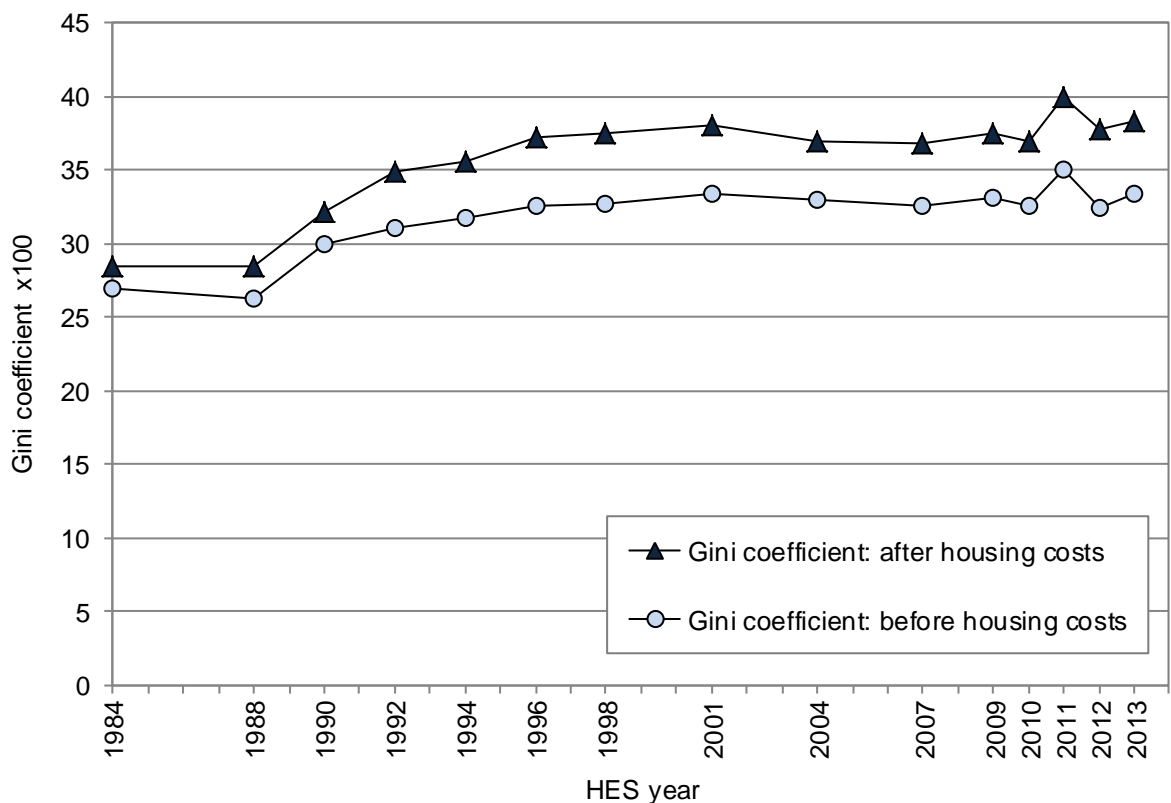
Source: Perry 2014 [5], derived from Statistics NZ Household Economic Survey (HES) 1982–2013



Income Inequality: Gini Coefficient

In New Zealand during 1984–2013 income inequality, as measured by the Gini coefficient, was higher after adjusting for housing costs, for the same reasons as given above. The most rapid rises in income inequality also occurred between the late 1980s and early 1990s. Using both the before and after housing cost measures, the Gini Coefficient declined slightly between 2001 and 2007, a decline which Perry attributes to improving employment and the impact of the Working for Families package. During 2009–2013, however, there was considerable volatility in the Gini coefficient, which Perry attributes to the differing size and timing of the impact of the global financial crisis, Christchurch earthquakes and the associated economic downturn and recovery on different parts of the income distribution. While Perry notes it may take one or two more surveys to see where the inequality trend will settle, he also notes that the overall trend line for this period was flat [5] (Figure 27).

Figure 27. Income inequality in New Zealand as assessed by the Gini coefficient for the 1984–2013 HES years



Source: Perry 2014 [5] derived from Statistics NZ Household Economic Survey (HES) 1984–2013

UNEMPLOYMENT RATES

Introduction

Over the last year or two, the unemployment rate has been falling from its high of 7.4% in the second and third quarters of 2012. The seasonally adjusted employment rate for the June 2014 quarter was 5.6%, the lowest it has been since the March 2009 quarter [30]. Unemployment rates are higher for young people and for Māori and Pacific Peoples (compared to European people). Some, but not all, of the higher unemployment rates for Māori and Pacific people can be explained by the younger age structure of the Māori and Pacific populations as unemployment rates for these groups are higher at all ages. After age standardisation (which takes account of the differences in the age structures of the different ethnic populations) Māori and Pacific peoples still have significantly higher unemployment rates than Europeans and these ethnic differences appear to have increased since the recession of 2008–2009 [31].

Parental unemployment can have significant effects on children's wellbeing. It reduces the family's financial resources and may lead to poverty especially if the unemployed parent is the sole breadwinner [32]. The effects of parental unemployment vary depending on the age of the child, whether one or both parents are unemployed and for how long, and whether the negative effects of reduced family income outweigh the positive effects of more time spent with the child. A recent study used data from the British Household Panel Survey (a longitudinal survey which interviews participants annually) for youths aged 11–15 years to assess self-reported happiness with life in relation to parental employment [33]. The results indicated that parental job loss had a positive effect on younger children's overall happiness but a negative or non-significant effect on older children's happiness. A similar German study of 17–25 year olds found that paternal involuntary unemployment and maternal voluntary unemployment both had significant negative effects on sons' subjective wellbeing, but daughters were unaffected by unemployment of either parent due to any reason [34]. A Swedish study used hospitalisation data for children aged 3–18 years in 1992–2007 combined with register data on parental unemployment to determine whether the children of unemployed parents had worse health [35]. It found that the children of unemployed parents were 17% more likely to be hospitalised than other children but that this effect was mostly explainable by the factors associated with unemployment: low parental age, education, and income, immigrant background, parental separation and parental hospitalisation.

The following section uses information from Statistics New Zealand's Quarterly Household Labour Force Surveys to review unemployment rates since 1986.

Data Source and Methods

Indicator

1. *Unemployment Rate: The number of unemployed people expressed as a percentage of the labour force*

Data Source

Statistics New Zealand's Household Labour Force Survey (n≈15,000 households). Quarterly since March 1986 and available on Statistics New Zealand's website www.stats.govt.nz

Notes on Interpretation

Note 1: Unemployed refers to all people in the working-age population who during the reference week were without a paid job, were available for work and:

- (a) had actively sought work in the past four weeks ending with the reference week, or
- (b) had a new job to start within four weeks [36].

Note 2: A person whose only job search method in the previous four weeks has been to look at job advertisements in the newspapers is not considered to be actively seeking work.

Note 3: Seasonal adjustment makes data for adjacent quarters more comparable by smoothing out the effects of any regular seasonal events. This ensures the underlying movements in time series are more visible. Each quarter, the seasonal adjustment process is applied to the latest and all previous quarters. This means that seasonally adjusted estimates for previously published quarters may change slightly [37].

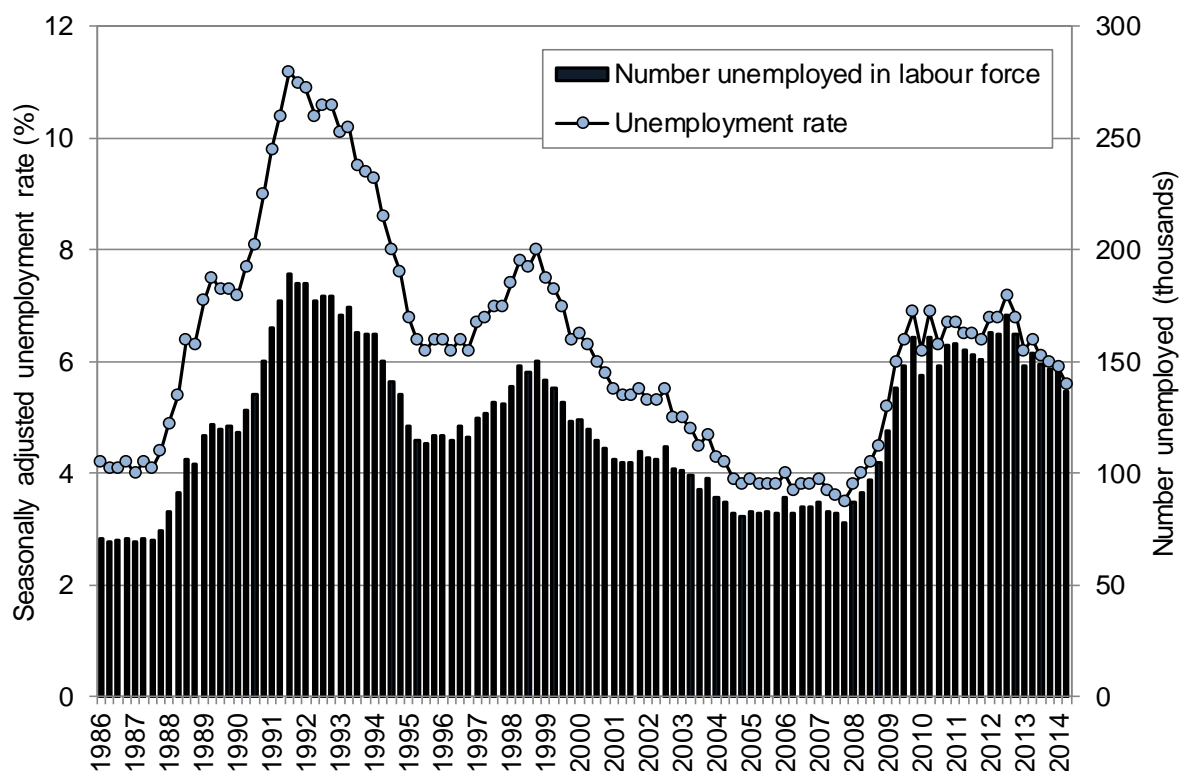


New Zealand Distribution and Trends

Seasonally Adjusted Unemployment Rates

In the quarter ending June 2014, the seasonally adjusted unemployment rate fell to 5.6%, while seasonally adjusted unemployment numbers decreased from 146,000 in the March quarter of 2014, to 137,000 in the June quarter (Figure 28). The number of people employed increased by 10,000 to reach 2,328,000 [38].

Figure 28. Seasonally adjusted quarterly unemployment rates, New Zealand March 1986 to June 2014



Source: Statistics New Zealand, Household Labour Force Survey; Note: Rates have been seasonally adjusted

Unemployment Rates by Age

In New Zealand during June 1987–2014, unemployment rates were consistently higher for younger people aged 15–19 years than other age groups. Rates were lower for each age group, with those aged 45–49 years having the lowest). In the year ending June 2014, annual unemployment rates were 22.5% for those aged 15–19 years and 11.7% for those aged 20–24 years (Figure 29).

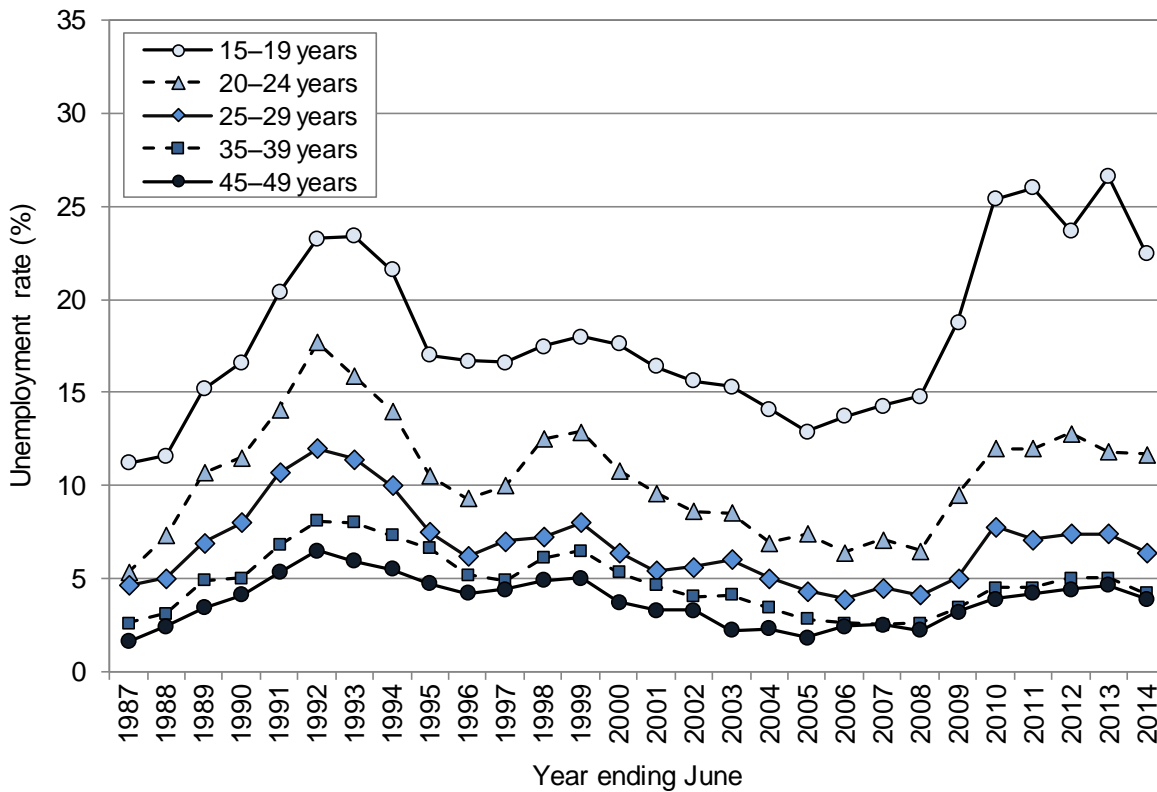
Unemployment Rates by Age and Gender

In New Zealand during June 1987–2014, there were no consistent gender differences in unemployment rates for young people aged 15–24 years. During the year ending June 2014, unemployment rates for those aged 15–19 years were 22.2% for females and 22.8% for males, while for those aged 20–24 years, rates were 12.3% for females and 11.2% for males (Figure 30).

Unemployment Rates by Ethnicity

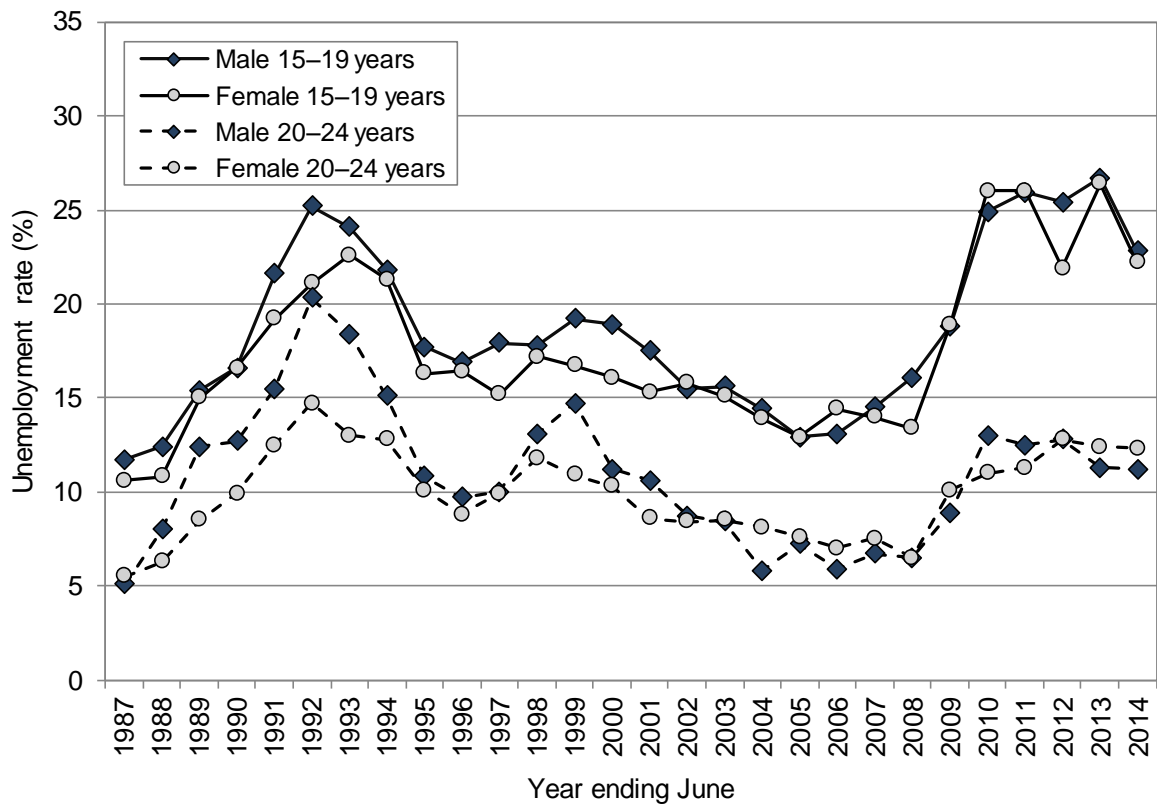
In New Zealand during the period March 2008 to June 2014 unemployment rates were consistently higher for Māori and Pacific people, followed by Asian/Indian and then European people. Unemployment rates increased for all ethnic groups during 2008 and 2009, but were more variable between 2010 and 2014. In the quarter ended June 2014, unemployment rates were 11.4% for Pacific, 11.0% for Māori, 7.3% for Asian/Indian and 4.1% for European people (Figure 31).

Figure 29. Unemployment rates by age (selected age groups), New Zealand years ending June 1987–2014



Source: Statistics New Zealand Household Labour Force Survey

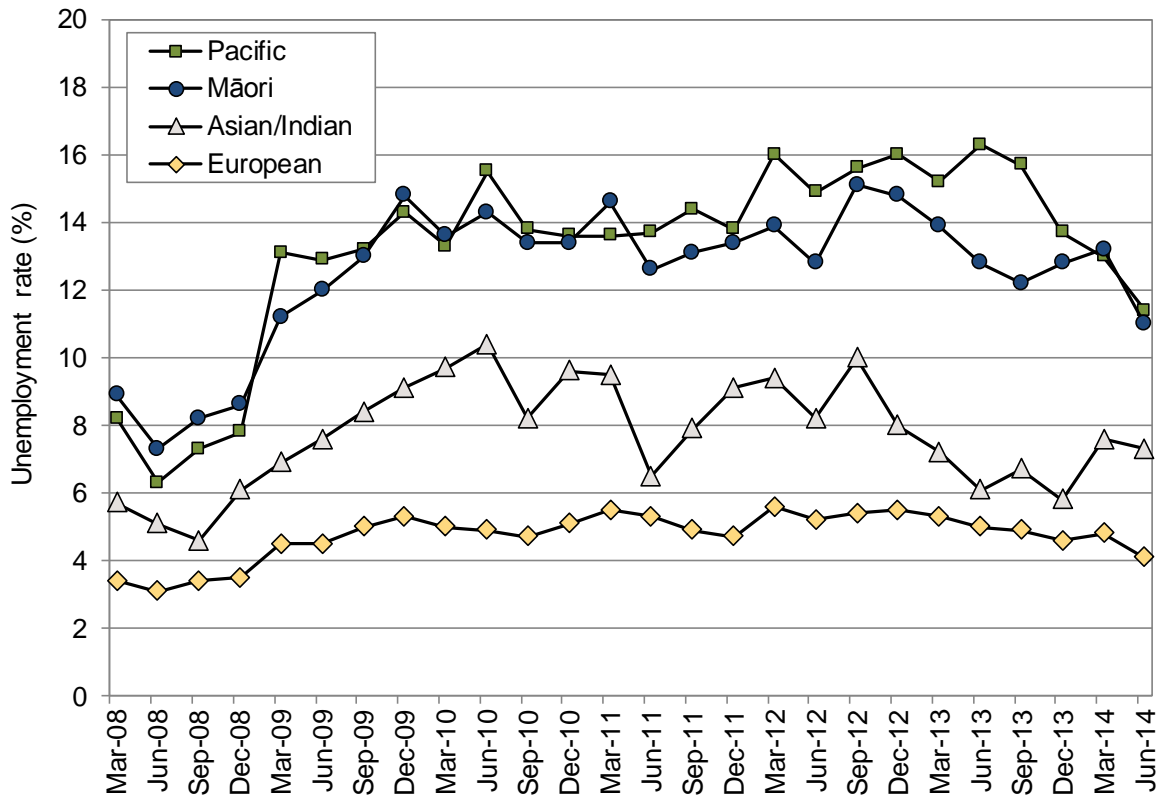
Figure 30. Unemployment rates by age and gender in young people aged 15–24 years, New Zealand years ending June 1987–2014



Source: Statistics New Zealand Household Labour Force Survey

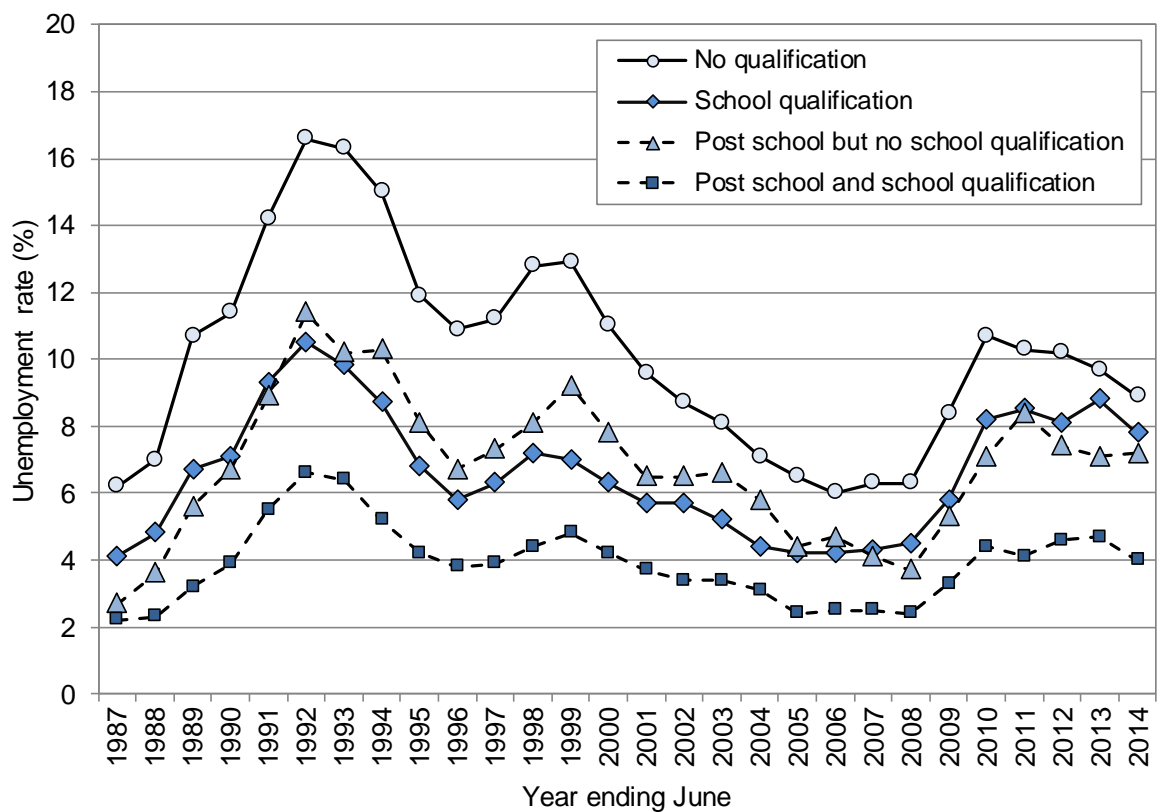


Figure 31. Quarterly unemployment rates by ethnicity, New Zealand March 2008 to June 2014



Source: Statistics New Zealand Household Labour Force Survey; Note: Ethnicity is total response

Figure 32. Unemployment rates by qualification, New Zealand years ending June 1987–2014



Source: Statistics New Zealand Household Labour Force Survey

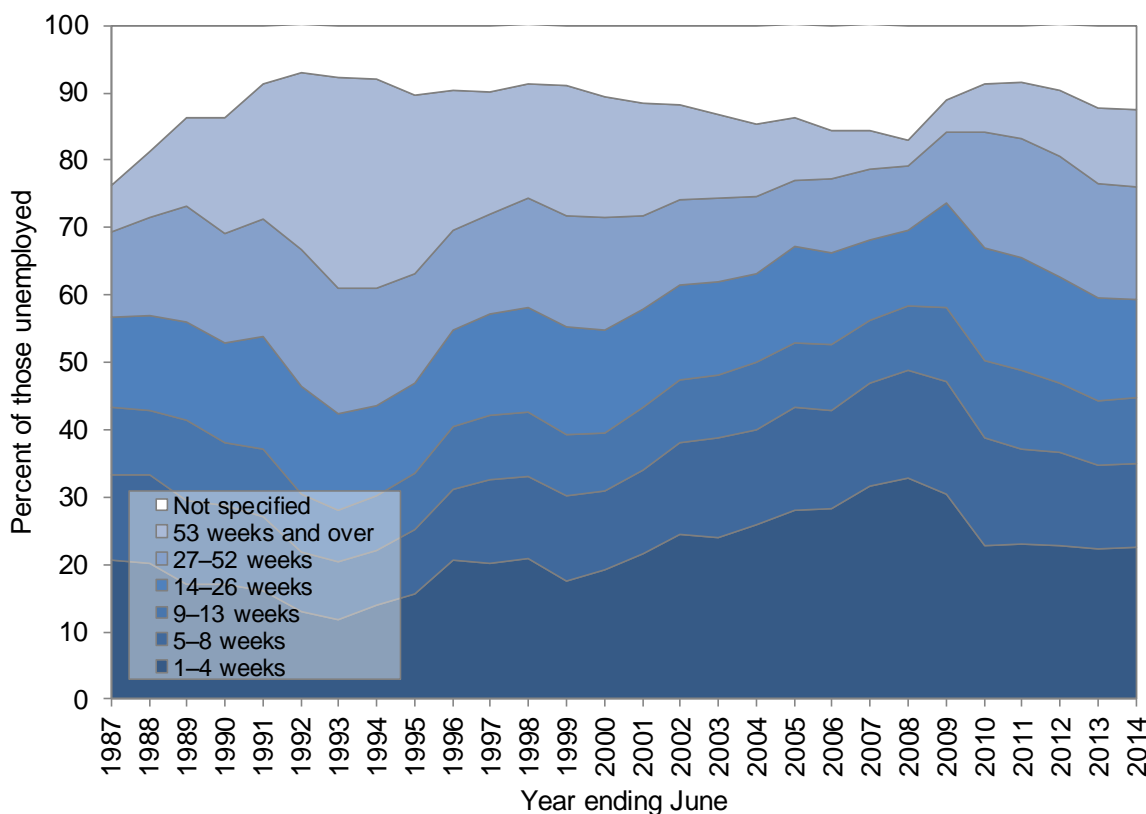
Unemployment Rates by Qualification

In New Zealand during 1987–2014 (years ending 30 June), unemployment rates were highest for those with no qualifications, followed by those with school qualifications, or post school but no school qualifications. Rates were lowest for those with both post school and school qualifications. In the year ended June 2014, unemployment rates were 8.9% for those with no qualifications, 7.8% for those with school qualifications, 7.2% for those with post school but no school qualifications and 4.0% for those with post school and school qualifications (**Figure 32**).

Duration of Unemployment

In New Zealand during 1987–2014 (years ending 30 June), duration of unemployment varied markedly, and in a manner consistent with prevailing unemployment rates. Thus the highest proportion of people unemployed for 53+ weeks occurred during the early to mid-1990s, when unemployment rates were at their peak, while the highest proportion unemployed for only 1–4 weeks occurred in the mid to late 2000s, when unemployment rates were at their lowest (**Figure 33**).

Figure 33. Percentage of those unemployed by duration of unemployment, New Zealand years ending June 1987–2014



Source: Statistics New Zealand Household Labour Force Survey

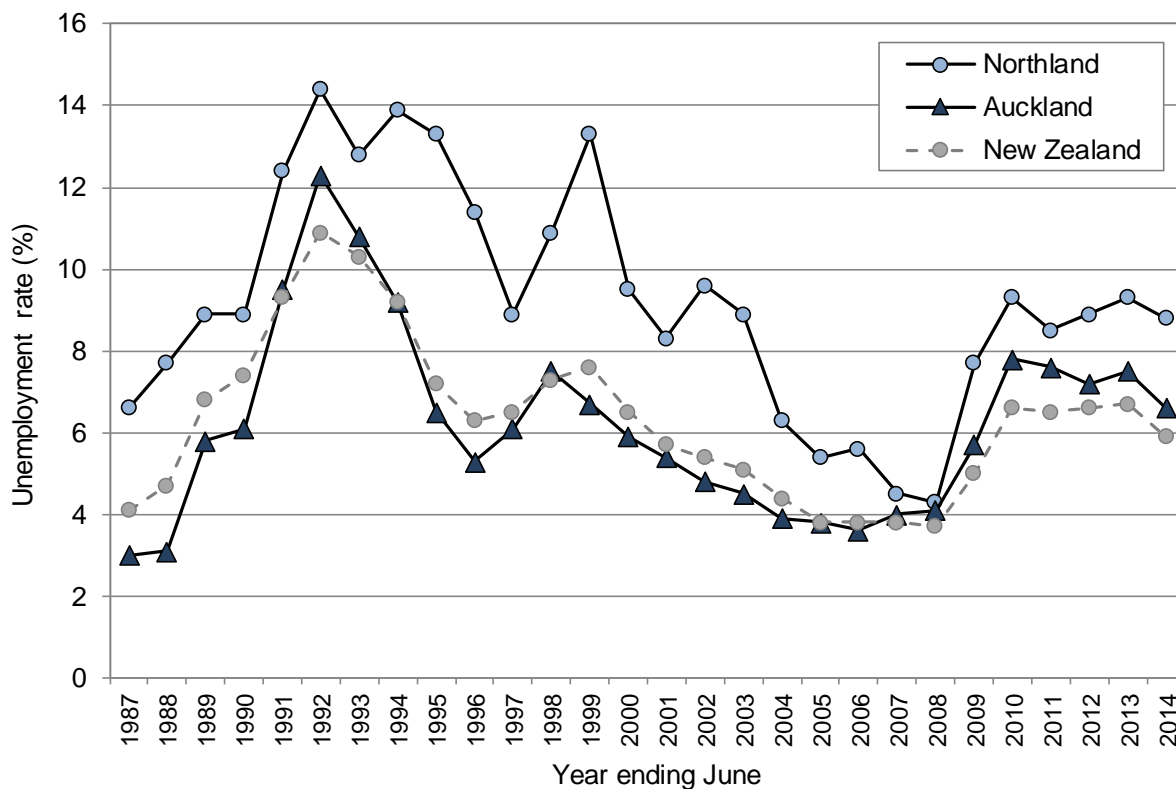
Northland and Auckland Distribution and Trends

Annual Regional Unemployment Rates

In the Northland and Auckland regions during 1987–2014 (years ending 30 June), unemployment trends were similar to those occurring nationally. However, in Northland rates were higher than the New Zealand rate throughout this period, while in Auckland rates were more similar. In both regions, the highest rates were seen in the year ending June 1992, while the lowest rates were seen in the mid-2000s (**Figure 34**).

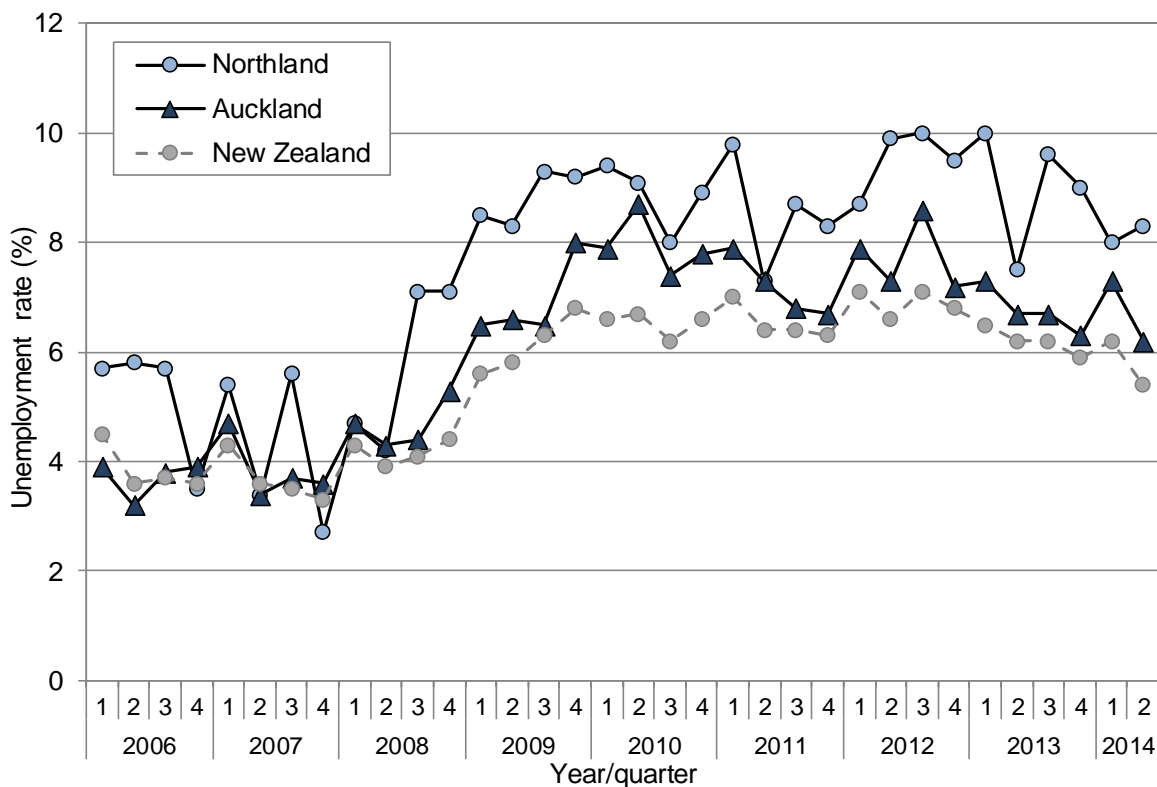


Figure 34. Unemployment rates by regional council, Northland and Auckland regions vs. New Zealand years ending June 1987–2014



Source: Statistics New Zealand Household Labour Force Survey

Figure 35. Quarterly unemployment rates by regional council, Northland and Auckland regions vs. New Zealand March 2006 to June 2014



Source: Statistics New Zealand Household Labour Force Survey



Quarterly Regional Unemployment Rates

In the Northland and Auckland regions during March 2006 to June 2014, unemployment trends were similar to those occurring nationally. Rates in Northland were higher than the New Zealand rate for the majority of this period. Rates in Auckland were also higher than the New Zealand rate from 2008 onwards, although they remained lower than in Northland for the majority of June 2008(Q3)–2014(Q2) (**Figure 35**).

Local Policy Documents and Evidence-based Reviews Relevant to Unemployment

Table 12 on page 77 considers local policy documents and evidence based reviews which are relevant to the social policy environment and the socioeconomic determinants of child and youth health.



CHILDREN RELIANT ON BENEFIT RECIPIENTS

Introduction

In New Zealand, children who are reliant on benefit recipients are a particularly vulnerable group. The Living Standards Survey conducted five years ago found that about three out of five children living in households whose main source of income was a benefit experienced material hardship [9]. Benefit-reliant families were much more likely to report living in houses that were damp or mouldy, or in very poor physical condition; that their children were having to continue to wear worn out shoes or clothing; and that they were postponing doctors' visits because of cost. All these are factors that are likely to impact adversely on children's health and wellbeing.

The following section reviews the number of children aged 0–17 years who were reliant on a benefit recipient during June, 2000–2014, using information from the Ministry of Social Development's SWIFTT database. While the number of children reliant on a benefit recipient is not exactly the same as the number living in significant hardship, nevertheless it is an indicator of the size of a vulnerable group who tend to have higher than average health needs, and so make significant demands on health services.

With the introduction of the Ministry of Social Development's Welfare Reform in July 2013, changes were made to a number of benefits, so the data on benefits in June 2014 are not directly comparable to the benefit data prior to July 2013.

Data Source and Methods

Indicator

1. Number of children aged 0–17 years reliant on a benefit recipient by benefit type

Data Source

Numerator: SWIFTT Database: Number of children aged 0–17 years who were reliant on a benefit recipient

Denominator: Statistics NZ Estimated Resident Population as at 30 June each year

Notes on Interpretation

Note 1: All data in this section were provided by the Ministry of Social Development (MSD) and were derived from the SWIFTT database. SWIFTT was developed by the NZ Income Support Service to calculate, provide and record income support payments and related client histories [39]. It provides information on the recipients of financial assistance through Work and Income.

Note 2: All figures refer to the number of children reliant on a benefit recipient at the end of June and provide no information on the number receiving assistance at other times of the year.

Note 3: The MSD's Welfare Reforms, brought into effect in July 2013, made changes to the types of benefits available, and to the obligations to be met by benefit recipients. Three new benefits (Jobseeker Support, Sole Parent Support, and Supported Living Payment) were introduced, and these replaced many of the previously existing benefits. The welfare reform changes have been described at <https://www.msd.govt.nz/about-msd-and-our-work/work-programmes/welfare-reform/july-2013/>

Note 4: The benefits prior to the June 2013 reform are not directly comparable with the benefits as at June 2014.

Prior to 2014, "Other benefits" included: Domestic Purposes Benefit - Women Alone and Caring for Sick or Infirm, Emergency Benefit, Independent Youth Benefit, Unemployment Benefit Training, and Unemployment Benefit Training Hardship, Unemployment Benefit Student Hardship, Widows Benefit, NZ Superannuation, Veterans and Transitional Retirement Benefit. "Other Benefits" *did not include* Orphan's and Unsupported Child's Benefits, and Non-benefit assistance.

From 2014, "Other benefits" included: Emergency Benefit, Youth Payment, Young Parent Payment, Unemployment Benefit Student Hardship, NZ Superannuation, Veterans and Transitional Retirement Benefit.

To be eligible for a benefit, clients must have insufficient income from all sources to support themselves and any dependents and meet specific eligibility criteria. The current eligibility criteria for benefits can be found at <http://www.workandincome.govt.nz/individuals/a-z-benefits/index.html>



New Zealand Distribution and Trends

Number of Children Reliant on a Benefit Recipient

Between 2000 and 2013, the number of children aged 0–17 years in New Zealand who were reliant on a benefit recipient dropped overall, although not consistently. There was a steady decrease from 271,463 in June 2000, to 200,525 in June 2008. The number then increased over the next three years to reach 233,633 in June 2010 after which it declined, with the greatest fall occurring between 2012 and 2013. In June 2013, 214,746 children were reliant on a benefit recipient.

Much of this variation can be attributed to changes in the number of children reliant on unemployment benefit recipients. The number of children dependent on a recipient of an unemployment benefit fell from 51,124 in June 2000 to 5,243 in June 2008. The numbers then increased to reach 17,281 in June 2010 before falling again. By June 2013, 12,622 children were reliant on an unemployment benefit recipient (**Table 8**).

Following the welfare reform of July 2013, the number of children aged 0–17 years who were reliant on a benefit recipient as at June 2014 was 196,247. Of these children, the majority were reliant on a recipient of Sole Parent Support (141,468; 72.1%). The next largest group were those reliant on a recipient of Jobseeker support (18,502; 17.0%) (**Table 8**).

Proportion of Children Reliant on a Benefit Recipient

The proportion of all children aged 0–17 years in New Zealand who were reliant on a benefit recipient fell from 26.2% in June 2000 to 18.5% in June 2008. The proportion then increased, to reach a peak of 21.4% in June 2010, before falling again to 19.6% in June 2013 (**Figure 36**).

A large part of the initial decline was due to a fall in the proportion of children reliant on unemployment benefit recipients. This fell from 4.9% of children in June 2000, to 0.5% in June 2008. It then increased to 1.6% in June 2010 before falling again to 1.2% in June 2013. The proportion of children reliant on DPB recipients also fell from 17.9% in June 2000 to 14.5% in June 2008, before increasing to 16.5% in June 2011. It then fell again to 15.1% in June 2013 (**Figure 36**).

During this period, the rate of decline in the number of children reliant on DPB recipients was much less than the rate of decline in the number reliant on unemployment benefit recipients (**Figure 36**). As a consequence, the proportion of benefit-dependent children who were reliant on DPB recipients actually increased, from 68.4% of benefit-dependent children in June 2000, to 76.9% in June 2013 (**Table 8**).

In June 2014, after the welfare reform was introduced, the proportion of all children aged 0–17 years in New Zealand who were reliant on a benefit recipient was 17.9%. The proportion of all children who were reliant on recipients of the various benefits types was: Sole Parent Support 12.9%, Jobseeker Support 3.0%, and Supported Living Payment 1.7% (**Figure 36**).

Distribution by Age

At the end of June 2014, the proportion of children reliant on a benefit recipient was highest among those aged 1–4 years. The proportion reduced gradually with increasing age through middle to late childhood, and then more steeply as children reached 13 years of age (**Figure 37**).

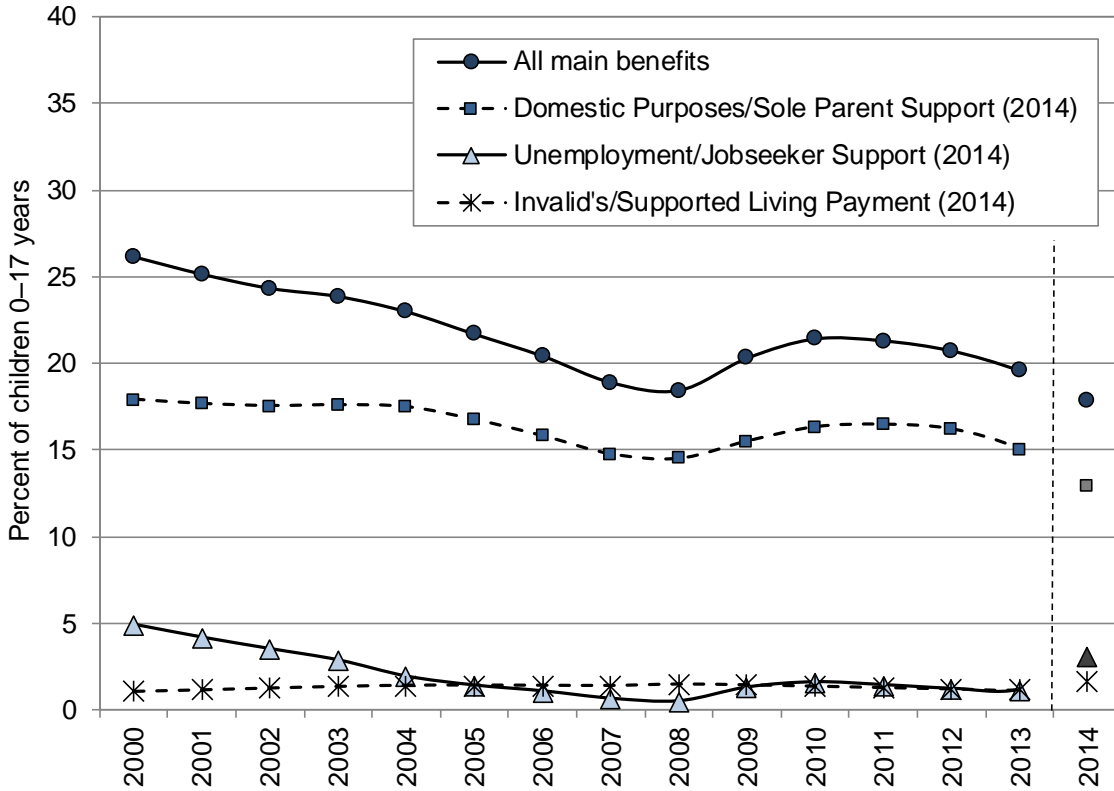


Table 8. Number of children aged 0–17 years who were reliant on a benefit recipient by benefit type, New Zealand, as at end of June 2000–2014

Year	Domestic Purposes		Unemployment		Invalid's		Sickness		Other benefits		Total
	Number	Percent*	Number	Percent*	Number	Percent*	Number	Percent*	Number	Percent*	Number
2000	185,658	68.4	51,124	18.8	11,205	4.1	11,425	4.2	12,051	4.4	271,463
2001	184,448	70.2	43,688	16.6	12,164	4.6	11,155	4.2	11,468	4.4	262,923
2002	184,497	72.0	36,960	14.4	13,290	5.2	11,836	4.6	9,611	3.8	256,194
2003	186,288	73.6	30,257	12.0	14,306	5.7	12,477	4.9	9,701	3.8	253,029
2004	186,372	76.0	20,413	8.3	15,091	6.2	13,782	5.6	9,711	4.0	245,369
2005	179,791	77.1	14,968	6.4	15,277	6.6	13,892	6.0	9,267	4.0	233,195
2006	171,011	77.3	11,422	5.2	15,291	6.9	13,775	6.2	9,598	4.3	221,097
2007	160,137	78.1	6,800	3.3	15,197	7.4	13,509	6.6	9,394	4.6	205,037
2008	157,693	78.6	5,243	2.6	16,045	8.0	11,980	6.0	9,564	4.8	200,525
2009	168,709	76.3	13,943	6.3	15,605	7.1	13,025	5.9	9,855	4.5	221,137
2010	177,874	76.1	17,281	7.4	14,840	6.4	13,798	5.9	9,840	4.2	233,633
2011	179,784	77.2	15,486	6.7	14,044	6.0	13,351	5.7	10,144	4.4	232,809
2012	177,237	78.1	13,205	5.8	13,287	5.9	12,955	5.7	10,212	4.5	226,896
2013	165,113	76.9	12,622	5.9	12,804	6.0	12,590	5.9	11,617	5.4	214,746
	Sole Parent Support (incl EMA [†])		Jobseeker Support		Supported Living Payment				Other benefits		Total
	Number	Percent*	Number	Percent*	Number	Percent*			Number	Percent*	Number
2014	141,468	72.1	33,447	17.0	18,502	9.4			2,830	1.4	196,247

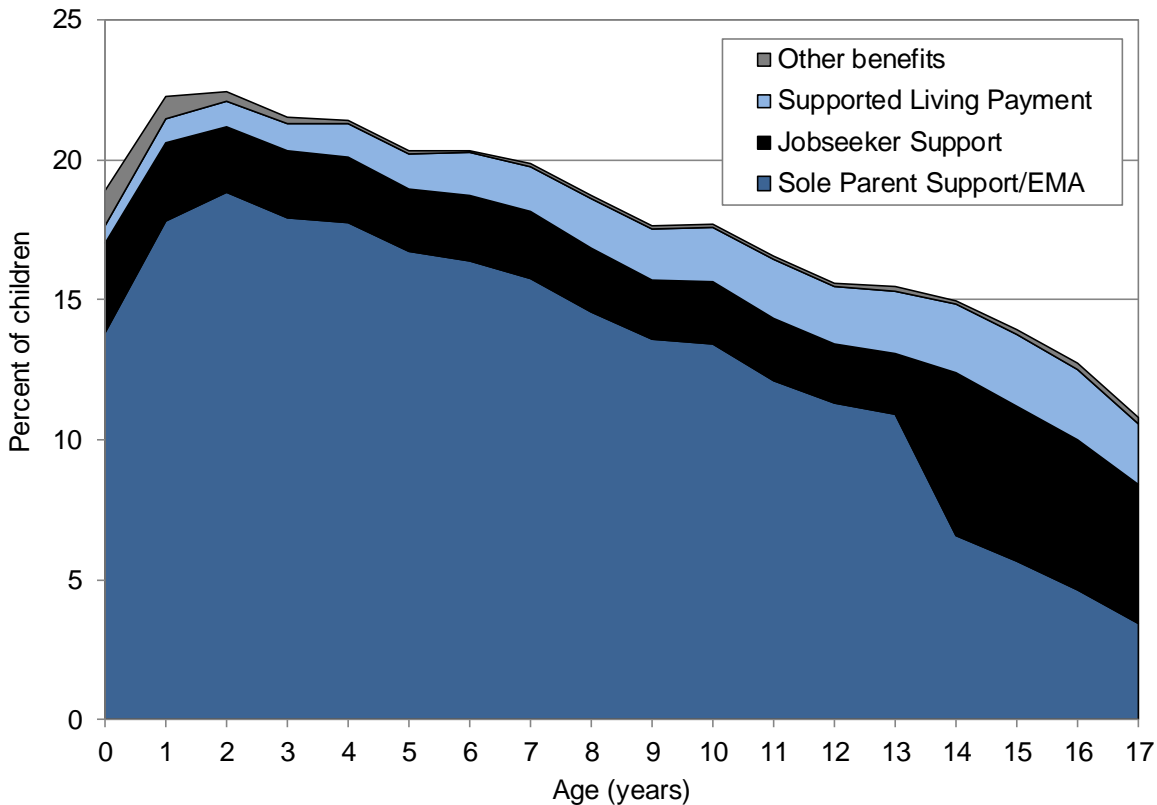
Source: MSD SWIFTT Database; Note: *Percent refers to percent of children relying on benefit recipients, rather than percent of all children; † EMA: Emergency Maintenance Allowance; for composition of “Other benefits” see Methods box above

Figure 36. Percentage of all children aged 0–17 years who were reliant on a benefit recipient by benefit type, New Zealand as at end of June 2000–2014



Source: Numerator: MSD SWIFTT Database; Denominator: Statistics NZ Estimated Resident Population; Note: The benefits prior to the June 2013 reform are not directly comparable with the benefits as at June 2014

Figure 37. Percentage of all children aged 0–17 years who were reliant on a benefit recipient by age and benefit type, New Zealand as at end of June 2014



Source: Numerator: MSD SWIFTT Database; Denominator: Statistics NZ Estimated Resident Population; Note: EMA: Emergency Maintenance Allowance; for composition of "Other benefits" see Methods box



Northern DHBs Distribution

Number of Children Reliant on a Benefit Recipient

At the end of June 2014, 12,613 Northland, 19,298 Waitemata, 14,390 Auckland and 34,674 Counties Manukau children aged 0–17 years were reliant on a benefit recipient who received their benefit from a service centre in the Northern DHBs' catchments. The majority of children reliant on benefit recipients were reliant on recipients of Sole Parent Support or the Emergency Maintenance Allowance (**Table 9**).

Table 9. Number of children aged 0–17 years who were reliant on benefit recipients by benefit type, for service centres in the Northern DHBs' catchments as at end of June 2014

DHB	Sole Parent Support/ Emergency Maintenance Allowance		Jobseeker Support		Supported Living Payment		Other main benefits		Total
	No.	%*	No.	%*	No.	%*	No.	%*	
Northland	9,191	72.9	2,322	18.4	1,057	8.4	43	0.3	12,613
Waitemata	14,013	72.6	3,477	18.0	1,729	9.0	79	0.4	19,298
Auckland	9,593	66.7	3,455	24.0	1,202	8.4	140	1.0	14,390
Counties Manukau	25,244	72.8	6,217	17.9	3,069	8.9	144	0.4	34,674

Source: MSD SWIFTT Database; Note: *Percent refers to percent of children relying on benefit recipients, rather than percent of all children; see Methods Section for composition of "Other main benefits"; Non-benefit assistance not included; Service centres include: *Northland*: Dargaville, Kaikohe, Kaitaia, Kamo, Kawakawa, Kerikeri, Onerahi, Whangarei Central; *Waitemata*: Albany, Birkenhead District, Browns Bay, Glenfield, Glenmall, Helensville, New Lynn, Orewa, Takapuna, Waitakere, Warkworth, Westgate; *Auckland DHB*: Avondale, Grey Lynn, Mt Albert, Mt Eden, Onehunga, Otahuhu, Queen Street, Tamaki, Three Kings, Waiheke Panmure, Ponsonby/Grey Lynn, Pt Chevalier, Queen Street (incl Super), Tamaki, Three Kings, Waiheke, AK Childcare Processing Centre; *Counties Manukau*: Clendon, Highland Park, Hunters Corner District, Mangere, Manukau District, Manurewa, Otara, Papakura, Papatoetoe, Pukekohe, Waiuku

Local Policy Documents and Evidence Based Reviews Relevant to Benefit Reliant Families

Table 12 on page 77 considers local policy documents and evidence based reviews which are relevant to the social policy environment and the socioeconomic determinants of child and youth health.



YOUNG PEOPLE RELIANT ON BENEFITS

Introduction

The following section uses data from the Ministry of Social Development's SWIFTT database to explore the number of young people aged 16–24 years who were reliant on a benefit during 2000–2014.

Data Source and Methods

Definition

1. Number of young people aged 16–24 years who were reliant on a benefit

Data Source

Numerator: SWIFTT Database: Number of young people aged 16–24 years who were reliant on a benefit

Denominator: Statistics NZ Estimated Resident Population as at 30 June

Notes on Interpretation

Note 1: All data in this section were provided by the Ministry of Social Development (MSD) and were derived from the SWIFTT database. SWIFTT was developed by the NZ Income Support Service to calculate, provide and record income support payments and related client history [39]. It provides information on the recipients of financial assistance through Work and Income.

Note 2: All figures refer to the number of children reliant on a benefit recipient at the end of June and provide no information on those receiving assistance at other times of the year.

Note 3: Changes were made to the welfare system in July 2013 in which the types of benefits available and the obligations to be met by benefit recipients were modified. Three new benefits (Jobseeker Support, Sole Parent Support, and Supported Living Payment) were introduced, and these replaced many of the previously existing benefits. The welfare reform changes are described at <https://www.msd.govt.nz/about-msd-and-our-work/work-programmes/welfare-reform/july-2013/>

Note 4: The benefits prior to the June 2013 reform are not directly comparable with the benefits as at June 2014.

Prior to 2014, "Other benefits" includes: Domestic Purposes Benefit - Women Alone and Caring for Sick or Infirm, Emergency Benefit, Independent Youth Benefit, Unemployment Benefit Training, and Unemployment Benefit Training Hardship, Unemployment Benefit Student Hardship, Widows Benefit, NZ Superannuation, Veterans and Transitional Retirement Benefit. "Other benefits" *does not include* Orphan's and Unsupported Child's Benefits, and Non-benefit assistance. From 2014, "Other benefits" include: Emergency Benefit, Youth Payment, Young Parent Payment, Unemployment Benefit Student Hardship, NZ Superannuation, Veterans and Transitional Retirement Benefit.

To be eligible for a benefit, clients must have insufficient income from all sources to support themselves and any dependents and meet specific eligibility criteria. The current eligibility criteria for benefits can be found at <http://www.workandincome.govt.nz/individuals/a-z-benefits/>

New Zealand Distribution and Trends

Number of Young People Reliant on Benefits

In New Zealand during June 2000–2013, there were large fluctuations in the number of young people aged 16–24 years reliant on a benefit (**Table 8**), with rates falling from 165.1 per 1,000 in June 2000, to 75.5 per 1,000 in June 2007, before increasing again to 117.5 per 1,000 in June 2010. By June 2013, the rate was 97.6 per 1,000 (**Table 8**). When broken down by benefit type, the largest initial declines were seen for those reliant on an unemployment benefit, with rates falling from 89.9 per 1,000 in June 2000, to 8.6 per 1,000 in 2008, before increasing to 34.3 per 1,000 in 2010. By June 2013 the rate was 24.6 per 1,000. In contrast, the proportion reliant on a domestic purposes benefit declined much more slowly, from 42.1 per 1,000 in June 2000, to 32.9 per 1,000 in 2007, before increasing again to 40.0 in 2011. The proportion reliant on invalid's and sickness benefits, however, increased for the majority of 2000–2013. Thus by June 2013, 13.3 per 1,000 young people were reliant on an invalid's benefit, and 14.7 per 1,000 on a sickness benefit (**Table 8, Figure 38**).

In June 2014, following the welfare reform in July 2013, the number of young people reliant on a benefit was 52,663. The majority were reliant on the Jobseeker support, followed by Sole Parent Support (**Table 8**).

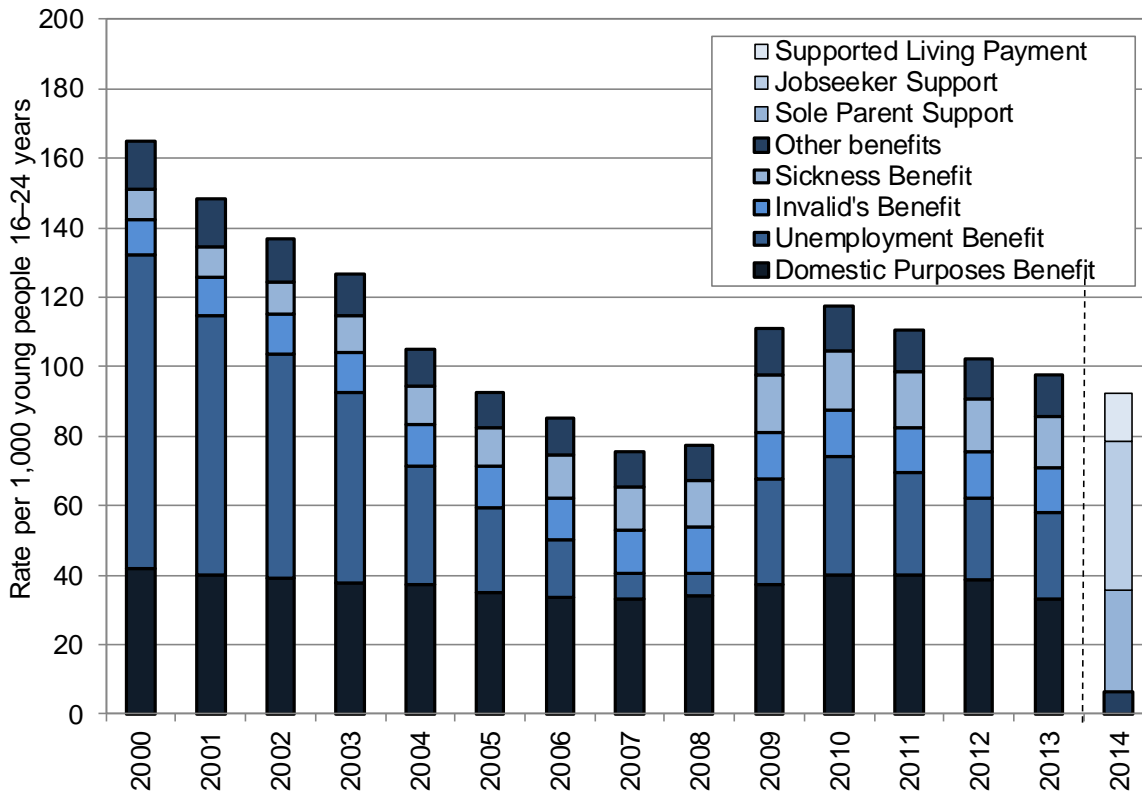


Table 10. Number and proportion of young people aged 16–24 years receiving a benefit by benefit type, New Zealand June 2000–2014

Year	Unemployment			Domestic Purposes			Invalid's			Sickness			Other benefits			Total	
	No.	%*	Rate	No.	%*	Rate	No.	%*	Rate	No.	%*	Rate	No.	%*	Rate	No.	Rate
2000	41,774	54.4	89.92	19,551	25.5	42.08	4,899	6.4	10.54	3,920	5.1	8.44	6,581	8.6	14.17	76,725	165.15
2001	35,667	50.3	74.77	19,081	26.9	40.00	5,220	7.4	10.94	4,178	5.9	8.76	6,708	9.5	14.06	70,854	148.54
2002	31,785	47.5	64.94	19,039	28.4	38.90	5,493	8.2	11.22	4,594	6.9	9.39	6,031	9.0	12.32	66,942	136.77
2003	27,319	42.9	54.44	19,031	29.9	37.92	5,792	9.1	11.54	5,453	8.6	10.87	6,099	9.6	12.15	63,694	126.92
2004	17,708	32.7	34.43	19,069	35.2	37.08	6,130	11.3	11.92	5,617	10.4	10.92	5,586	10.3	10.86	54,110	105.21
2005	12,837	26.4	24.37	18,512	38.0	35.15	6,324	13.0	12.01	5,820	12.0	11.05	5,162	10.6	9.80	48,655	92.37
2006	8,948	19.5	16.60	18,092	39.4	33.56	6,510	14.2	12.07	6,672	14.5	12.38	5,692	12.4	10.56	45,914	85.16
2007	4,172	10.2	7.68	17,852	43.5	32.88	6,674	16.3	12.29	6,903	16.8	12.71	5,418	13.2	9.98	41,019	75.55
2008	3,644	8.6	6.66	18,545	43.9	33.92	7,144	16.9	13.07	7,404	17.5	13.54	5,480	13.0	10.02	42,217	77.21
2009	16,722	27.4	30.37	20,562	33.7	37.35	7,359	12.1	13.37	9,140	15.0	16.60	7,262	11.9	13.19	61,045	110.87
2010	19,039	29.2	34.34	22,154	34.0	39.96	7,444	11.4	13.43	9,415	14.5	16.98	7,089	10.9	12.79	65,141	117.50
2011	16,374	26.6	29.33	22,320	36.2	39.98	7,432	12.1	13.31	8,794	14.3	15.75	6,727	10.9	12.05	61,647	110.43
2012	13,125	22.8	23.35	21,775	37.9	38.74	7,429	12.9	13.22	8,698	15.1	15.48	6,454	11.2	11.48	57,481	102.27
2013	13,939	25.2	24.63	18,773	34.0	33.18	7,507	13.6	13.27	8,294	15.0	14.66	6,740	12.2	11.91	55,253	97.64
	Jobseeker Support			Sole Parent Support (incl EMA)			Supported Living Payment						Other benefits			Total	
	No.	%*	Rate	No.	%*	Rate	No.	%*	Rate	No.	%*	Rate	No.	%*	Rate	No.	Rate
2014	24,343	46.2	42.73	16,742	31.8	29.39	7,888	15.0	13.85				3,690	7.0	6.48	52,663	92.44

Source: Numerator: MSD SWIFTT Database; Denominator: Statistics NZ Estimated Resident Population; Note: %* refers to percent of young people receiving a benefit, rather than percent of all young people; Rate = rate per 1,000 young people aged 16–24 years; EMA = Emergency Maintenance Allowance; For composition of “Other benefits” see Methods box; Non-benefit assistance not included

Figure 38. Young people aged 16–24 years receiving a benefit by benefit type, New Zealand June 2000–2014



Source: Numerator: MSD SWIFTT database; Denominator: Statistics NZ Estimated Resident Population; Note: The benefits prior to the June 2013 reform are not directly comparable with the benefits as at June 2014; for composition of “Other benefits” see Methods box; Non-benefit Assistance not included

New Zealand Distribution by Ethnicity

Jobseeker Support

In New Zealand as at June 2014, 42.7 per 1,000 young people were reliant on a Jobseeker support benefit. The Jobseeker Support reliance rate was highest for Māori (84.5 per 1,000 Māori young people), followed by Pacific (39.0 per 1,000 Pacific young people), and 37.1 per 1,000 for European/Other young people (Figure 39).

Sole Parent Support

In New Zealand as at June 2014, 29.4 per 1,000 young people were reliant on Sole Parent Support. The reliance rate was also highest for Māori young people (76.7 per 1,000 Māori young people), followed by Pacific (35.7 per 1,000 for Pacific young people) and 18.1 per 1,000 for European/Other young people (Figure 39).

Supported Living Payment

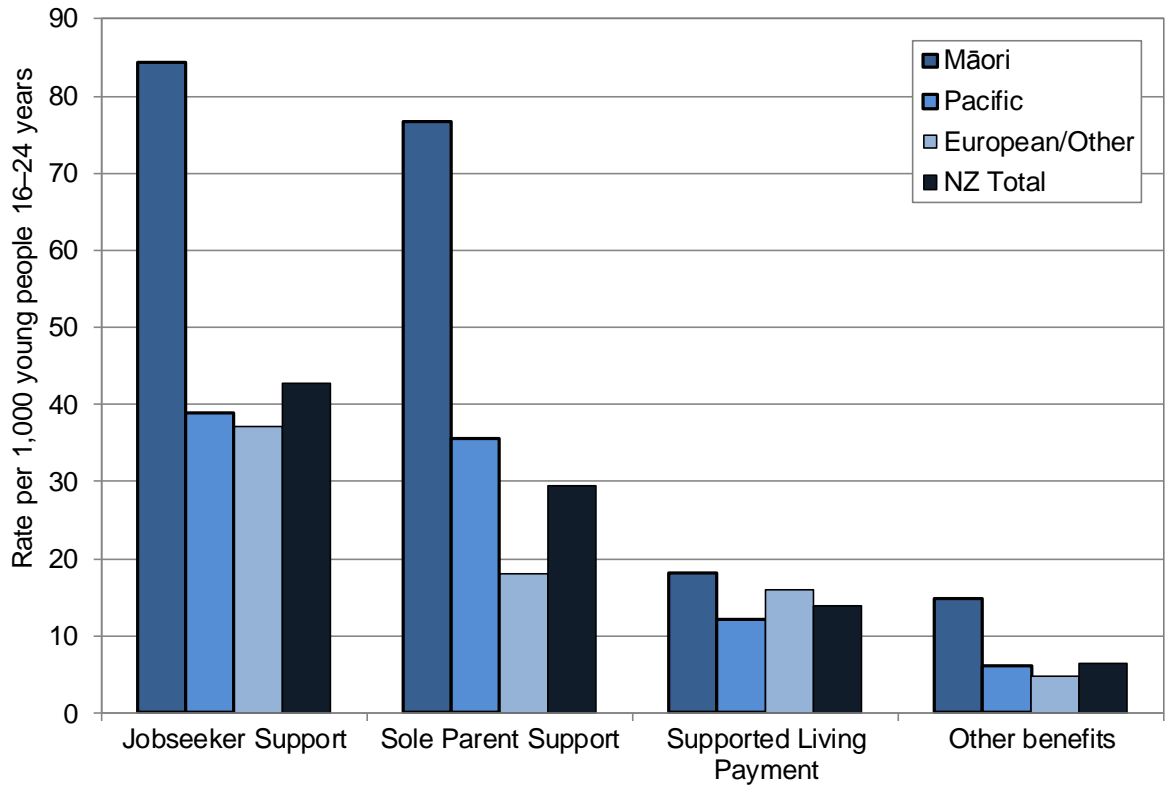
In New Zealand as at June 2014, 13.8 per 1,000 young people were reliant on a Supported Living Payment. The reliance rate was also higher for Māori young people than for Pacific and European/Other young people (Figure 39).

Distribution of Supported Living Payment by Cause of Incapacity

In New Zealand during June 2014, 36.1% of young people receiving a Supported Living Payment benefit required financial support for psychological or psychiatric reasons, while 14.8% required support for intellectual disabilities. An additional 18.9% required support as the result of congenital conditions, and 7.7% as the result of nervous system problems (Figure 40).

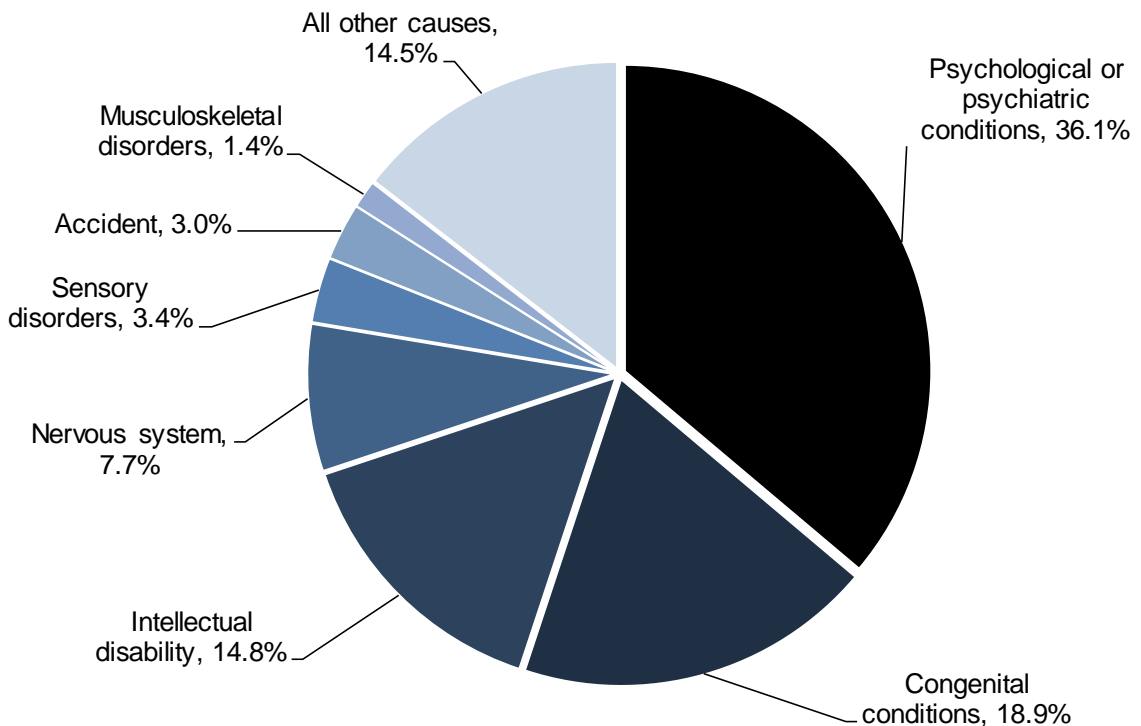


Figure 39. Young people aged 16–24 years receiving a benefit by ethnicity and benefit type, New Zealand as at June 2014



Source: Numerator: MSD SWIFTT database; Denominator: Statistics NZ Estimated Resident Population; Note: For composition of “Other benefits” see Methods box

Figure 40. Proportion of young people aged 16–24 years receiving a Supported Living Payment by cause of incapacity, New Zealand June 2014 (n=7,888)



Source: MSD SWIFTT database; Note: Only individuals with medical certificates have a documented cause of incapacity



Northern DHBs Distribution

Number of Young People Reliant on Benefits

As information on benefit recipients was not able to be mapped by domicile code, it was not possible to provide information on the number of young people resident in the Northern DHBs who were reliant on benefits as at June 2014. Information was available, however, on the number of young people receiving benefits from service centres in or adjacent to, the DHBs' boundaries (although the lack of a clearly defined denominator precluded the calculation of rates).

At the end of June 2014, 2,839 Northland, 4,805 Waitemata, 3,257 Auckland and 6,689 Counties Manukau young people aged 16–24 years were reliant on a benefit and received their benefit from a service centre in the DHB's catchment. While Jobseeker Support was the most common benefit received in most DHBs (except Counties Manukau), a significant number of young people were receiving Sole Parent Support (including the Emergency Maintenance Allowance), with a smaller number receiving the Supported Living Payment (Table 11).

Table 11. Number of young people aged 16–24 years receiving a benefit by benefit type, for service centres in the Northern DHBs' catchments, June 2014

DHB	Jobseeker Support		Sole Parent Support/ Emergency Maintenance Allowance		Supported Living Payment		Other main benefits		Total
	No.	%*	No.	%*	No.	%*	No.	%*	
Northland	1,515	53.4	1,017	35.8	297	10.5	10	0.4	2,839
Waitemata	2,438	50.7	1,535	31.9	812	16.9	20	0.4	4,805
Auckland	1,664	51.1	958	29.4	598	18.4	37	1.1	3,257
Counties Manukau	2,719	40.6	2,911	43.5	1,037	15.5	22	0.3	6,689

Source: MSD SWIFTT database; Note: *Percent refers to percent of young people receiving a benefit, rather than percent of all young people; For composition of "Other benefits" see Methods box; Non-benefit assistance not included; Service centres include: *Northland*: Dargaville, Kaikohe, Kaitaia, Kamo, Kawakawa, Kerikeri, Onerahi, Whangarei Central; *Waitemata*: Albany, Birkenhead District, Browns Bay, Glenfield, Glenmall, Helensville, New Lynn, Orewa, Takapuna, Waitakere, Warkworth, Westgate; *Auckland DHB*: Avondale, Grey Lynn, Mt Albert, Mt Eden, Onehunga, Otahuhu, Queen Street, Tamaki, Three Kings, Waiheke Panmure, Ponsonby/Grey Lynn, Pt Chevalier, Queen Street (incl Super), Tamaki, Three Kings, Waiheke, AK Childcare Processing Centre; *Counties Manukau*: Clendon, Highland Park, Hunters Corner District, Mangere, Manukau District, Manurewa, Otara, Papakura, Papatoetoe, Pukekohe, Waiuku.

Local Policy Documents and Evidence Based Reviews Relevant to the Economic Environment for Young People

Table 12 on page 77 considers local policy documents and evidence based reviews which are relevant to the social policy environment and the socioeconomic determinants of child and youth health.



YOUNG PEOPLE NOT IN EMPLOYMENT, EDUCATION OR TRAINING (NEET)

Introduction

Young people are particularly vulnerable to the effects of economic downturns. Data from OECD countries indicated that, during the recession of 2008–9, in most OECD countries, youth unemployment rates rose more rapidly than adult unemployment rates [40]. Unemployment statistics do not fully capture the situation of young people as many are students and therefore not part of the full time workforce. When jobs are hard to get, young people’s participation in further education tends to increase. Policymakers developed the concept of NEET “not in employment, education or training” to facilitate comparisons between countries and to increase the visibility on the policy agenda of an especially vulnerable group of young people [41]. Young people who spend time NEET are at higher risk of becoming socially, economically and politically disengaged from the rest of society and of insecure and poor quality future employment, youth offending and mental and physical health problems [41].

Statistics New Zealand defines NEET as “people aged 15–24 years who are not in employment, education, or training” and states that NEET includes both those people who are unemployed and not in education and those who are not in the labour force and, at the same time, not in education or training [42]. The distinction between “unemployed” and “not in the labour force” is that those classified as unemployed are available for work and actively looking for work whereas those classified as “not in the labour force” are not. Some those who are not part of the labour force are engaged in unpaid caregiving.

The following section uses data from Statistics New Zealand’s Quarterly Household Labour Force Survey to review youth NEET rates since March 2004.

Data Source and Methods

Definition

The NEET Rate is calculated as [42]:

$$\left(\frac{\text{Number of unemployed youth + number of youth not in the labour force} - \text{number of unemployed youth and youth not in the labour force who are in education or training}}{\text{Total number of youth}} \right) \times 100$$

Data Source

Statistics New Zealand’s Household Labour Force Survey (n≈15,000 households). Available on the Infoshare page on Statistics New Zealand’s website <http://www.stats.govt.nz/infoshare/>.

Notes on Interpretation

Note 1: Unemployed refers to all people in the working-age population who during the reference week were without a paid job, were available for work and:

- (a) had actively sought work in the past four weeks ending with the reference week, or
- (b) had a new job to start within four weeks [36]

Those without a paid job who do not fulfil the above criteria are considered to be not in the labour force.

A person whose only job search method in the previous four weeks has been to look at job advertisements in the newspapers is not considered to be actively seeking work.

Note 2: Seasonal adjustment makes data for adjacent quarters more comparable by smoothing out the effects of any regular seasonal events. This ensures the underlying movements in time series are more visible. Each quarter, the seasonal adjustment process is applied to the latest and all previous quarters. This means that seasonally adjusted estimates for previously published quarters may change slightly [37].

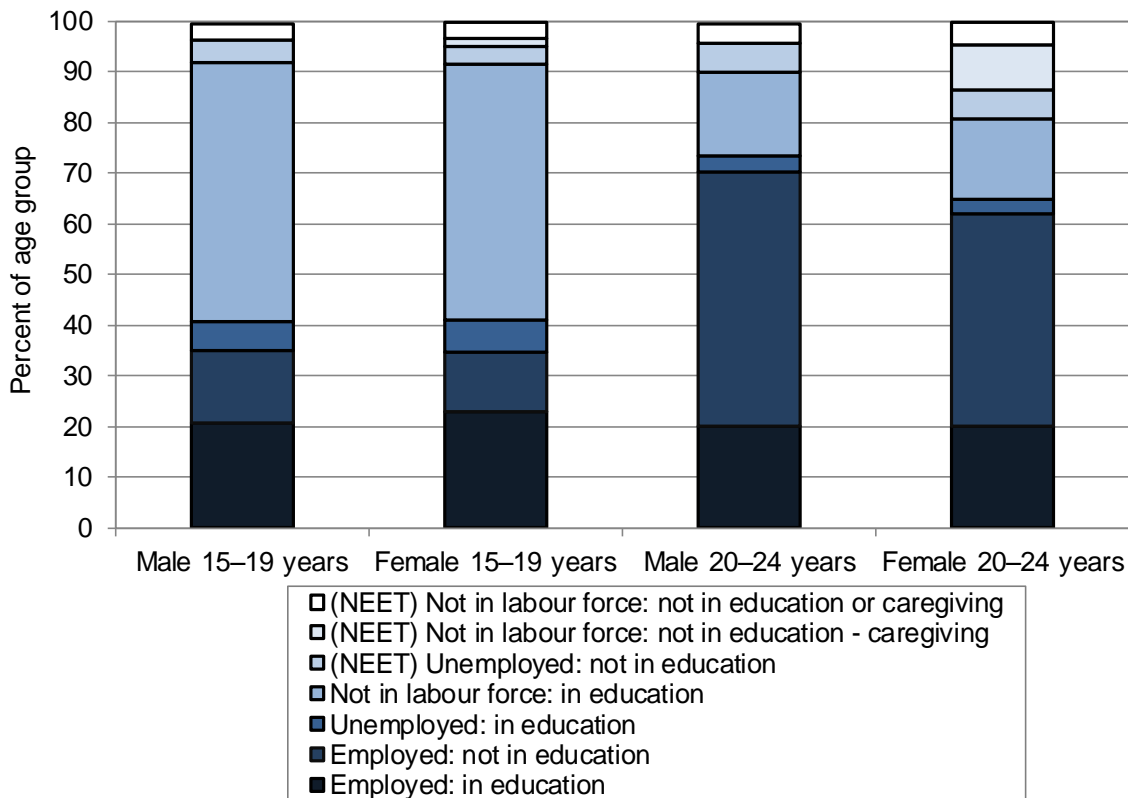


New Zealand Distribution and Trends

Labour Force Status by Age and Gender

In New Zealand during 2014, the majority of young people were in work, education or training, with the largest category for 15–19 year olds being *not in the labour force: in education* (51% of both males and females). In contrast, the largest category for 20–24 year olds was *employed: not in education* (50.5% of males and 41.8% of females). For those in the NEET category, gender differences in the proportions in the *unemployed: not in education* and *not in the labour force: not in education or caregiving* categories were not marked. However, a much higher proportion of females than males were in the *not in the labour force: not in education-caregiving* category, with gender differences being most marked in the 20–24 year age group (**Figure 41**).

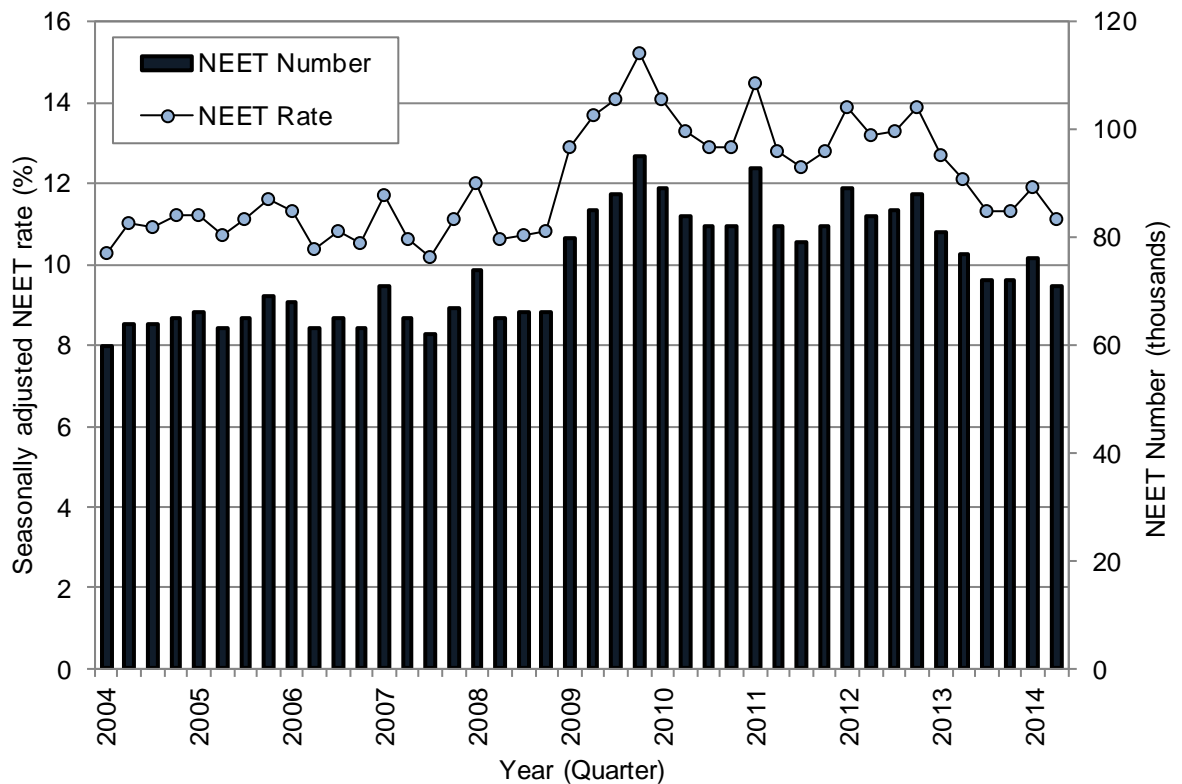
Figure 41. Labour force status of young people by age and gender, New Zealand 2014



Source: Statistics New Zealand Household Labour Force Survey

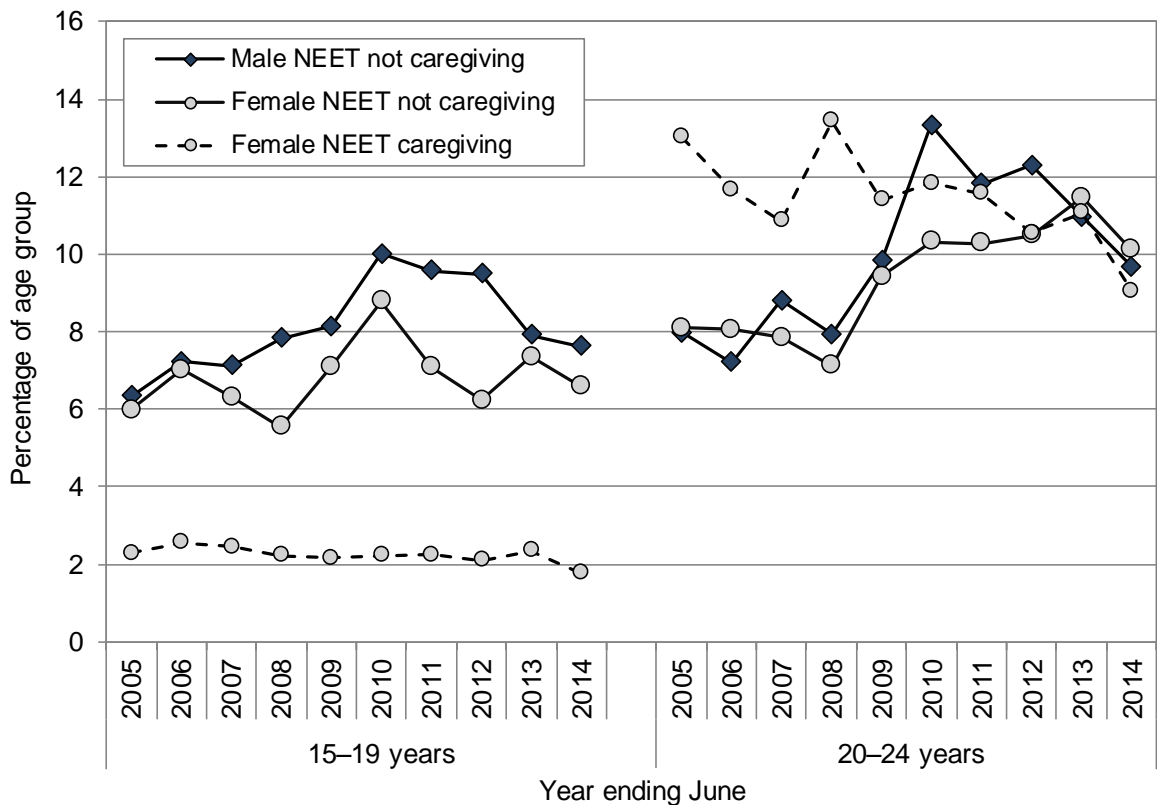


Figure 42. Seasonally adjusted quarterly NEET rates in young people aged 15–24 years, New Zealand March 2004 to June 2014



Source: Statistics New Zealand Household Labour Force Survey; Note: Rates are seasonally adjusted

Figure 43. Young people not engaged in employment, education or training by age and caregiving status, New Zealand years ending June 2005–2014



Source: Statistics New Zealand Household Labour Force Survey; Note: Male NEET caregiving not included due to very small numbers



Seasonally adjusted NEET rates

In New Zealand, seasonally adjusted NEET rates were relatively static during 2004–2008 but began to rise thereafter, reaching their highest point, at 15.2% (n=95,000), in the fourth quarter of 2009. Since then, rates have exhibited a general downward trend, with rates in the June 2014 quarter being 11.1% (n=71,000) (**Figure 42**).

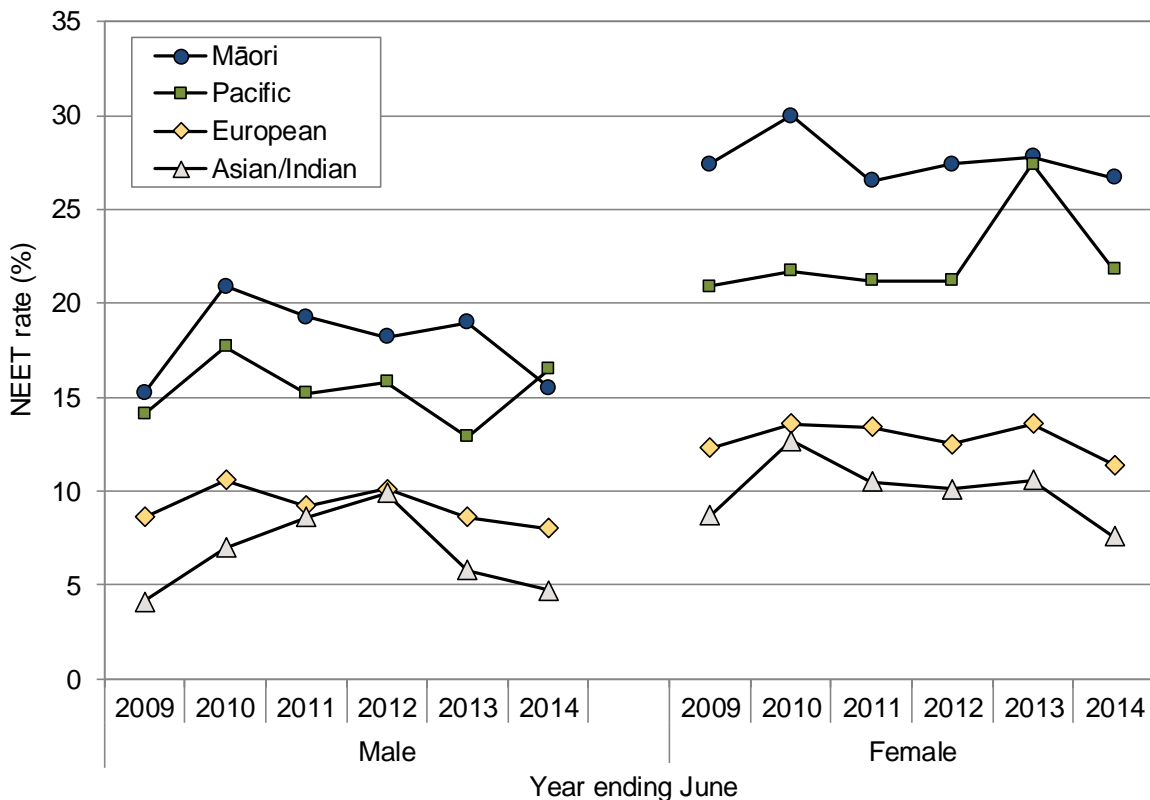
NEET rates by age and caregiving status

In New Zealand NEET rates in young people who were not engaged in caregiving roles increased between 2008 and 2010, and then (with the exception of females aged 20–24 years) gradually declined thereafter. In contrast, NEET rates in females aged 15–19 years engaged in caregiving roles were static during 2009–2014, while rates for females aged 20–24 years fluctuated during 2005–2011 and then declined (**Figure 43**).

NEET rates by ethnicity

In New Zealand during 2009–2014, NEET rates were higher for Māori, then Pacific, then European and then Asian/Indian young people. NEET rates were also higher for females than for males in each ethnic group (**Figure 44**). In the year ending June 2014, NEET rates (both genders combined) were 21% for Māori, 19.2% for Pacific, 6.1% for Asian/Indian and 9.6% for European young people.

Figure 44. NEET rates in young people by gender and ethnicity, New Zealand years ending June 2009–2014



Source: Statistics New Zealand Household Labour Force Survey; Note: Ethnicity is total response

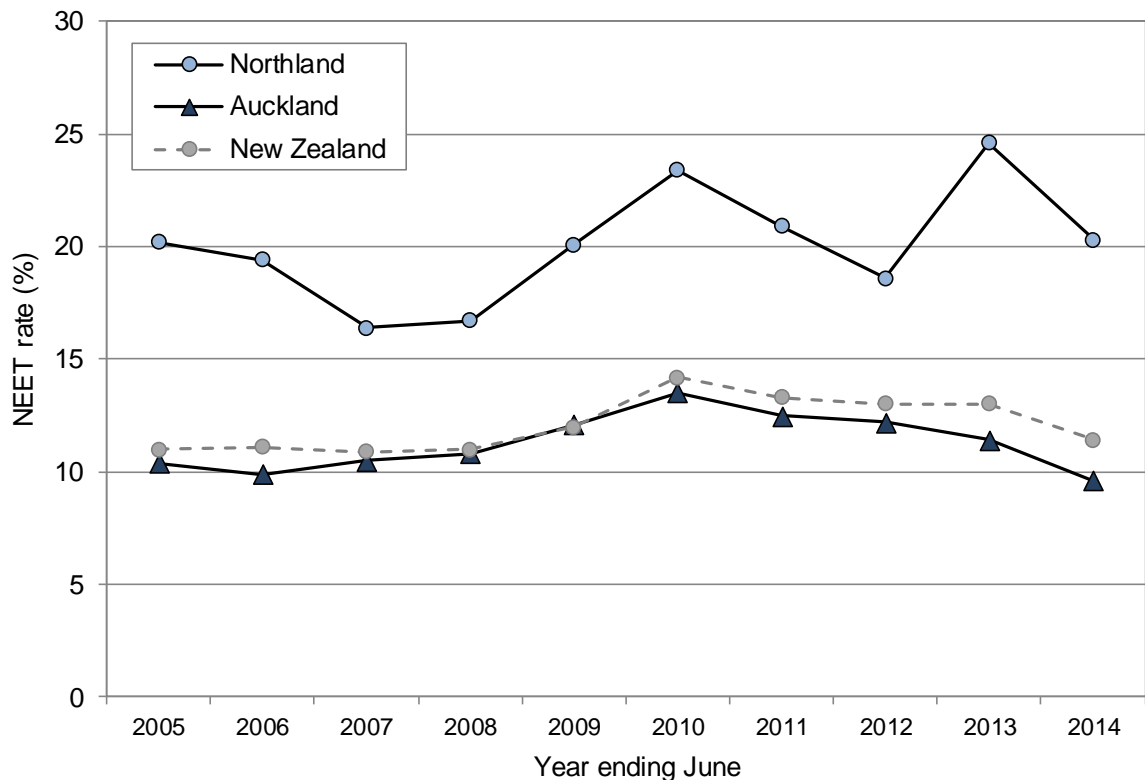


Northland and Auckland Distribution and Trends

Distribution by Regional Council

In the Northland region during June 2007–2013, NEET rates were consistently higher than the New Zealand rate, while in the Auckland region, rates were more similar to the New Zealand rate. While large year to year variations were evident in Northland, in Auckland NEET rates increased during the mid-late 2000s, reached a peak in 2010 and then gradually declined (**Figure 45**).

Figure 45. NEET rates in young people aged 15–24 years by regional council, Northland and Auckland regions vs. New Zealand years ending June 2005–2014



Source: Statistics New Zealand Household Labour Force Survey

Local Policy Documents and Evidence-based Reviews Relevant to the Social Determinants of Health

Table 12 (below) provides a brief overview of local policy documents and evidence-based reviews which consider policies to address the social determinants of health.



Table 12. Local policy documents and evidence-based reviews which consider policies to address the social determinants of child and youth health

Ministry of Health publications
<p>Ministry of Health. 2002. Reducing Inequalities in Health. Wellington: Ministry of Health. http://www.health.govt.nz/publication/reducing-inequalities-health</p> <p>This report considers socioeconomic gradients and ethnic disparities in health in New Zealand. The report finds that addressing these inequalities in health requires a population health approach that takes into account all the influences on health and how they can be tackled. This approach requires both intersectoral action that addresses the social and economic determinants of health and action within health and disability services. The report proposes principles that should be applied to ensure that health sector activities help to overcome health inequalities. The proposed framework for intervention entails developing and implementing comprehensive strategies at four levels: structural (targeting the social, economic, cultural and historical determinants of health inequalities; intermediary pathways (targeting the material, psychosocial and behavioural factors that mediate health effects; health and disability services (undertaking specific actions within health and disability services); and impact (minimising the impact of disability and illness on socioeconomic position). The framework can be used to review current practice and ensure that actions contribute to improving the health of individuals and populations and to reducing inequalities in health.</p>
Other government publications
<p>New Zealand Treasury. 2011. Working Towards Higher Living Standards for New Zealanders. New Zealand Treasury Paper 11/02. Wellington: New Zealand Treasury. http://www.treasury.govt.nz/publications/research-policy/tp/higherlivingstandards</p> <p>This paper discusses the Treasury's understanding of living standards, which are defined as incorporating a broad range of material and non-material factors such as trust, education, health and environmental quality. The Treasury has developed a "Living Standards Framework" centred on four main capital stocks: financial/physical, human, social, and natural; from which flows of material and non-material goods and services which enhance living standards are derived. The importance of the way living standards are distributed across society, and consideration of the distributional impacts of policy choices are highlighted as core aspects of policy advice.</p>
Systematic reviews
<p>Ndumbe-Eyoh S, Moffatt H. 2013. Intersectoral action for health equity: a rapid systematic review. BMC Public Health, 13, 1056. http://www.biomedcentral.com/content/pdf/1471-2458-13-1056.pdf</p> <p>Most of the social determinants of health are outside the realm of the health sector therefore those working in the health sector need to collaborate with governmental and non-governmental agencies to develop policies and programs to reduce health inequalities. Intersectoral relationships can involve information sharing, cooperation, coordination and integration. This review aimed to assess the impact and effectiveness of intersectoral action in public health on the social determinants of health and health equity. The review authors identified 17 articles of varying methodological quality meeting their inclusion criteria: one systematic review, 14 quantitative studies, and two qualitative studies. The findings of the systematic review (Smith et al. 2009) are discussed below. Only two of the primary studies examined interventions directed at upstream (system-level) determinants of health, one housing and the other, employment. Eight studies reported on interventions addressing a variety of midstream (community-level) determinants: employment and working conditions (2 studies), early childhood literacy development, housing (NZ's Healthy Housing Programme), social and physical environments (3 studies), and social and physical environments and food security. The studies of upstream and midstream interventions found mixed effects. Seven studies evaluated downstream interventions, all focused on access to health care. The studies of downstream interventions found that interventions generally had positive effects, increasing the availability and use of services by disadvantaged communities. None of studies set out to examine the effectiveness of intersectoral action on health equity specifically, and most of the outcome evaluations were not methodologically strong, therefore the review authors found it difficult to tell whether the effectiveness or otherwise of interventions was due to intersectoral action. They stated that the lack of evidence should not be interpreted to mean that intersectoral action on health determinants is ineffective and that "rigorous evaluations of intersectoral action are needed to strengthen the evidence base for this public health practice".</p>
<p>Lorenc T, Petticrew M, Welch V, et al. 2013. What types of interventions generate inequalities? Evidence from systematic reviews. Journal of Epidemiology and Community Health, 67(2), 190–93. http://jech.bmj.com/content/67/2/190.abstract</p> <p>A public health intervention may increase inequalities if it is of greater benefit to advantaged (low-risk) groups than to disadvantaged (high-risk) groups. This review involved a rapid review of systematic reviews to identify evidence on intervention-generated inequalities (IGIs) by socio-economic status (SES). The authors included any review of non-healthcare interventions in developed countries that presented data on differential effects of an intervention on health status or health behaviour outcome(s). They found that there was some evidence that media campaigns and workplace smoking bans increase inequalities between different SES groups, but that for many intervention types data on potential IGIs was lacking. There was some evidence that structural workplace interventions, provision of resources, and fiscal interventions, such as tobacco pricing, reduce health inequalities. The review authors stated that their findings were consistent with the belief that "downstream" preventive interventions are more likely to increase inequalities than "upstream" interventions. They also stated that, to increase the evidence base regarding IGIs, more consistent reporting of differential intervention effectiveness is needed.</p>

Bambra C, et al. 2010. **Tackling the wider social determinants of health and health inequalities: evidence from systematic reviews.** *Journal of Epidemiology and Community Health*, 64(4), 284–91.
<http://www.ncbi.nlm.nih.gov/pubmed/19692738>

This systematic review of systematic reviews (from developed countries, published from 2000 to 2007) assessed the health effects of any intervention based on the wider determinants of health (water and sanitation, agriculture and food, access to health and social care services, unemployment and welfare, working conditions, housing and living environment, education, and transport). Thirty reviews were identified. Only reviews with adult participants (16 years and over) were included. Generally, the effects of interventions on health inequalities were unclear. However, there was evidence to suggest that certain categories of intervention, particularly in housing and the work environment may have a positive impact on inequalities, or on the health of specific disadvantaged groups.

Smith KE, Bambra C, Joyce KE, et al. 2009. **Partners in health? A systematic review of the impact of organizational partnerships on public health outcomes in England between 1997 and 2008.** *J Public Health (Oxf)*, 31(2), 210–21. <http://jpubhealth.oxfordjournals.org/content/31/2/210.long>

The authors of this review defined public health partnerships as “organizational partnerships (of two or more organizational bodies), which aim to improve public health outcomes (through population health improvement and/or a reduction in health inequalities)”. To be included in this systematic review studies had to involve partnerships in England between 1997 and 2008, explicitly describe the public health partnership being evaluated (or assess a known public health partnership), and contain data on the impact of the partnership on public health outcomes (health improvement and/or reduction in health inequalities), either directly or indirectly.

The review authors identified fifteen studies, relating to six different interventions, meeting their criteria. Most of the included studies were not designed specifically to assess the impact of partnerships on public health outcomes. There were only four quantitative studies and these found mixed results on the impact of partnership working. The qualitative studies suggested that some partnerships raised the profile of health inequalities on local policy agendas. Due the design of both the partnership interventions and the studies evaluating them, the review authors found it difficult to determine the extent to which the success or otherwise of interventions was due to partnership working. They concluded that there was not yet any clear evidence for the effects of public health organisational partnerships on health outcomes and that better-designed evaluation studies were needed.

Lucas P, et al. 2008. **Financial benefits for child health and well-being in low income or socially disadvantaged families in developed world countries.** *Cochrane Database of Systematic Reviews*
doi:10.1002/14651858.CD006358.pub2 <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD006358.pub2/abstract>

This review assessed the effectiveness of direct financial benefits to socially or economically disadvantaged families in improving children's health, wellbeing and educational attainment. Nine RCTs, including over 25,000 participants, were included in the review. Eight studies assessed the effects of welfare reforms (changes to welfare payments including cash incentives such as negative taxation or income supplements combined with work support or requirement to work) and one study assessed a teenage pregnancy reduction programme. No effect was observed on child health, or on measures of child mental health or emotional state. Non-significant effects favouring the intervention group were seen for child cognitive development and educational achievement, and a non-significant effect favouring controls in rates of teenage pregnancy. While the authors did not find evidence to support the use of financial benefits as an intervention to improve child health, the conclusions were limited by the fact that most of the interventions had small effects on overall household income and were accompanied by strict conditions for receipt of payment. Gaps in the research evidence remain in the evaluation of unconditional payments of higher value, with high quality child outcome measures.

Oliver S, et al. 2008. **Health promotion, inequalities and young people's health: a systematic review of research.** London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.
<http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=2412>

This systematic review examined whether, and how, health promotion and public health research among young people has addressed inequalities in health. The researchers sought to identify how much research activity has addressed health inequalities among young people, what types of research have looked at gaps or gradients in health status, how much of this research specifically relates to socially disadvantaged young people, and how much of the research addresses the impact of structural interventions. The review identified 191 mostly observational studies. Most were conducted in the USA, examined physical health (inequalities research) or health behaviours (intervention research) and sampled broad populations rather than defined disadvantaged groups. Most studies did not explicitly aim to measure or reduce inequalities. Recommendations for researching interventions intended to reduce inequalities are made including: to investigate appropriate research methods; to conduct high quality outcome evaluations of interventions which compare outcomes between different groups, especially SES comparisons; to conduct such evaluations with vulnerable groups; rigorous evaluations of the effects of structural and social support interventions which earlier reviews have highlighted as having potential for reducing inequalities; and evaluations which can provide information on the implementation of interventions and their acceptability to young people and their families.

Other relevant publications

Pons-Vigues M, Diez E, Morrison J, et al. 2014. **Social and health policies or interventions to tackle health inequalities in European cities: a scoping review**. BMC Public Health, 14, 198. http://www.biomedcentral.com/1471-2458/14/198?utm_source=rss&utm_medium=rss&utm_campaign=social-and-health-policies-or-interventions-to-tackle-health-inequalities-in-european-cities-a-scoping-review

This review is based on a search in “PubMed” and “Sociological Abstracts” for articles published in scientific journals between 1995 and 2011 reporting on social or health policies or interventions in European cities where the interventions had reducing health inequalities as one of their objectives. The review authors identified 54 studies meeting their criteria. Forty were conducted in the UK, five in Spain, four in the Netherlands, two in Germany, one in France and two in multiple centres. The studies were of various designs and took place in various settings. The majority (46 interventions, 79%) were evaluated and 29 of them (53.7% of the total) had positive effects. The review authors noted that, although almost half of the interventions promoted healthy behaviours, health behaviours are not the main determinants of health inequalities.

Currie C et al., eds. 2012. **Social determinants of health and well-being among young people. Health Behaviour in School-aged Children (HBSC) study: international report from the 2009/2010 survey**. Copenhagen: WHO Regional Office for Europe. http://www.euro.who.int/_data/assets/pdf_file/0003/163857/Social-determinants-of-health-and-well-being-among-young-people.pdf?ua=1

This is the fifth report from the Health Behaviour of School-aged Children (HBSC) study. It reports on a survey of 200,000 young people aged 11–15 years in 43 countries across Europe and North America in 2009/10. This survey focused on the social and demographic determinants of young people’s health. The results for health and social indicators are presented by age and gender for each country and bar charts illustrate the relationships between family affluence and the various health and social indicators for each country by gender. In general, higher family affluence was associated with better health outcomes, health behaviours and positive social contexts in regard to family, peers and school. There was no clear pattern of health inequalities in risk behaviours such as alcohol use.

Mackenbach JP. 2011. **Can we reduce health inequalities? An analysis of the English strategy (1997–2010)**. J Epidemiol Community Health, 65(7), 568–75. http://hal.archives-ouvertes.fr/docs/00/62/82/75/PDF/PEER_stage2_10.1136%252Fjech.2010.128280.pdf

England was the first country in Europe to institute a systematic policy to reduce socio-economic inequalities in health. This paper offers an assessment of how well the strategy worked, and discusses what lessons can be learnt. In 2001 the Secretary of State for Health announced two inequalities targets: to lower the gap in gap in life expectancy between areas and the difference in infant mortality across social classes by 10% by 2010. The 2003 Department of Health strategy ‘Tackling health inequalities: a Program for Action’ set out the Government’s plans to achieve these targets. The author of this paper reviewed key documents, and analysed the entry points for policy (i.e. health determinants targeted), the specific policies chosen, policy implementation, changes in intermediate health outcomes and changes in final health outcomes. He concluded that despite some partial successes, the strategy failed to reach its targets because it did not address the most relevant entry points, did not employ effective policies and was not delivered on a large enough scale to achieve population-wide impacts. He stated that substantial reductions in health inequalities can only occur if governments have a democratic mandate to make the necessary policy changes, if policies that are demonstrably effective can be developed, and if such policies are implemented on a sufficiently large scale.

Currie J, Goodman J. 2010. **Parental Socioeconomic Status, Child Health, and Human Capital**. In Peterson P, Baker E, McGaw B (Eds.), International Encyclopedia of Education (3rd edition): Elsevier. <http://scholar.harvard.edu/files/joshuagoodman/files/parentalses.pdf>

This essay considers the evidence from developed countries for the effects of parental socioeconomic status (SES) on child health and for the effect of child health on future outcomes such as education. It cites evidence that differences in health between high and low SES children are apparent from birth and continue through early childhood and beyond. Low SES babies are more likely to have low birthweight and low SES children are more likely to have chronic health conditions and more likely to experience limitations as a result of their chronic conditions. Persistent poverty is likely to have worse health effects than temporary poverty and several studies have provided evidence for the greater effects of persistent (as opposed to current) poverty on child mental health, particularly aggressive behaviour. The authors discuss the evidence that low SES causes poor health and that interventions to improve parental SES improve child health. They report that there is very limited evidence for either proposition possibly because of the difficulty of finding interventions that affect parental SES but do not directly affect child health. They state that improving maternal education does seem to have a positive effect on child health possibly because better educated mothers receive better antenatal care, drink and smoke less and are more likely to be married. The authors concluded that there is strong evidence for the association between parental SES and both child health and educational outcomes but causality is difficult to prove.

Other relevant New Zealand publications

Hancock John. 2014. **Legislating to Reduce Child Poverty: considering the UK Child Poverty Act 2010 and its application to New Zealand. Report for Winston Churchill Memorial Trust Board.**

[http://www.communitymatters.govt.nz/vwluResources/WCMT-John-Hancock-report/\\$file/WCMT-John-Hancock-report.pdf](http://www.communitymatters.govt.nz/vwluResources/WCMT-John-Hancock-report/$file/WCMT-John-Hancock-report.pdf)

The principal function of the UK Child Poverty Act 2010 (CPA) is to reduce the numbers of UK children experiencing material deprivation, income poverty, “absolute” poverty and persistent poverty. For each of these poverty indicators, the CPA prescribes both a measure to be used and a target to be reached by 2020. In 2010, John Hancock travelled to the UK on a Churchill Fellowship to research the CPA. His research paper’s primary aim is to consider the impact the CPA has had on reducing child poverty in the UK. The first two sections consider the structure of the CPA and its impact while the third provides a summary of the New Zealand legislative context and considers ways of measuring child poverty. The final section assesses the lessons the CPA provides for New Zealand policy makers and offers some broad conclusions. The author found that the CPA had not been effective in reducing child poverty but it had resulted in the formal establishment of a policy framework sitting across the tiers of government and the establishment of the Social Mobility and Child Poverty Commission, thus adding to the infrastructure for monitoring child poverty and developing policy. Austerity measures introduced by the UK government in response to the financial crisis had a fundamental impact on the effectiveness of the CPA since these measures disproportionately affected low income households with children. The author considered that achieving a political consensus regarding the need for central government to implement a systematic policy approach to reducing child poverty may be the most challenging aspect of any initiative to develop legislation to reduce child poverty in New Zealand.

The Office of the Children’s Commissioner has published a research brief based on this research paper. This can be found here: <http://www.occ.org.nz/assets/Publications/OCC-Summary-Sheet-Legislating-to-Reduce-Child-Poverty.pdf> .

Office of the Children's Commissioner. 2013. **A framework for food in schools programmes in New Zealand**

Wellington: Office of the Children's Commissioner. <http://www.occ.org.nz/assets/Uploads/Reports/Poverty/A-framework-for-food-in-schools.pdf>

This working paper addresses the design and implementation of a collaborative food in schools programme, one of the 78 recommendations in the *Solutions to Child Poverty* report (see below). It discusses the evidence for a Government-supported framework and how the Government might partner with families, whānau, schools, communities and business. The paper concludes with a worked example of a possible policy framework for food programmes in New Zealand schools and early childhood education (ECE) services, based on the principles of partnership, best practice and proportional universalism.

Smith C, Parnell WR, Brown RC, et al. 2013. **Providing additional money to food-insecure households and its effect on food expenditure: a randomized controlled trial.** Public Health Nutrition, 16(08), 1507–15.

This paper reports on a RCT involving 214 low income households with children in Dunedin. Participants were recruited via newspaper advertising, flyers distributed at supermarkets, posters in schools and via invitations issued to participants in a previous study. It aimed to examine the effect of extra money (in the form of supermarket vouchers) on food expenditure in food-insecure households with children (≤18 years). The trial used a parallel design with a four week baseline phase followed by a four week intervention phase during which households were randomised to receive (or not) supermarket vouchers. The vouchers had a mean monetary value of \$17.00 per week. In the intervention phase the voucher group spent \$15.20 (95% CI 1.46–28.94, $p=0.030$) more per week on food than the control group. There was no difference between the intervention and control groups in spending on ‘fruit and vegetables’, ‘meat and poultry’ and ‘dairy’. All differences were non-significant and <\$1. The study authors concluded that providing money via supermarket vouchers to food-insecure households led to increased spending on food.

The Children's Commissioner's Expert Advisory Group on Solutions to Child Poverty. 2012. **Solutions to Child Poverty in New Zealand: Evidence for Action.** Wellington: Office of the Children's Commissioner.

<http://www.occ.org.nz/assets/Uploads/EAG/Final-report/Final-report-Solutions-to-child-poverty-evidence-for-action.pdf>

This report contains the recommendations from the Children’s Commissioner’s Expert Advisory Group (EAG) on solutions to child poverty. It also provides a picture of child poverty in New Zealand, reports on the feedback the EAG received on their Issues and Options paper (see below), and outlines the approach the EAG used to develop their recommendations. The 78 recommendations are intended to: address the causes and consequences of child poverty, be sensitive to the issues around children in sole parent families, and be informed by the best available evidence. They are grouped under the following headings: strategy and accountability; tax credits, benefits and income support; child support; employment, skills and training; housing; Māori children; Pasifika children; problem debt; health and disability; education; local communities and family; the justice system; research and evaluation and areas for further consideration.

Expert Advisory Group on Solutions to Child Poverty. 2012. **Solutions to Child Poverty in New Zealand: Issues and Options Paper for Consultation.** Wellington: Office of the Children's Commissioner.

<http://www.occ.org.nz/assets/Uploads/EAG/Options-paper/Issues-and-options-paper-for-consultation.pdf>

This report presents the initial package of proposals to reduce child poverty and mitigate its effects, developed by the Expert Advisory Group on Solutions to Child Poverty, established in March 2012 by the Children's Commissioner. The group examined international and New Zealand evidence on child poverty and its solutions, which is summarised in this document and available in a series of working papers on the website (the health policy working paper is available at: <http://www.occ.org.nz/assets/Uploads/EAG/Working-papers/No-17-Health-policy.pdf>). Proposals include: developing a standard approach to measuring child poverty; increased household incomes through changes to the child support and Family Tax Credit systems, a universal Child Payment and increasing parents' employment earnings; improvements in housing quality and affordability; and health and education system recommendations. Proposals for the health system include: improvements to maternity care to increase the uptake and early engagement of women from low socioeconomic backgrounds, especially teenagers, Māori and Pasifika, and integrated continuity of service from antenatal to age five; improved integration of health and social services for pre-school children; improved access to primary care; and youth health care through secondary schools.

Rowe Davies Research for Every Child Counts. 2012. **The Netherlands Study: Learning from the Netherlands to improve outcomes for New Zealand's children.** Wellington: Every Child Counts.

<http://www.everychildcounts.org.nz/news/the-netherlands-study-2/>

The Netherlands achieves high OECD rankings in child wellbeing outcomes, at relatively low cost compared to countries with similar outcomes. This report considers whether there are specific policies that contribute to these outcomes and have the potential to inform New Zealand's efforts to improve child wellbeing and status. The report found that a culture of respect for children and of the caring responsibilities of parents, combined with a universal approach to supporting parents, makes it easier for parents and children to access support when they need to and contributes to child wellbeing. Systematic, nationwide programmes appeared to be more widespread in the Netherlands. Differences in parental leave entitlement and work patterns, out-of-school rather than pre-school care, parent education and parent involvement in schools, generous housing assistance, rates of sole parenthood and teen parenthood, and historical difference in terms of colonisation were identified. The report makes a number of recommendations for New Zealand, including: expanding the reach of effective parent support and education programmes; expanding Plunket and well-child services to include access to practical help with childcare; developing effective services for mothers with post natal depression to improve their sensitivity to their infants; expanding the availability of out-of-school care; increasing statutory parental leave; and improving the effective provision of state-funded housing for parents.

Couchman J & Baker K. 2012. **One step at a time: Supporting families and whānau in financial hardship. A Families Commission research report.** Wellington: Families Commission.

<http://www.familiescommission.org.nz/publications/research-reports/one-step-at-a-time>

This report aims to assist the Families Commission in supporting families and whānau in financial hardship, by examining practices that community organisations use when working with families/whānau, and investigating how existing services can provide more effective support, to identify practical strategies for working with families/whānau. Five case studies of community organisations that have worked in partnership with the Families Commission were undertaken. These included interviews with family/whānau, staff, and other supportive organisations, hui, and focus groups. Findings included: building life skills and self-worth, and creating a less oppressive environment (through reducing the presence of fringe lenders, takeaways and alcohol outlets, and gambling machines) to improve health and reduce addictions, may be more effective than teaching 'financial education'; support is most effective when it is 'inside out' (driven from within a group or community), 'early intervention' may be seen as 'outside in' and the research suggested identifying 'opportunities for engagement', and to focus on building relationship networks from within a community, which can identify problems early would be helpful. Success factors included high-trust relationships, advocacy, promoting access to cultural, social, economic and environmental resources and the development of mana or self-esteem. A number of policy directions are identified.

Public Health Advisory Committee. 2010. **The Best Start in Life: Achieving effective action on child health and wellbeing.** Wellington: Ministry of Health. <http://nhc.health.govt.nz/resources/publications/best-start-life-achieving-effective-action-child-health-and-wellbeing>

This Public Health Advisory Committee report to the Minister of Health highlights that New Zealand ranks low in child health outcomes compared with other OECD countries, and there are wide disparities in the health outcomes of New Zealand children. It identifies four major improvements that are necessary across government and the health and disability sector to improve outcomes: strengthen leadership to champion child health and wellbeing; develop an effective whole-of-government approach for children; establish an integrated approach to service delivery for children; and monitor child health and wellbeing using an agreed set of indicators. Health sector recommendations include: prioritisation of, and increased spending on child health; development of DHB child health implementation plans with measurable outcomes and accountabilities; improved access to primary care; and ensuring a seamless transition from maternity services to health care services for infants.

Note: The publications listed above were identified using the search methodology outlines in **Appendix 1**

SOCIOECONOMIC AND CULTURAL DETERMINANTS



HOUSEHOLD COMPOSITION



CHILDREN IN SOLE PARENT HOUSEHOLDS

Introduction

Almost 30% of children in New Zealand live in sole parent families [43] and it is estimated that around one third of children experience some period of time living with only one parent [44]. Contrary to popular stereotypes, most children in sole parent families were not born to women living without partners and most sole parents are not teenagers. In 2006, the average age of sole parents was thirty-eight [45]. The “Growing Up in New Zealand” study found that 89% of their cohort of approximately 7,000 children from the greater Auckland and Waikato regions were, at two years of age, living with two parents, either in single or extended family households [46].

It is well-recognised that parental relationship breakdown has harmful effects on children, but there is debate about whether these effects stem from the breakdown itself or the multiple associated adversities, particularly poverty [47]. A 2009 literature review found consistent evidence for an association between parental relationship breakdown and socio-economic disadvantage, and also children’s psychological ill-health, physical ill-health, lower educational achievement, substance misuse and other health-damaging behaviours, and behavioural problems including conduct disorder, anti-social behaviour and crime. It noted that not all children experience these consequences and most adjust to their new situation after a period of instability, however, multiple relationship transitions are particularly detrimental for children [47].

Sole parent families are at high risk of poverty and poverty is both a consequence and a predictor of parental relationship breakdown [47]. The 2012–13 New Zealand Household Economic Survey found that 56% sole parent households with children were in poverty, compared to 14% of two parent households and 14% of other family households with children [5]. A study based on the 2006/07 New Zealand Health Survey investigated the relationship between sole parenting and children’s mental and physical health [48]. It found little or no association between being a child of a sole parent and physical health, but a stronger association with child mental health. However, after adjusting for both socio-economic factors (deprivation and housing) and maternal health, the odds ratio for having a low psychosocial health summary score was not statistically significant. The authors state that their findings support having policies to improve access to community mental health services for sole parents and their children and, especially, for having policies to ameliorate the disadvantaged economic circumstances of sole parent families.

The following section uses data from the 2001, 2006, and 2013 Censuses to review the proportion of children living in sole parent households.

Data Source and Methods

Definition

Proportion of children aged 0–14 years living in sole parent households

Data Source

Numerator: NZ Census: Number of children aged 0–14 years living in sole parent households, where the child was home on Census night.

Denominator: NZ Census: Total number of children aged 0–14 years who were home on Census night

Notes on Interpretation

The breakdown into “Couple with Children” and “One Parent with Children” is made without regard to the relationship between the child and caregiver (e.g. a couple with children may refer to a de-facto couple, a married couple, grandparents caring for a dependent grandchild, a mother living with a partner who is not the child’s biological parent) and thus may underestimate the proportion of children who have experienced parental separation, as well as the proportion living in blended family settings.



New Zealand Distribution and Trends

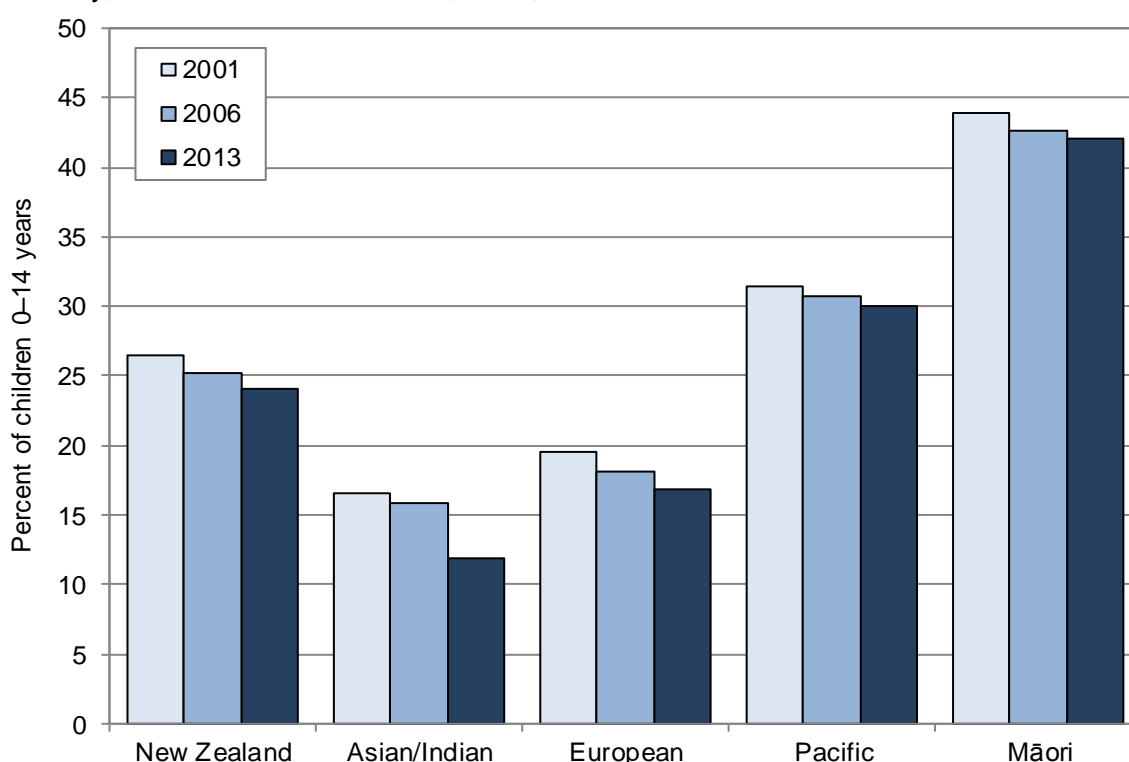
New Zealand Trends

In New Zealand, the proportion of children living in sole parent households declined from 26.4% in 2001 to 24.1% in 2013 (Figure 46).

Distribution by Ethnicity

At the 2013 Census, 42.0% of Māori and 30.1% of Pacific children lived in sole parent households compared to 16.8% of European and 11.9% of Asian/Indian children. The proportion of Māori and Pacific children living in sole parent households was *significantly higher* than for European children. In contrast, rates for Asian/Indian children) were *significantly lower* (Figure 46, Figure 48, Table 13). However, the proportion of children living in sole parent households declined slightly for all ethnic groups between 2001 and 2013.

Figure 46. Percentage of children aged 0–14 years living in sole parent households by ethnicity, New Zealand at the 2001, 2006, and 2013 Censuses



Source: Statistics New Zealand; Note: ethnicity is level 1 prioritised

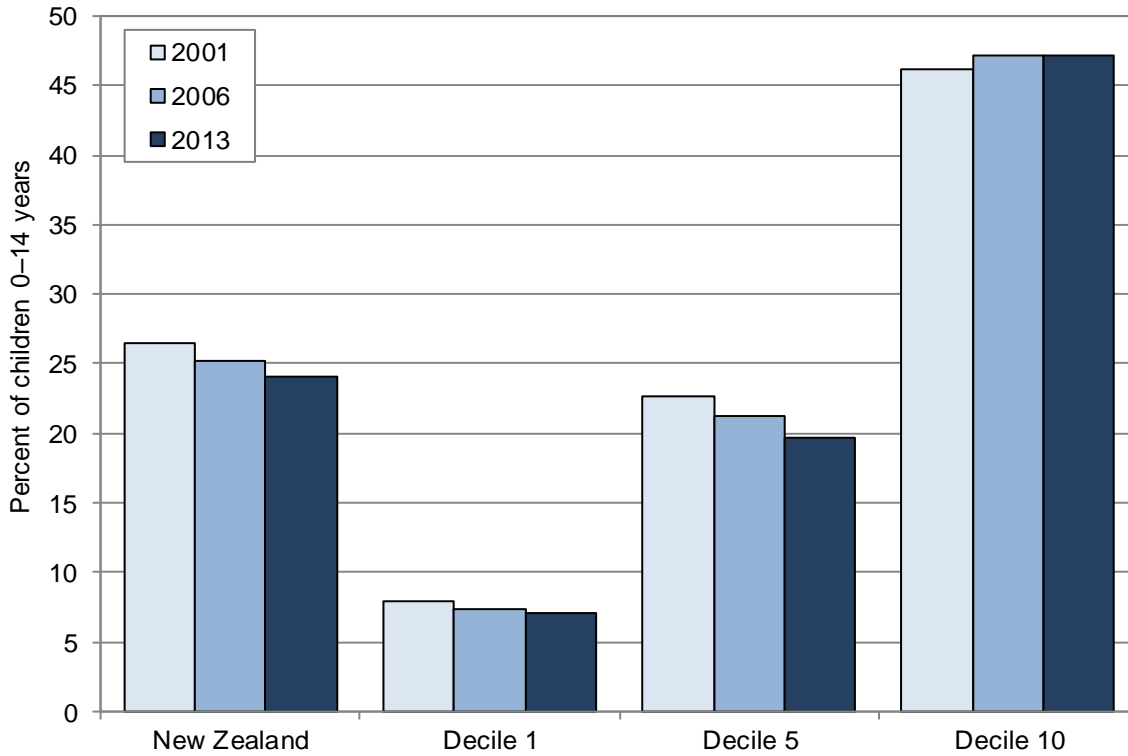
Distribution by NZ Deprivation Index Decile

At the 2013 Census, the proportion of children living in sole parent households ranged from 7.0% for those in the least deprived areas (NZDep decile 1), to 47.1% for those in the most deprived areas (NZDep decile 10). The rate for children in the most deprived areas was more than six times higher than the rate for children in the least deprived areas (Figure 47, Figure 48, Table 13).

Distribution by Ethnicity and NZ Deprivation Index Decile

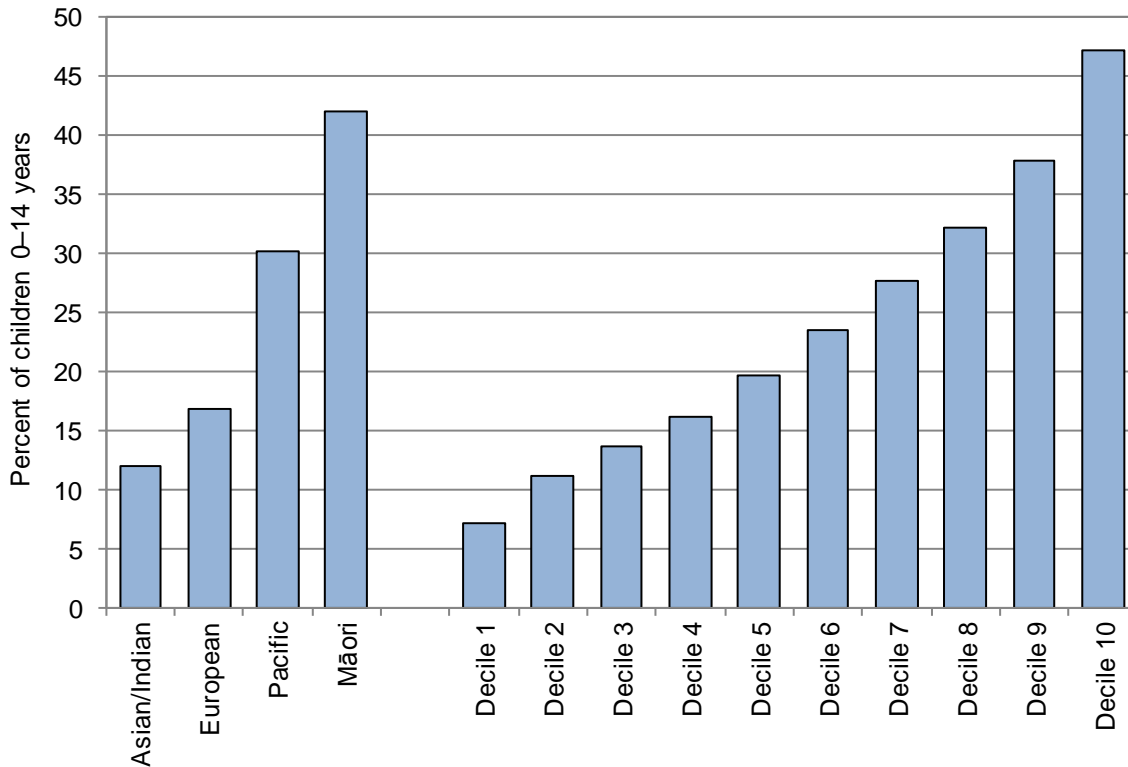
At the 2013 Census, the proportion of children living in sole parent households increased with increasing NZDep deprivation for each of New Zealand's largest ethnic groups. At each level of NZDep deprivation a higher proportion of Māori than European or Asian/Indian children lived in sole parent households. For Pacific children, rates in the least deprived areas (NZDep decile 1–2) were similar to those of Māori children. However in more deprived areas (NZDep decile 8–10), rates for Pacific children were more similar to those of European children (Figure 49).

Figure 47. Percentage of children aged 0–14 years living in sole parent households by NZ Deprivation Index decile, New Zealand at the 2001, 2006, and 2013 Censuses



Source: Statistics New Zealand; Note: decile is NZDep13

Figure 48. Percentage of children aged 0–14 years living in sole parent households by ethnicity and by NZ Deprivation Index decile, New Zealand at the 2013 Census



Source: Statistics New Zealand; Note: ethnicity is level 1 prioritised; decile is NZDep13

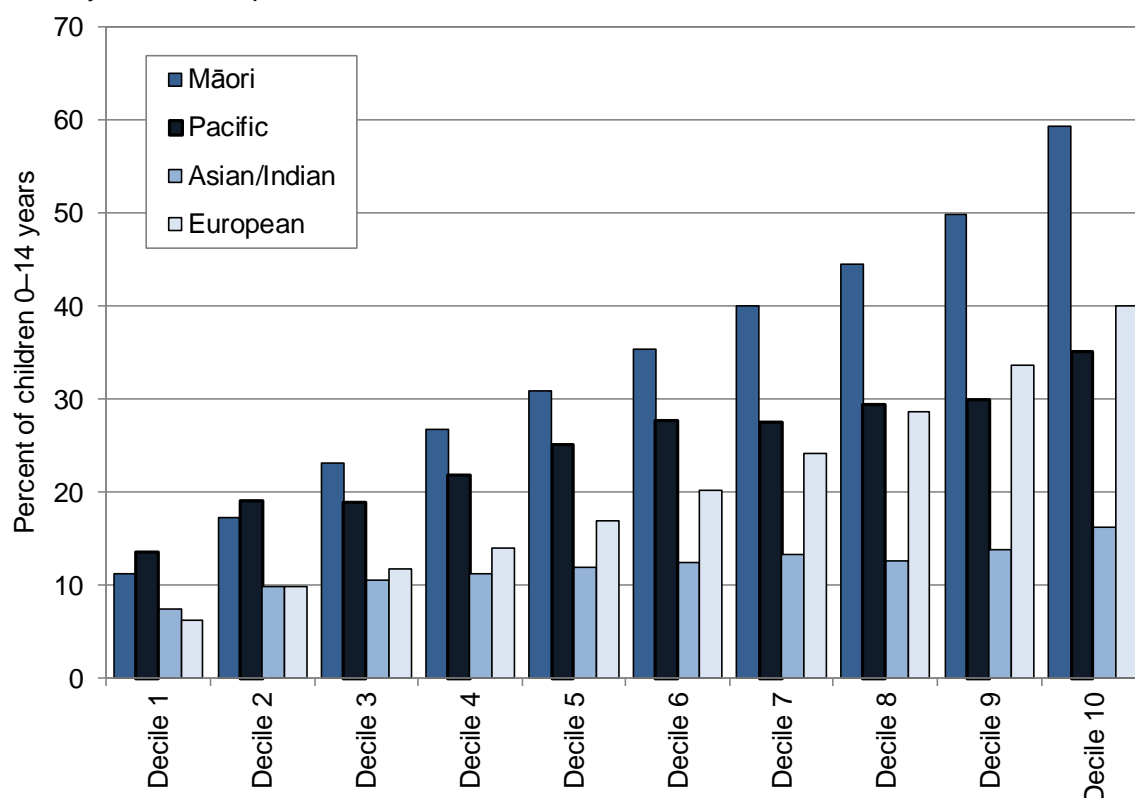


Table 13. Children aged 0–14 years living in sole parent households by ethnicity and NZ Deprivation Index decile, New Zealand at the 2013 Census

Variable	Number of children	Percent of children	Rate ratio	95% CI
Ethnicity				
Māori	82,476	42.0	2.50	2.48–2.52
Pacific	22,506	30.1	1.79	1.77–1.81
Asian/Indian	10,437	11.9	0.71	0.70–0.72
European	72,297	16.8	1.00	
NZ Deprivation Index Decile				
Decile 1	6,045	7.0	1.00	
Decile 2	9,156	11.1	1.57	1.53–1.62
Decile 3	10,710	13.6	1.93	1.87–1.99
Decile 4	12,474	16.2	2.29	2.23–2.36
Decile 5	14,973	19.6	2.79	2.71–2.87
Decile 6	17,622	23.4	3.32	3.23–3.41
Decile 7	20,529	27.6	3.91	3.81–4.02
Decile 8	24,702	32.1	4.56	4.44–4.68
Decile 9	31,971	37.7	5.36	5.22–5.50
Decile 10	47,955	47.1	6.68	6.52–6.85

Source: Statistics New Zealand; Note: ethnicity is level 1 prioritised; decile is NZDep13

Figure 49. Percentage of children aged 0–14 years living in sole parent households by ethnicity and NZ Deprivation Index decile, New Zealand at the 2013 Census



Source: Statistics New Zealand; Note: ethnicity is level 1 prioritised; decile is NZDep13

Northern DHBs Distribution and Trends

Northern DHBs Distribution

At the 2013 Census, 32.5% of Northland, 19.8% of Waitemata, 20.1% of Auckland and 27.6% of Counties Manukau children lived in sole parent households, with the proportion in Northland and Counties Manukau being *significantly higher* than the New Zealand rate and the proportion in the Waitemata and Auckland DHBs being *significantly lower* (Table 14).

Table 14. Children aged 0–14 years living in sole parent households, Northern DHBs vs. New Zealand at the 2013 Census

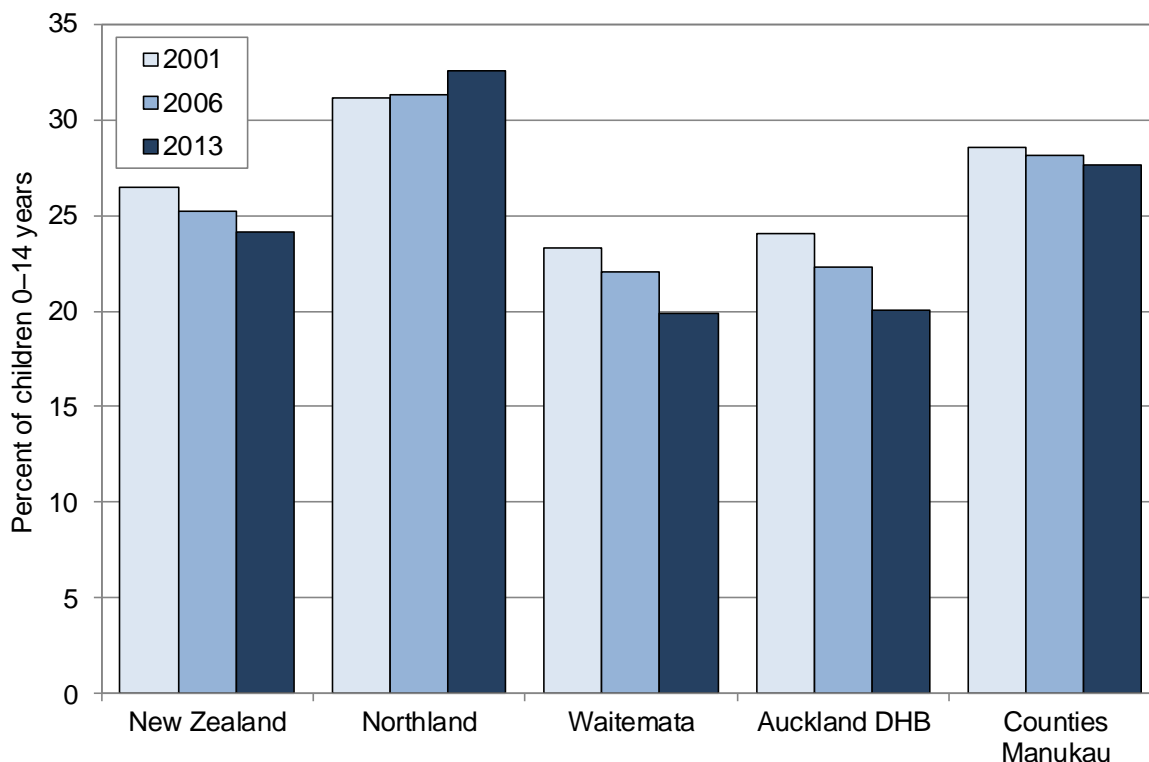
DHB	Number of children	Percent of children	Rate ratio	95% CI
Children 0–14 years living in sole parent households				
Northland	9,795	32.5	1.35	1.33–1.37
Waitemata	20,397	19.8	0.82	0.81–0.83
Auckland	14,817	20.1	0.83	0.82–0.84
Counties Manukau	29,427	27.6	1.15	1.13–1.16
New Zealand	196,185	24.1	1.00	

Source: Statistics New Zealand

Northern DHB Trends

In the Waitemata, Auckland and Counties Manukau DHBs the proportion of children living in sole parent households declined between the 2001 and 2013 Censuses, although the magnitude of this change was not as marked in Counties Manukau as in the other two DHBs. In Northland, the proportion of children in sole parent households was higher in 2013 than it was in 2001 (Figure 50).

Figure 50. Percentage of children aged 0–14 years living in sole parent households, Northern DHBs vs. New Zealand at the 2001, 2006, and 2013 Censuses



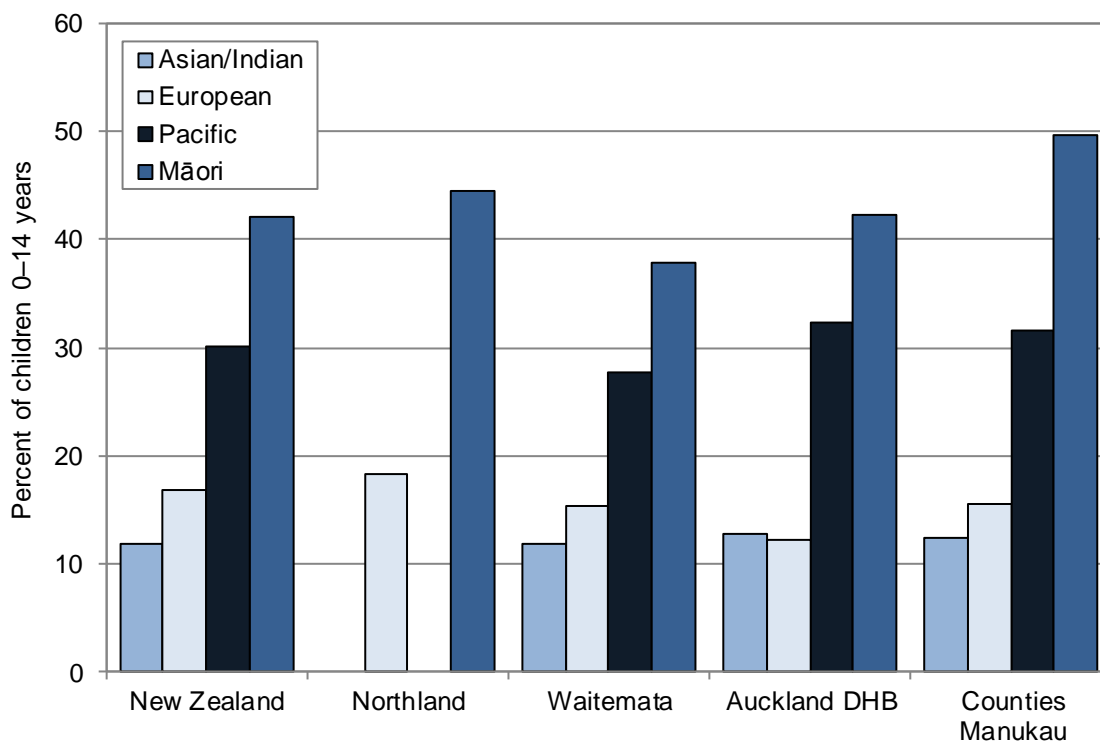
Source: Statistics New Zealand



Distribution by Ethnicity

In the Waitemata, Auckland and Counties Manukau DHBs a higher proportion of Māori > Pacific > European and Asian/Indian children lived in sole parent households at the 2013 Census, while in Northland a higher proportion of Māori than European children lived in sole parent households (**Figure 51**).

Figure 51. Percentage of children aged 0–14 years living in sole parent households by ethnicity, Northern DHBs vs. New Zealand at the 2013 Census



Source: Statistics New Zealand; Note: Ethnicity is level 1 prioritised



Local Policy documents, reviews and research relevant to the composition, formation, and dissolution of New Zealand families

There is little guidance for health professionals in New Zealand on dealing with children undergoing changes in family composition. **Table 15** (below) provides an overview of recent Ministry of Social Development and Families Commission publications relating to family composition and resilience in separated, solo parent and step-parent families, and some relevant recent research publications.

Table 15. Local policy documents, reviews and research relevant to the composition, formation, and dissolution of New Zealand families

New Zealand policy documents and literature reviews
<p>Social Policy Evaluation and Research Unit. 2014. Families and whānau status report 2014. Wellington: Families Commission. http://www.familiescommission.org.nz/publications/research-reports/families-and-wh%C4%81nau-status-report-2014</p> <p>The main purpose of this report is to set out the proposed Family and Whānau Wellbeing Frameworks and discuss how these will be used to measure and monitor family and whānau wellbeing. The Families Commission has developed two frameworks that reflect the different cultural conceptualisations of family and whānau in non-Māori and Māori communities, and also the different conceptualisations of 'wellbeing'. Chapter 3 draws on selected questions from the General Social Survey (2008, 2010, 2012) to comment on changing aspects of wellbeing by family type. One parent families were found to be much less satisfied with their lives as a whole and particularly with their physical health and safety and economic well-being, than couples with or without children. In 2012, 70% of two-parent families had an income of >\$70,000, but only 24% of one-parent families did. Chapter 4 outlines the proposed Whānau Wellbeing Framework and uses existing Census, GSS and administrative data, to undertake a preliminary examination of trends in whānau wellbeing during 1981–2012. Māori one-parent families showed improvements in education and employment but, in 2012, only 20.7% of one-parent families assessed their incomes as “enough” or “more than enough” to meet their everyday needs, compared to 44.5% of couples with children. (Māori children living with a non-Māori parent were excluded from the analyses presented in this part of the report.) Chapter 6 uses the longitudinal Survey of Family, Income and Employment to examine how the living arrangements of a cohort of adults and children changed over the eight years of the survey (2003–10). Over the eight years, about one third of dependent children lived with one parent only at some stage. Fifty percent of Māori children experienced living with only one parent. Chapter 7 discusses issues of wellbeing in Pacific Island families, drawing on the Pacific Islands Families Study—a longitudinal study following an initial cohort of 1,376 Pacific mothers and 1,398 infants born at Middlemore Hospital between 15 March and 19 December 2000. In 2011, 85% of Pacific people lived in a household of five or more people and 31% lived in a household of eight or more. The final chapter sets out the Commissions plans for future work on the Family and Whānau Wellbeing Frameworks. This report was published before the full data from the 2013 census was available.</p>
<p>Morton S M B, Atatoa Carr P E, Grant C C, et al. 2014. Growing Up in New Zealand: A longitudinal study of New Zealand children and their families. Now we are Two: Describing our first 1000 days. Auckland Growing Up in New Zealand. http://www.growingup.co.nz/pdf/reports/report03.pdf</p> <p>This is the third report from the Growing up in New Zealand Study, a longitudinal study following 7,000 children and their families in the greater Auckland and Waikato regions. The report highlights the diversity of families and environments that New Zealand children are growing up in. It shows that at least one third of families moved at least once during the period and a significant number of mothers either formed a new relationship or became newly alone after the end of a relationship. At two years old, 69% of the cohort lived with two parents alone, 20% with two parents and extended family, 5% with a lone parent and 6% with one or both parents plus other non-kin adults. The number who lived in extended family households varied with ethnicity: 43% of Pacific, 27% of Asian, 27% of Māori and 14% of European children.</p>
<p>Robertson J. 2014. Addressing the challenges of stepfamily life. Wellington: Families Commission. http://www.familiescommission.org.nz/sites/default/files/downloads/Addressing-Challenges-Stepfamily-Life.pdf</p> <p>In New Zealand round one in ten families with children is a stepfamily and around a third of all children spend some of their childhood as part of a stepfamily. This study aimed to identify the major challenges of stepfamily life and the strategies that families use to deal with these challenges. It involved using a questionnaire to interview members of 44 stepfamilies who had been together for at least five years and had at least one child over the age of eight years. Families were selected to provide equal numbers of blended and non-blended families, some Māori and Pacific families, and families of varying socio-economic status. Four issues were identified by at least two-thirds of parents or step parents: how to discipline the children and who would be responsible for doing it, getting agreement on household rules and routines, dealing with the “external influence” of non-resident parents, and having enough time to develop the couple relationship. Parents and step-parents used a range of strategies to address these issues. They stressed the importance of good communication, being flexible and adaptable, and having a strong couple relationship.</p>

Centre for Social Research and Evaluation. 2010. **Sole parenting in New Zealand: An update on key trends and what helps reduce disadvantage**. Wellington: Ministry of Social Development. <http://www.msdc.govt.nz/about-msdc-and-our-work/publications-resources/research/sole-parenting/index.html>

This report draws together the findings from a cross-agency research programme which aimed to improve the knowledge base for public policy by increasing understanding of the vulnerability to disadvantage among some sole-parent families, identifying sources of resilience and identifying policies and interventions that are effective in reducing vulnerability and building resilience. Findings included: significantly higher poverty rates among sole parents and their children than two-parent families; higher levels of mental health problems among sole parents, associated with both socioeconomic position and not have a co-resident adult; significant associations between time spent receiving benefits in young adulthood and a range of disadvantages in childhood and adolescence. The report includes a literature review addressing approaches and interventions, focusing on measures to promote better mental health, measures to reduce disadvantage early in the life course, and measures to improve support for vulnerable young parents.

Families Commission. 2010. **Economic wellbeing of sole-parent families**. Wellington: Families Commission. <http://www.familiescommission.org.nz/sites/default/files/downloads/Economic-Wellbeing-of-sole-parent-families.pdf>

This article provides a snapshot of the economic situations of sole-parent families, based on the 2006 census, and reports on previous research done by the Families Commission. It notes that in 2006, contrary to stereotypes, the average age of sole parents was 38, over half of sole parents were employed in paid work, and about a third were in full-time paid employment. The median income for solo parent households, from all sources was considerably less than that of two-parent families (\$27,400 vs. \$75,600). Thirty-six percent of sole parents owned their own home compared to two thirds of two-parent families. Flexible working hours made it easier for sole parents to fulfil their care responsibilities and also participate in the workforce but, for some mothers, choosing a job with flexibility meant accepting a job which did not utilise their skills and qualifications. Compared to mothers in two-parent families, sole mothers were more likely to have no educational qualifications (29% vs. 14%). Sole mothers without qualifications were more likely to be on the DPB. Sole parents used more child care than two-parent families and faced difficulties accessing suitable childcare because of cost, quality and supply. School holiday care was often a problem. In 2006, 11% of sole parent families had no motor vehicle, compared to only 1% of two-parent families. Living in a multi-family household was associated with significantly lower poverty rates, and improved health and social well-being, but could also be associated with crowding and family conflict. Māori, Pacific and Asian sole-parent families were more likely to live in multi-family households. The report's authors stated that policy makers need to be aware of the diverse economic situations of sole parent families to ensure that policy proposals have the desired effect of improving economic wellbeing of this vulnerable group.

Families Commission. 2009. **Separated Parenting - What separating parents need when making care arrangements for their children**. Wellington: Families Commission.

<http://www.familiescommission.org.nz/publications/briefs-and-statistics/issues-paper-01-separated-parenting>

This paper discusses the challenges facing separated parents when deciding on care, contact and financial arrangements for their children. It is based on Families Commission research and a literature review, and was published to inform a review of the Child Support Scheme that was due to take place. Research confirmed that parents who were able to cooperate and make arrangements by themselves (without having these arrangements imposed by the Family Court or Inland Revenue), were more satisfied with the arrangements they made for their children than those with imposed arrangements. The importance of information and support (which is often informal) is highlighted and the development of a unified information and support strategy is suggested. The report recommends a more equitable formula for calculating child support payments to reduce perceived unfairness in the scheme.

Families Commission. 2008. **The Kiwi Nest: 60 years of change in New Zealand families**. Wellington: Families Commission. <http://www.familiescommission.org.nz/sites/default/files/downloads/kiwi-nest.pdf>

This report aims to describe how families have changed over approximately 60 years, identify the pressures on families that influence their functioning and individual outcomes, and consider the implications of family change for New Zealand. The report describes current family forms (based on 2006 Census data), working patterns, incomes and housing and finds that family forms, sources of income, individual roles in families and the availability of housing have changed markedly over the past 60 years. However, the family's central function of bearing, raising and nurturing children remains constant. The report concludes that policies that are family centred and can reach families in all their diversity are essential for families to thrive and both produce and nurture future generations.

Robertson J, et al. 2006. **Review of the Empirical Literature Assessing the Impacts of Government Policies on Family Form: A report for the Families Commission.** Wellington: Families Commission.
<http://www.familiescommission.org.nz/sites/default/files/downloads/empirical-lit.pdf>

This systematic review considered the effects of government policies on partnership formation, dissolution and reconstitution, fertility decision-making and family size, and family living arrangements. Research published between 1990 and 2005, and judged to be relevant to New Zealand's social, economic and political context, was included in the review. A range of caveats to attempts to draw conclusions from the research were identified, including difficulties generalising findings across contexts, countries and cultures, the limited follow up periods of many studies, and the difficulties establishing cause and effect, or causal mechanisms. For example, although there is evidence that no-fault divorce laws precede a rise in divorce rates, it is unclear whether these laws cause a rise in divorce levels, or whether more separations are formalised after the advent of no-fault divorce. There is limited and conflicting evidence regarding legislation relating to custody, child welfare and adoption. Overall, the review found that government policy is not the main driver of the recent demographic changes that have occurred in many Western countries. Instead, it is likely that the broader social and economic context, and individual values, preferences and attitudes are more important influences on family form, and these factors may interact in complex ways with legislation and policy.

Other relevant publications

Meier Richard. 2013. **Relationships: the missing link in public health: A report by the Relationships Alliance in association with the All Party Parliamentary Group for Strengthening Couple Relationships.** The Relationships Alliance. <http://knowledgebank.oneplusone.org.uk/wp-content/uploads/2014/03/Relationships-the-missing-link-in-public-health.pdf>

This report argues that the quality of people's relationships has a fundamental impact on their health and well-being throughout their lives and that if frontline health practitioners see concern for the quality of people's relationships as part and parcel of their everyday work they can make significant improvements in many areas of public health where outcomes have long been poor. These areas include child poverty, parental alcohol/substance abuse, depression and mental health, obesity and child obesity, children's mental health and cognitive development and infant attachment. The report emphasises that the quality of relationships is more important than family type or structure and that stable families and good relationships between partners result in positive outcomes for families. It states that an approach to public health which acknowledges the importance of relationships must be underpinned by a range of support services including relationship education and marriage preparation services; support for relationships through frontline staff who see this as core part of their work; relationships-focused parenting programmes; and relationship counselling and therapy for couples experiencing difficulties and distress. Although this report is not a systematic review of the evidence, the report's authors state that they did seek the most robust evidence where possible.

O'Brien M. 2012. **Lone parents working for welfare in New Zealand.** *Local Economy*, 27(5–6), 577–92.
<http://lec.sagepub.com/content/27/5-6/577.abstract>

Once their youngest child turns five, sole parents on the DPB are expected to look for part-time work of at least 15 hours per week. This article addresses two important questions relating to paid work and sole parents. Firstly, it examines what is known about the background, circumstances and characteristics of lone parents receiving benefits in order to assess how well the skills and backgrounds of these parents fit the demands of the labour market, and, secondly, it examines what is known about the characteristics of the labour markets in which sole parents seek jobs. The author reports that research undertaken by the Centre for Research, Evaluation and Social Assessment (CRESA) has indicated that sole parents receiving main benefits are more likely than the general population to live in highly deprived areas and to have few or no qualifications. He notes that most of the growth in jobs over the five years from 2010 is expected to be in jobs requiring skills and experience. He also notes that unskilled jobs are often casual, part time, on contract or temporary and therefore "precarious" and "dead end" with no prospects for advancement of skills or pay. He concludes that a narrow and unrelenting focus on paid work will not improve the quality of life on a benefit for parents or children.

Tobias M, Kokaua J, Gerritsen S, et al. 2010. **The health of children in sole-parent families in New Zealand: results of a population-based cross-sectional survey.** *Australian and New Zealand Journal of Public Health*, 34(3), 274–80.
<http://dx.doi.org/10.1111/j.1753-6405.2010.00526.x>

This study used data from the 2006/07 New Zealand Health Survey to investigate whether children in sole-parent families in New Zealand have higher risks of mental and physical ill health than children of partnered mothers. It found that there was little or no association between being a child of a sole parent and physical health after adjusting for maternal health and family socio-economic disadvantage (using logistic regression), but there was a stronger association with child mental health. Children of sole mothers were more than twice as likely as children of partnered mothers to have a low psychosocial health summary score (PsS): odds ratio 2.35, 95% CI 1.76 to 3.15, $p < 0.0001$. After adjusting for demographic variables only, they were still twice as likely to have a low PsS score. When both socio-economic (deprivation, housing) and maternal health status variables were included in the model, the odds ratio was reduced to 1.41 (95% CI 0.97 to 2.07, $p = 0.08$) which was not statistically significant. The study authors stated that their findings support policies to improve access to community mental health services for sole parents and their children and, especially, policies to ameliorate the disadvantaged economic circumstances of sole parent families.

Coleman L, Glenn F. 2009. **When couples part: Understanding the consequences for adults and children.** London: OnePlusOne. <http://www.oneplusone.org.uk/wp-content/uploads/2012/03/WHEN-COUPLES-PART-FINAL-VERSION.pdf>

This literature review presents evidence relating to the impacts of couple relationship breakdown on adults and children, and associated issues such as mechanisms behind the impacts and variations in outcomes, and the economic costs of relationship breakdowns. Chapters 5 and 6 deal with the impacts of couple relationship breakdown on children. There was extensive and consistent evidence on the association of couple relationship breakdown and poor child outcomes, including poverty and socio-economic disadvantage (especially), psychological ill-health, physical ill-health, lower educational achievement, substance misuse and other health-damaging behaviours, and behavioural problems including conduct disorder, anti-social behaviour and crime. Longitudinal cohort studies provided evidence for long-term effects in some children, including socio-economic disadvantage in later life, cohabitation or marriage at an early age, teenage pregnancy, and increased risk of their own marital breakdown. Not all children experience these adverse effects, however, and most adjust to their new situation after a period of instability. The review found that multiple relationship transitions are particularly detrimental to children. Parental conflict, particularly destructive or violent conflict, is harmful for children although, paradoxically, divorce where there has been low pre-divorce conflict (as compared to high pre-divorce conflict) has been shown to have worse effects on children's health and well-being. This may be because in a low-conflict situation children are unprepared for divorce and may blame themselves for it.

Mooney A, Oliver C, Smith M. 2009. **Impact of family breakdown on children's well-being Evidence review.** London: Thomas Coram Research Unit, Institute of Education, University of London
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/222096/DCSF-RR113.pdf

This review was carried out for the Department for Children, Schools and Families in the UK. It found that that children who have experienced parental separation have, on average worse educational achievement, mental health, self-concept, social competence and long term health than children from intact families, but the effect size is small, reflecting the wide variety of experiences in both groups of children. Stepfamilies which include the father's as well as the mother's children tend to experience more adjustment problems. Financial hardship, and the stress it causes, is both a consequence and a cause of family breakdown. Repeated transitions from two biological parent family, to lone parent, to stepfamily status, and so on, can result in moving house and changing school each time, and these multiple changes increase the risk of negative child outcomes. Children cope better when they are well-prepared and well-informed, and when they receive competent and warm parenting, their parents have good mental health, there is low parental conflict and cooperative parenting post-separation and when they have good social support from grandparents and friends. The review found some evidence suggesting that interventions designed to reduce maternal depression can be effective, that school-based support programmes are beneficial (although not all children are comfortable talking about their family situation at school), and that divorce education and custody mediation programmes can be effective (although this evidence came from the US where such programmes are often compulsory).

Note: The publications listed above were identified using the search methodology outlines in **Appendix 1**

HOUSEHOLD CROWDING

Introduction

Household crowding was identified as a health issue in New Zealand in the 1920s, when census data were used to identify the proportion of New Zealanders for whom the household composition challenged “health and decency” [49]. Evidence from recent research suggests that living in a crowded household in childhood may negatively affect aspects of health in adulthood [50].

In New Zealand, household crowding has been linked to meningococcal disease and acute rheumatic fever in children [51,52]. Internationally, research has suggested correlations between crowding and tuberculosis, respiratory infections, hepatitis B and other enteric disease, conjunctivitis, and poor mental health outcomes [53]. Proposed mechanisms for these associations include closer, more prolonged and increased frequency of contact between children and people with infectious diseases, and increased exposure to second-hand tobacco smoke [53].

Crowding is more common among low-income households, households in rental accommodation (particularly state owned rental accommodation), younger households, single parent households, households with more dependent children, and households that include two or more families [54]. Māori and Pacific people are more likely than NZ Europeans to live in rental properties, and home ownership declined more substantially for Māori and Pacific peoples than for NZ Europeans between 1991 and 2006 [55]. Research suggests that rental accommodation tends to be of lower quality than owner-occupied homes, and more likely to lack insulation and to be prone to damp and mould [56].

The following section uses data from the 2001, 2006, and 2013 Censuses to review the proportion of children living in crowded households (households requiring one or more extra bedrooms to meet the people-per-bedroom criteria below).

Data Source and Methods

Definition

The proportion of children aged 0–14 years living in crowded households, as defined by Statistics New Zealand, using the Canadian National Occupancy Standard

Data Source

Numerator: Census: The number of children aged 0–14 years living in households which required one or more additional bedrooms.

Denominator: Census: The total number of children aged 0–14 years living in households at the Census for whom crowding status was known.

Notes on Interpretation

Note 1: Information is for the usual resident population and relates to the household crowding status of individual children. Thus the number of children reported on will be greater than the number of households on Census night (e.g. two children from the same household will be counted twice in these statistics).

Note 2: The Canadian National Occupancy Standard (CNOS) definitions were developed in Canada in the 1980s to enable the calculation of person-to-bedroom ratios for households of differing sizes and compositions [57]. Using the CNOS, Statistics New Zealand defines household crowding as a deficit of at least one bedroom according to the standard of: no more than two people per bedroom; couples can share a room; children under 5 of either gender or under 18 years of the same gender can share a room; children aged 5 to 17 years should not share a room with a child under 5 of the opposite gender; single adults and unpaired children should have a separate room [57].

The CNOS was used in the 2001, 2006, and 2013 NZ censuses, and households were reported as having two plus, one or no bedrooms spare, or as requiring an additional one, or two plus bedrooms. Households needing one or two plus additional bedrooms are deemed to be crowded [57].

Note 3: The NZ Deprivation Index uses household crowding as one of the nine variables to create its Deprivation Scores. Household crowding can therefore be expected to exhibit a social gradient by NZDep. However, it is the degree of the crowding experienced by children in each NZDep decile which is likely to have the greatest impact on their housing related health outcomes.



New Zealand Distribution and Trends

Distribution by household bedroom requirements

At the 2013 Census, 16.6% of New Zealand children aged 0–14 years lived in households with two or more spare bedrooms, while 35.8% lived in households with one spare bedroom. A further 10.7% lived in households requiring one additional bedroom, while 5.1% lived in households requiring two or more additional bedrooms (**Figure 52**).

New Zealand Trends

The proportion of New Zealand children living in crowded households (i.e. households requiring one or more additional bedrooms) did not change markedly between Censuses. It was 16.2% in 2001, 16.4% in 2006 and 15.8% in 2013 (**Figure 53**).

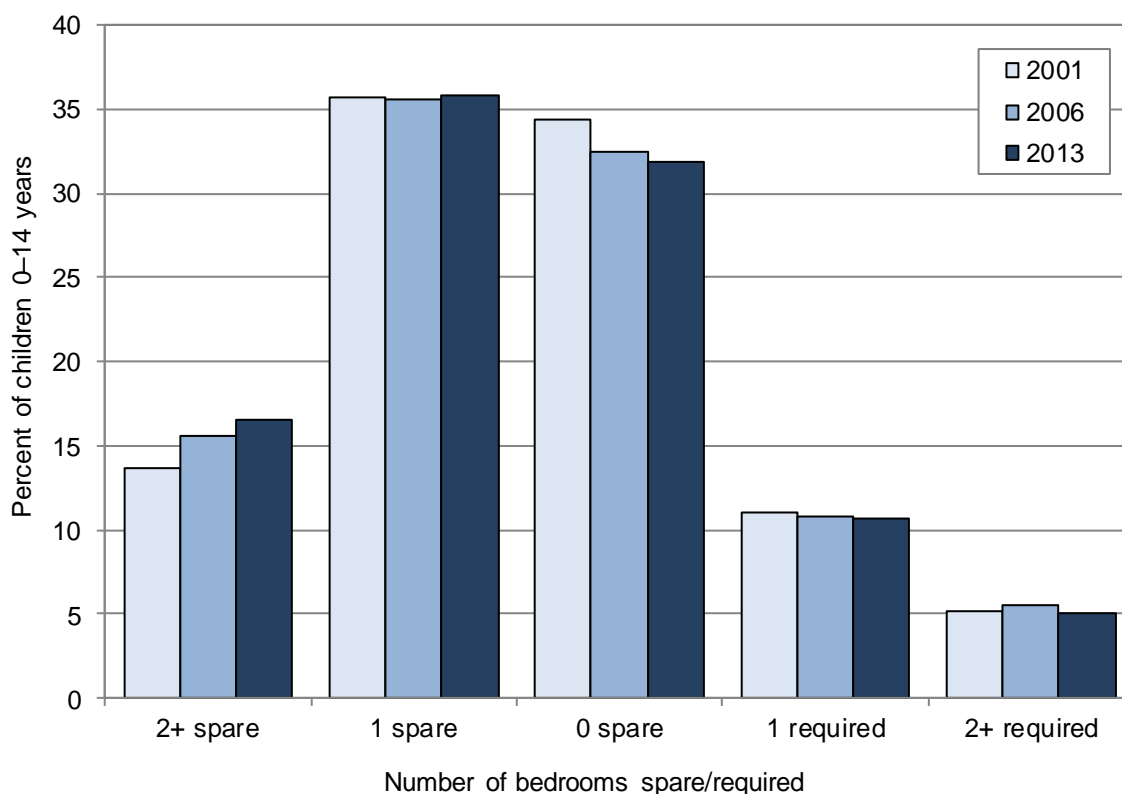
Distribution by Ethnicity

At the 2013 Census, 24.8% of Māori and 46.8% of Pacific children lived in crowded households, compared to 20.8% of Asian/Indian and 4.8% of European children. Household crowding rates for Pacific, Māori and Asian/Indian children were *significantly higher* than for European children (**Figure 53, Table 16**). Household crowding rates for children of all ethnic groups declined slightly between 2001 and 2013.

Distribution by NZ Deprivation Index Decile

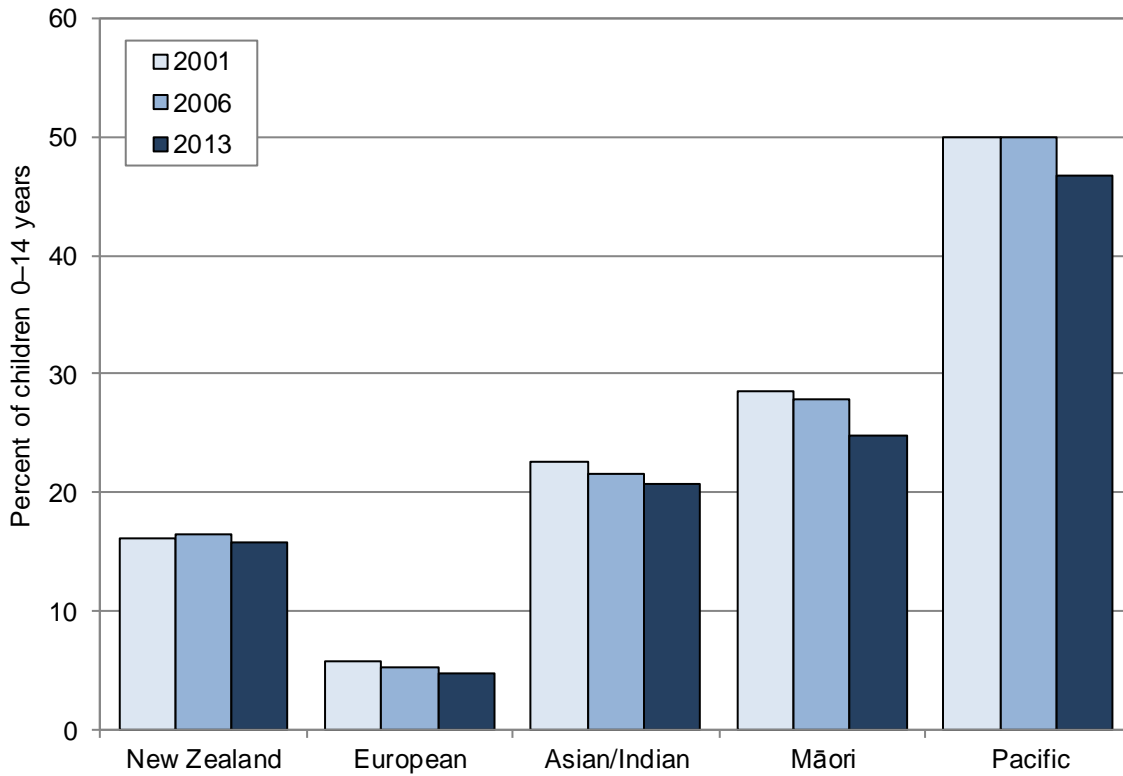
At the 2013 Census, the proportion of children living in crowded households increased with increasing deprivation, from 2.1% for those in the least deprived areas (NZDep decile 1) to 42.8% for those in the most deprived areas (NZDep decile 10). Crowding rates for children in the areas with the most deprived NZDep scores were over 20 times higher than for children in the least deprived areas (**Figure 54, Table 16**). See Note 3 in Methods box for further interpretation.

Figure 52. Percentage of children aged 0–14 years by the number of bedrooms spare or required in their household, New Zealand at the 2001, 2006 and 2013 Censuses



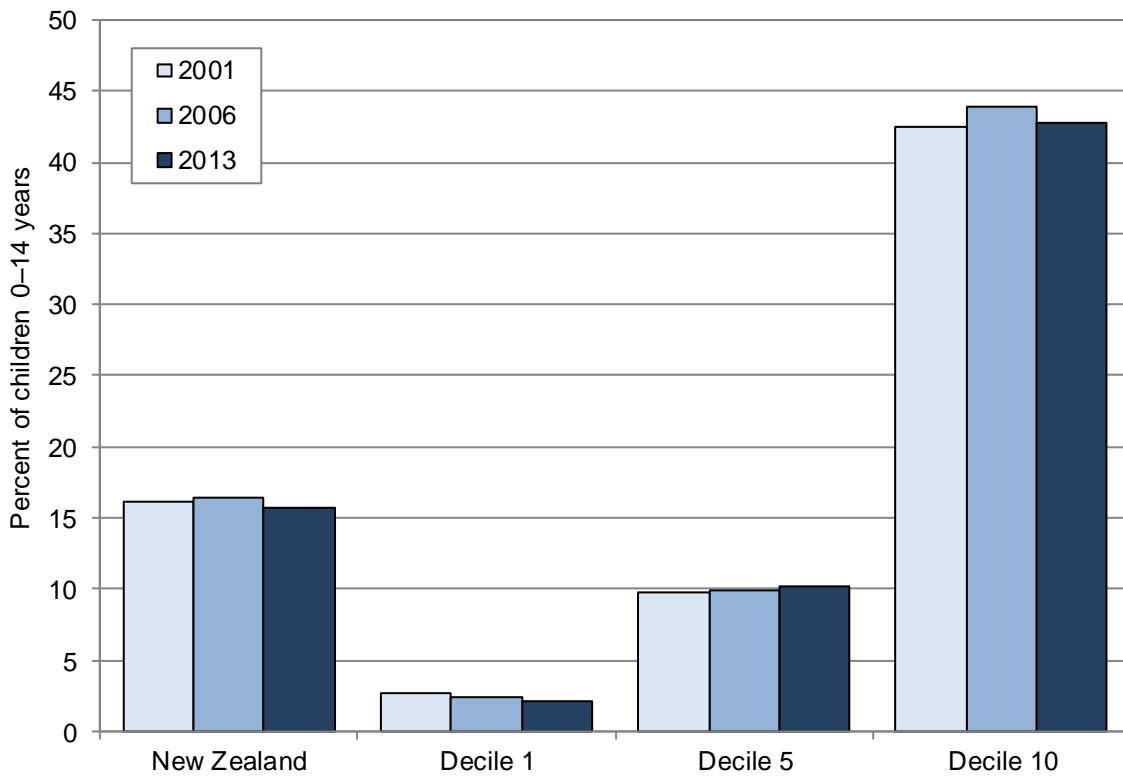
Source: Statistics New Zealand: Measure is the Canadian National Occupancy Standard

Figure 53. Percentage of children aged 0–14 years living in crowded households by ethnicity, New Zealand at the 2001, 2006 and 2013 Censuses



Source: Statistics New Zealand; Note: Ethnicity is level 1 prioritised

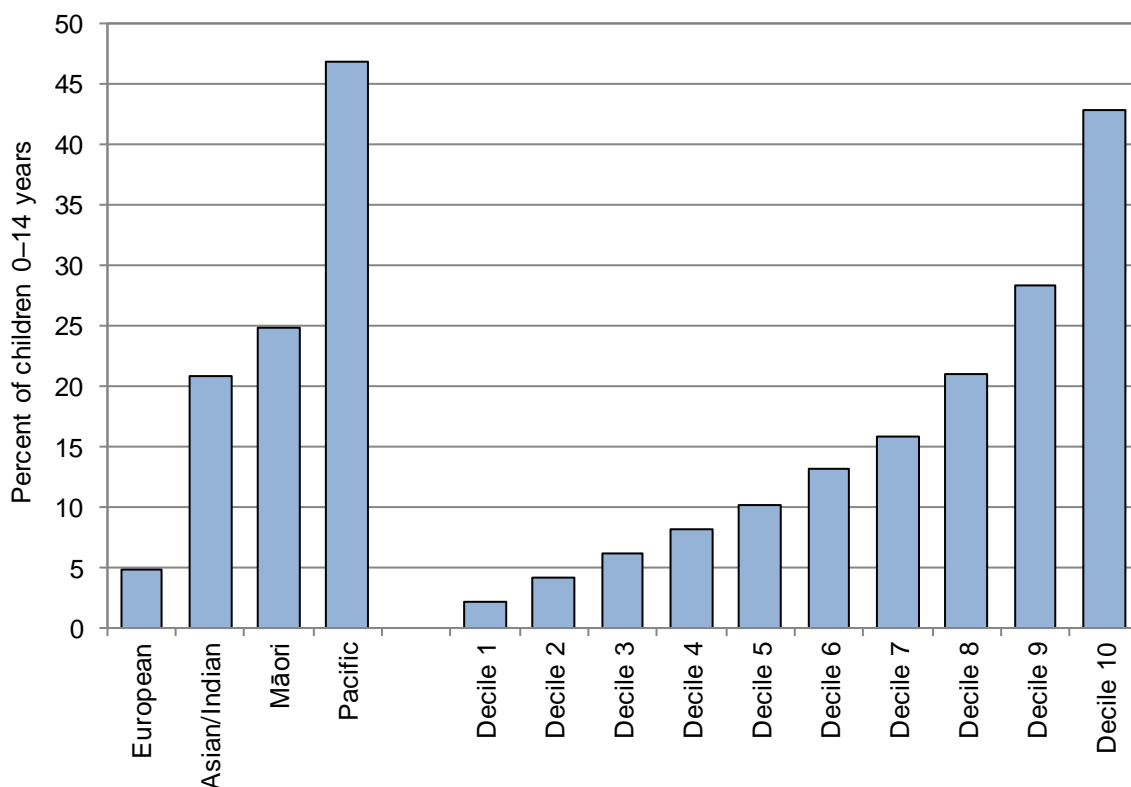
Figure 54. Percentage of children aged 0–14 years living in crowded households by NZ Deprivation Index decile, New Zealand at the 2001, 2006 and 2013 Censuses



Source: Statistics New Zealand; See Note 3 in Methods box for further interpretation.



Figure 55. Percentage of children aged 0–14 years living in crowded households by ethnicity and NZ Deprivation Index decile, New Zealand at the 2013 Census



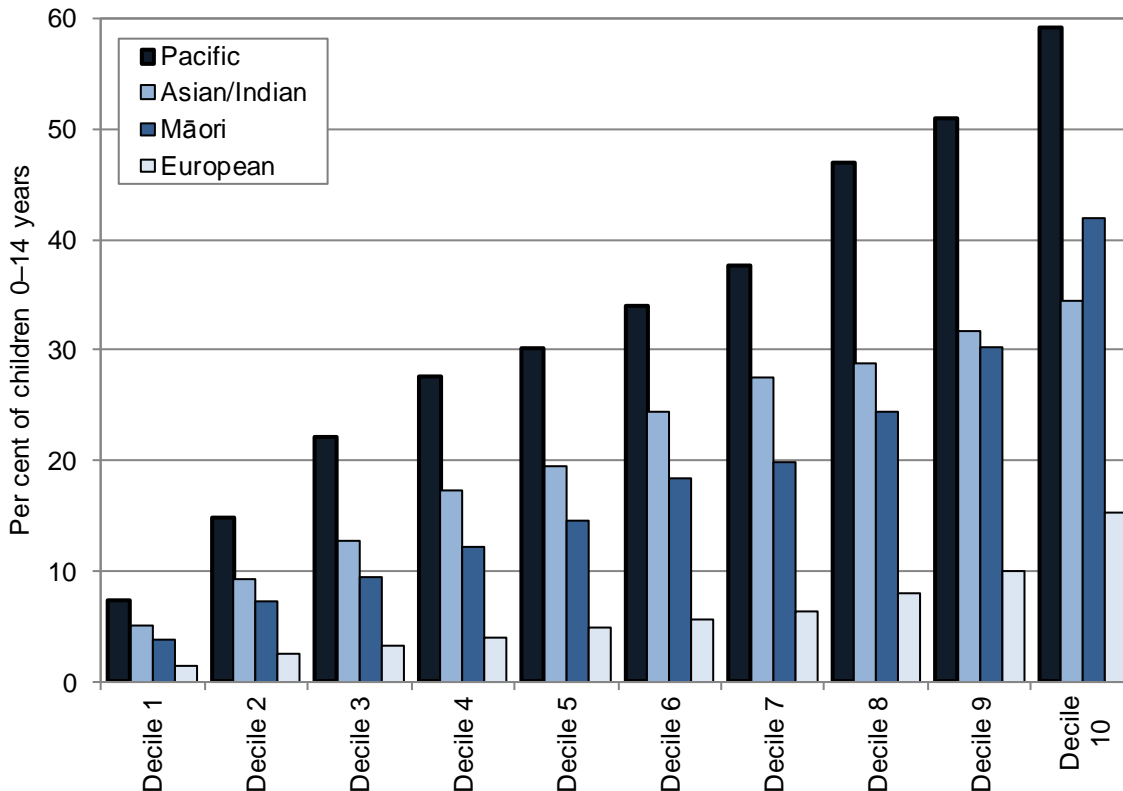
Source: Statistics New Zealand; Note: Ethnicity is level 1 prioritised; Decile is NZDep13; See Note 3 in Methods box for further interpretation.

Table 16. Children aged 0–14 years living in crowded households by ethnicity and NZ Deprivation Index decile, New Zealand at the 2013 Census

	Number of children	Percent of children	Rate ratio	95% CI
Ethnicity				
Māori	47,724	24.8	5.21	5.13–5.29
Pacific	33,576	46.8	9.85	9.70–10.01
European	19,839	4.8	1.00	
Asian/Indian	17,919	20.8	4.37	4.29–4.46
NZ deprivation index decile				
Decile 1	1,806	2.1	1.00	
Decile 2	3,423	4.2	1.97	1.86–2.09
Decile 3	4,734	6.0	2.86	2.71–3.01
Decile 4	6,267	8.2	3.87	3.67–4.07
Decile 5	7,671	10.1	4.80	4.56–5.05
Decile 6	9,744	13.1	6.18	5.89–6.50
Decile 7	11,613	15.8	7.47	7.12–7.85
Decile 8	15,858	21.0	9.94	9.47–10.42
Decile 9	23,373	28.3	13.38	12.77–14.03
Decile 10	42,078	42.8	20.26	19.35–21.22

Source: Statistics New Zealand; Note: Ethnicity is level 1 prioritised; Decile is NZDep13; See Note 3 in Methods box for further interpretation

Figure 56. Percentage of children aged 0–14 years living in crowded households by ethnicity and NZ Deprivation Index decile, New Zealand at the 2013 Census



Source: Statistics New Zealand; Note: Ethnicity is level 1 prioritised; Decile is NZDep13; See Note 3 in Methods box for further interpretation

Distribution by Ethnicity and NZ Deprivation Index Decile

At the 2013 Census, the proportion of children living in crowded households increased with increasing NZDep13 deprivation within each of New Zealand’s largest ethnic groups. At each level of NZDep13 deprivation, the proportion of children living in crowded households was highest for Pacific children, followed by Māori and then European children. Asian/Indian children had higher exposures to household crowding than European children in each NZDep13 Index decile, as well as higher exposures than Māori children in NZDep13 deciles 1–8. In the most deprived areas (NZDep13 decile 10), however, Māori children had higher exposures to household crowding than Asian/Indian children (**Figure 56**).

Distribution by Territorial Local Authority

At the 2013 Census, the proportion of children living in crowded households varied by Territorial Local Authority with the proportion ranging from 4.0% in Selwyn District to 29.1% in Otago District. The largest number of children living in crowded households (n=61,272) resided in the Auckland Region (Table 17, Table 18).



Table 17. North Island children aged 0–14 years living in crowded households by Territorial Local Authority, New Zealand at the 2013 Census

Territorial Local Authority	Number of children	Percent of children	Rate ratio	95% CI	Territorial Local Authority	Number of children	Percent of children	Rate ratio	95% CI
North Island children 0–14 years living in crowded households									
Far North District	2,757	25.1	1.59	1.54–1.64	Hastings District	2,862	18.8	1.19	1.15–1.23
Whangarei District	2,214	14.7	0.93	0.90–0.97	Napier City	1,548	14.4	0.91	0.87–0.95
Kaipara District	474	13.5	0.85	0.78–0.93	Central Hawke's Bay District	225	9.2	0.58	0.52–0.66
Auckland	61,272	22.3	1.42	1.40–1.43	New Plymouth District	1,254	8.8	0.56	0.53–0.59
Thames-Coromandel District	495	12.4	0.79	0.72–0.85	Stratford District	120	6.5	0.42	0.35–0.49
Hauraki District	417	12.7	0.81	0.74–0.88	South Taranaki District	582	10.5	0.67	0.62–0.72
Waikato District	1,989	14.2	0.90	0.87–0.94	Ruapehu District	519	20.8	1.32	1.22–1.42
Matamata-Piako District	786	12.2	0.77	0.72–0.83	Wanganui District	1,071	13.6	0.86	0.81–0.91
Hamilton City	4,599	16.2	1.03	1.00–1.06	Rangitikei District	381	13.8	0.87	0.80–0.96
Waipa District	660	7.1	0.45	0.42–0.48	Manawatu District	420	7.7	0.49	0.45–0.54
Otorohanga District	231	11.6	0.74	0.65–0.83	Palmerston North City	1,668	11.1	0.71	0.68–0.74
South Waikato District	936	19.5	1.24	1.17–1.31	Tararua District	279	8.2	0.52	0.46–0.58
Waitomo District	426	21.7	1.38	1.27–1.50	Horowhenua District	894	16.7	1.06	1.00–1.12
Taupo District	933	14.4	0.91	0.86–0.97	Kapiti Coast District	723	8.5	0.54	0.50–0.58
Western Bay of Plenty District	1,143	14.1	0.89	0.85–0.94	Porirua City	2,511	21.8	1.38	1.33–1.43
Tauranga City	2,460	11.0	0.70	0.67–0.73	Upper Hutt City	786	10.2	0.65	0.61–0.69
Rotorua District	2,493	18.3	1.16	1.12–1.20	Lower Hutt City	3,276	16.8	1.07	1.03–1.10
Whakatane District	1,515	21.8	1.38	1.32–1.45	Wellington City	3,039	9.8	0.62	0.60–0.64
Kawerau District	396	27.4	1.74	1.60–1.89	Masterton District	471	10.9	0.69	0.64–0.75
Opotiki District	486	29.1	1.84	1.71–1.99	Carterton District	105	6.8	0.43	0.36–0.52
Gisborne District	2,301	23.6	1.50	1.44–1.55	South Wairarapa District	114	6.5	0.41	0.35–0.49
Wairoa District	462	26.5	1.68	1.55–1.81	New Zealand	126,603	15.8	1.00	

Source: Statistics New Zealand

Table 18. South Island children aged 0–14 years living in crowded households by Territorial Local Authority, New Zealand at the 2013 Census

Territorial Local Authority	Number of children	Percent of children	Rate ratio	95% CI
South Island children 0–14 years living in crowded households				
Tasman District	597	6.7	0.42	0.39–0.46
Nelson City	750	9.0	0.57	0.53–0.61
Marlborough District	594	8.1	0.52	0.48–0.56
Kaikoura District	54	9.6	0.61	0.47–0.78
Buller District	177	9.9	0.63	0.55–0.72
Grey District	144	6.6	0.42	0.36–0.49
Westland District	102	7.3	0.46	0.38–0.56
Hurunui District	132	6.4	0.40	0.34–0.48
Waimakariri District	666	6.9	0.44	0.41–0.47
Christchurch City	6,240	11.1	0.70	0.69–0.72
Selwyn District	378	4.0	0.25	0.23–0.28
Ashburton District	540	8.9	0.56	0.52–0.61
Timaru District	483	6.4	0.41	0.37–0.44
Mackenzie District	33	4.5	0.28	0.20–0.40
Waimate District	75	6.1	0.38	0.31–0.48
Chatham Islands Territory	9	9.1	0.58	0.31–1.07
Waitaki District	318	8.9	0.57	0.51–0.63
Central Otago District	141	4.8	0.31	0.26–0.36
Queenstown-Lakes District	261	5.4	0.34	0.30–0.38
Dunedin City	1,140	6.3	0.40	0.38–0.42
Clutha District	177	5.4	0.34	0.30–0.40
Gore District	129	5.7	0.36	0.31–0.43
Invercargill City	819	8.5	0.54	0.51–0.58
New Zealand	126,603	15.8	1.00	

Source: Statistics New Zealand



Northern DHBs Distribution and Trends

Northern DHBs Distribution

At the 2013 Census, 18.4% of Northland, 13.7% of Waitemata, 22.3% of Auckland and 30.4% of Counties Manukau children lived in crowded households, with crowding rates in Northland, Auckland and Counties Manukau being *significantly higher* than the New Zealand rate, while rates in the Waitemata DHB were *significantly lower* (Table 19).

Table 19. Number and proportion of children 0–14 years living in crowded households, Northern DHBs vs. New Zealand at the 2013 Census

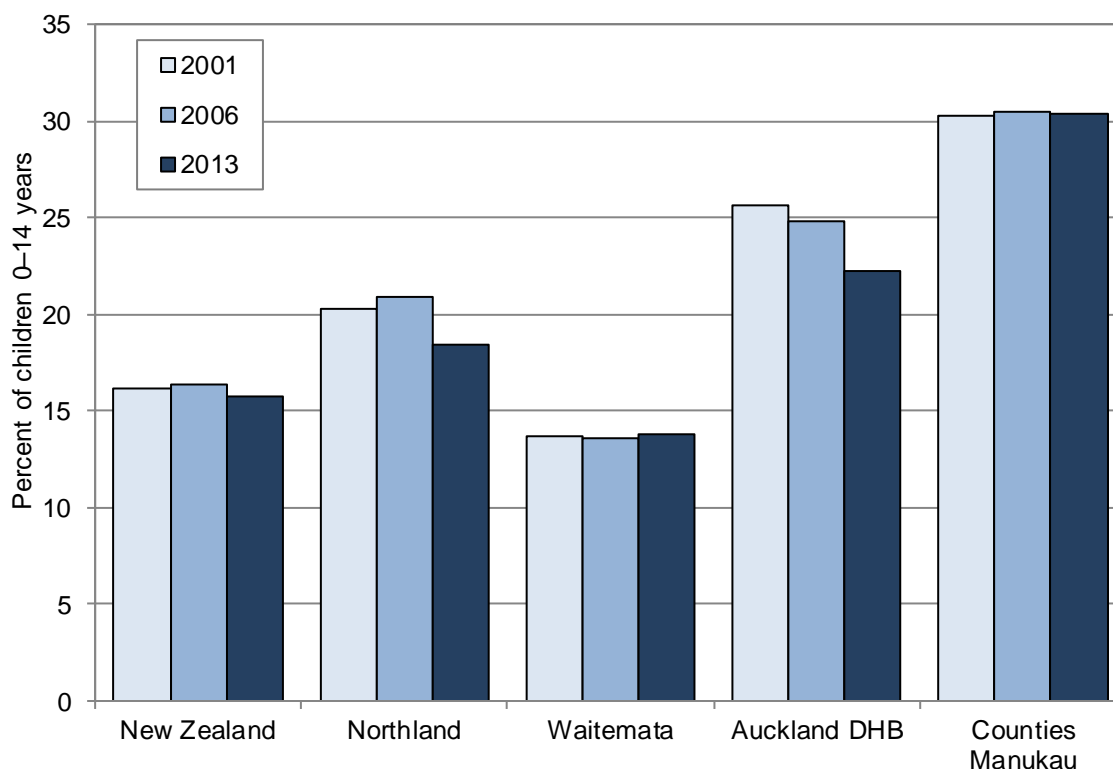
DHB	Number of children	Percent of children	Rate ratio	95% CI
Children 0–14 years living in crowded households				
Northland	5,445	18.4	1.17	1.14–1.20
Waitemata	13,938	13.7	0.87	0.86–0.89
Auckland	16,206	22.3	1.41	1.39–1.43
Counties Manukau	31,563	30.4	1.93	1.91–1.95
New Zealand	126,600	15.8	1.00	

Source: Statistics New Zealand; Note: Ethnicity is Level 1 prioritised; Decile is NZDep13

Northern DHB Trends

In the Waitemata and Counties Manukau DHBs, the proportion of children living in crowded households changed little between Censuses, while in the Northland and Auckland DHBs, crowding rates in 2013 were lower than in 2001 (Figure 57).

Figure 57. Percentage of children aged 0–14 years living in crowded households, Northern DHBs vs. New Zealand at the 2001, 2006, and 2013 Censuses

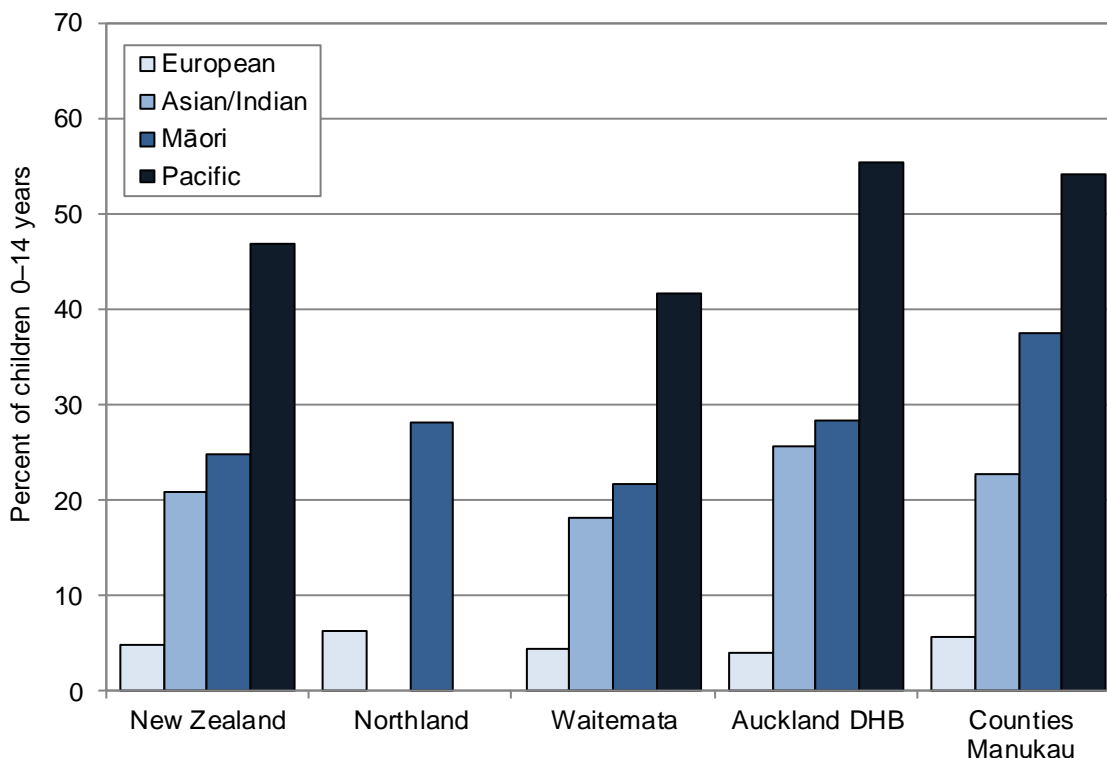


Source: Statistics New Zealand

Distribution by Ethnicity

In the Waitemata, Auckland and Counties Manukau DHBs a higher proportion of Pacific > Māori > Asian/Indian > European children lived in crowded households at the 2013 Census, while in Northland a higher proportion of Māori than European children lived in crowded households (**Figure 58**).

Figure 58. Percentage of children aged 0–14 years living in crowded households by ethnicity, Northern DHBs vs. New Zealand at the 2013 Census



Source: Statistics New Zealand; Note: ethnicity is Level 1 prioritised

Local Policy Documents and Evidence Based Reviews Relevant to household crowding

Table 20 (below) provides an overview of New Zealand policy documents and evidence-based reviews that consider the relationship between household crowding and health. As interventions to provide healthy housing are usually multi-faceted the publications cover issues broader than crowding alone. Two case studies of specific interventions are included.



Table 20. Local policy documents and evidence based reviews relevant to household crowding

Ministry of Social Development documents
<p>Ministry of Social Development. 2014. Annual Report 2013/2014. Wellington: Ministry of Social Development http://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/corporate/annual-report/2014/annual-report-2013-2014.pdf</p> <p>From April 2014 the Ministry of Social Development is responsible for assessing social housing needs, including managing the social housing waitlist. This change to the provision of social housing aims to improve the social housing market and ensure provision to those most in need. The transfer of the housing assessment role from Housing New Zealand provides tenants with a more comprehensive needs assessment including issues such as employment, income or other social services that co-exist with housing needs for more than 80% of state housing tenants.</p>
Evidence-based medicine reviews
<p>Baker M, et al. 2013. Infectious diseases attributable to household crowding in New Zealand: A systematic review and burden of disease estimate. Wellington: He Kainga Oranga/ Housing and Health Research Programme, University of Otago. http://www.healthyhousing.org.nz/wp-content/uploads/2010/01/HH-Crowding-ID-Burden-25-May-2013.pdf</p> <p>This systematic review and meta-analysis investigated the relationship between household crowding and close contact infectious diseases (IDs). There were 345 studies included in a narrative synthesis and 82 of these studies were included in a meta-analysis which found a statistically significant increased risk for 9 out of 10 close contact infectious diseases (IDs) associated with crowded housing. This association persisted when effects of age and socioeconomic status were taken into account. A burden of disease analysis estimated that 1,343 hospitalisations for specified IDs (10% of all hospital admissions for these diseases) can be attributed to household crowding. More than half the included studies focused on children, especially children aged 0–6 years, who are overrepresented in exposure to household crowding and may also be disproportionately affected by such exposure. The authors conclude that crowding reduction interventions, including policies to improve housing affordability, have the potential to improve child health and to significantly reduce hospital admissions for IDs.</p>
<p>Thomson H, et al. 2013. Housing improvements for health and associated socio-economic outcomes. Cochrane database of systematic reviews http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD008657.pub2/pdf</p> <p>This systematic review assessed change in any health outcome following interventions which involved a physical improvement to the fabric of a house. Thirty-nine studies reporting quantitative or qualitative data were included in the narrative synthesis. Studies with a focus on improving warmth for people with chronic respiratory disease were most likely to report health improvement. Improving warmth was also associated with an increase in usable space within the home, which increased privacy and improved social relationships, and was associated with reduced absences from work or school due to illness. The authors conclude that the best available evidence indicates that housing which is an appropriate size for the householders and is affordable to heat is linked to improved health and may promote improved social relationships within and beyond the household.</p>
Other Relevant New Zealand Publications
<p>New Zealand Productivity Commission. 2012. Housing affordability inquiry. Wellington: The New Zealand Productivity Commission. http://www.productivity.govt.nz/sites/default/files/Final%20Housing%20Affordability%20Report_0_0.pdf</p> <p>The Productivity Commission undertook an inquiry into housing affordability in New Zealand. Within a wide-ranging and comprehensive report, the Commission notes that housing stability and continuity are often essential for addressing the needs of families requiring social assistance. Community organisations advised the Commission that higher rental costs in the private rental market had led to a marked increase in overcrowding. The Commission recommended an increased role for the community sector in provision of social housing, with the proviso that there must be support to increase the supply of affordable housing and reduce the risk of inadequate housing alternatives for households in need who are not eligible for state housing. The Commission also noted that the social and cultural resources of whānau and communities are essential to enable Māori to find appropriate housing solutions.</p>
<p>Housing New Zealand Corporation. 2013. Statement of intent 2013–2016. Wellington: New Zealand Government. http://www.hnzc.co.nz/our-publications/statement-of-intent/statement-of-intent-2013-2016/statement-of-intent_2013-16.pdf</p> <p>Housing New Zealand is the Crown agency currently responsible for providing housing to those most in need. Housing New Zealand will trial the Housing Warrant of Fitness system developed by the government on its properties (see http://www.hnzc.co.nz/news/february-2014/housing-new-zealand-is-trialling-a-new-wof-scheme/?searchterm=warrant%20of%20fitness) to ensure minimum standards for dry, safe homes are met. The Housing New Zealand Project 324&5 will deliver up to 3,000 new bedrooms to 2,000 properties over two years from 2013 to improve health and education outcomes for tenants with larger families. Details of the Government's Social Housing Reform Programme are being developed in the 2013/2014 year and may impact on the future budget, operations and performance targets of Housing New Zealand.</p>

McDonald A. 2014. **Linking housing and health in the Hutt Valley: Housing coordinator pilot evaluation.**

Wellington: Regional Public Health.

http://ndhadeliver.natlib.govt.nz/delivery/DeliveryManagerServlet?dps_pid=IE20943570&dps_custom_att_1=ilsdb

This evaluation of the Housing Co-ordinator pilot study (HCP) initiated by a DHB demonstrates a practical approach to improving health outcomes. With their consent, a public health nurse with expertise in housing (the Housing Co-ordinator, HC) visited the homes of selected children and adults admitted to hospital with health conditions that can be linked to cold, damp or crowded housing after they were discharged from hospital. Twenty-eight households were recruited over 16 weeks and 17 visits completed (the HC was unable to contact 7 households after discharge and 4 opted out). The HC provided a housing, health and social assessment with referral to housing, health or social agencies as necessary, for services such as insulation, smoking cessation, budgeting, and income support. Public Health staff, hospital staff and external providers were all supportive of the HCP, and participants who had a co-ordinator visit liked the approach of the programme and appreciated referrals to services. Challenges to be addressed include having broader and simpler criteria for eligibility and better processes to follow-up on service provision following referral.

Pene G, et al. 2009. Pacific families now and in the future: living the Tokelauan way in New Zealand.

<http://www.familiescommission.org.nz/sites/default/files/downloads/living-the-tokelauan-way.pdf>

This report includes a case study that investigated the experiences of a three-generational Tokelauan extended family who were selected to move from a conventional state house to a purpose-built extended-family dwelling. Crowding was a particular problem in the original house, exacerbated by excessive cold which led the family to heat and live in only one room. With more room and greater warmth in the new dwelling the husband of the family was able to return to work after five years of unemployment due to poor health, the children had space to do homework and got better grades at school, and the family were more socially engaged and able to offer hospitality to wider family and friends. The authors conclude that properly designed social housing can improve the health and social wellbeing of family members.

James B & Saville-Smith K. 2010. **Children's Housing Futures.** Wellington: Centre for Housing Research Aotearoa New Zealand. <http://www.chranz.co.nz/pdfs/childrens-housing-futures-report.pdf>

This research report examines the housing futures of New Zealand's children, with a view to improving New Zealand's capacity to address the housing needs of children now and into the future. The report consists of: a description of socio-demographic housing trends; a literature review on key housing issues affecting children, housing solutions workshops with key stakeholders; and identification of key priorities and recommendations. The exposure of children to unaffordable housing, houses in poor condition, crowding and insecure tenure; and the strong trend towards children to be housed in the rental market, are identified as key issues. Five key priorities are recommended: developing housing policy that treats children's housing needs as seriously as adult housing needs; developing policy and cross-sectoral services that integrate housing aware child services with child-centred housing delivery, including a standardised housing needs assessment tool; improving the quality and security of the rental market; transforming the housing stock by actively pursuing child wellbeing outcomes, for example retrofitting insulation; diversifying tenure shared ownership and non-speculative housing and housing provision and recruiting a range of different providers into the housing market. Several research priorities are identified.

Other relevant publications

Ormandy D. 2014. **Housing and child health.** Paediatrics and Child Health (United Kingdom), 24(3), 115–17.

Ormandy reviews and summarises the serious threats to children's health associated with unhealthy housing conditions. Crowded housing and frequent moves from one dwelling to another have a negative impact on children's mental and physical health including risk of physical injury, and likelihood of school underachievement. Ormandy sees the protection of families with young children from being forced to live in crowded conditions or to move frequently as a priority for policy. The introduction of the Housing Health and Safety Rating System (HHSRS) in England and Wales provides new possibilities for closer co-operation between housing and health sectors within local authorities to remove or reduce hazards to health in the home environment. Children are particularly vulnerable to hazards such as excess cold, damp and mould growth, and fall hazards.

Website

He Kainga Oranga is the Housing and Health research programme based at the University of Otago, Wellington and is a comprehensive repository for New Zealand research about the associations between housing and health <http://www.healthyhousing.org.nz/>

Note: The publications listed above were identified using the search methodology outlines in **Appendix 1**

EDUCATION: KNOWLEDGE AND SKILLS



EARLY CHILDHOOD EDUCATION

Introduction

Early childhood development significantly influences subsequent life chances and health, and investing in the early years is one of the most effective ways to reduce health inequities due to the social determinants of health [24]. Children who do not develop necessary non-cognitive skills such as self-control early in life are at greater risk of later school and social failure particularly in adolescence [58].

Targeted investment in evidence-based education, prevention and treatment programmes directed towards at-risk children and their families has a high rate of social and economic return. Programmes that address the needs of parents and children at the same time appear to be particularly effective [58]. Health benefits of Early Childhood Education (ECE) for disadvantaged children persist into adulthood with lower prevalence of risk factors for cardiovascular and metabolic diseases [59] [60].

In New Zealand, ECE is provided by parent-led and teacher-led services including Nga Kohanga Reo, Playcentres, Playgroups, Kindergartens and centre- or home-based Education and Care services. Regional Health Schools provide teachers to children in hospital, or who are at home and unable to attend ECE because of illness [61]. Participation rates in early childhood education (ECE) need to improve further to be on track towards the Government target of 98% of children starting school with prior participation in quality early childhood education by 2016 [62].

The following section uses Ministry of Education data to review enrolments in early childhood education (ECE), as well as the proportion of new entrants who had participated in ECE prior to school entry.

Data Source and Methods

Indicators

1. Number of enrolments in licensed early childhood education services

Numerator: Total number of enrolments in licensed early childhood education services

Denominator: Not applicable (see notes below)

2. Average weekly hours attended by children at licensed early childhood education services

The average weekly hours of attendance of regular enrolments in ECE by service type

3. Proportion of new entrants who had previously attended early childhood education

Numerator: The number of new entrants reporting participation in ECE prior to attending school

Denominator: The number of new entrants enrolled

Data Source

Ministry of Education <http://www.educationcounts.govt.nz/>

Notes on Interpretation:

Note 1: Enrolment numbers overestimate participation in ECE because of double or triple counting of those children who attend more than one ECE service. This is particularly problematic for three and four year-olds, as they have fairly high rates of participation. To get a more accurate picture of the proportion of children participating in ECE, prior participation in ECE is a better indicator. Enrolment numbers however are a useful indicator of patterns of enrolment across different service types. For a description of ECE service types see <http://www.educationcounts.govt.nz/statistics/ece>

Note 2: The number of new school entrants reporting participation in ECE prior to attending school is a useful measure of ECE participation as it overcomes some of the double counting problems associated with ECE enrolment measures. However no information is provided on the duration of, number of hours in, or the type of ECE attended prior to attending school.

School Socioeconomic Decile: All schools are assigned a decile ranking based on the socioeconomic status of the areas they serve. These rankings are based on Census data from families with school age children in the areas from which the school draws its students. Census variables used in the ranking procedure include equivalent household income, parent's occupation and educational qualifications, household crowding and income support payments. Using these variables, schools are assigned a decile ranking, with decile 1 schools being the 10% of schools with the highest proportion of students from low socioeconomic communities and decile 10 schools being the 10% of schools with the lowest proportion of these students. Decile ratings are used by the Ministry of Education to allocate targeted funding, as well as for analytical purposes.



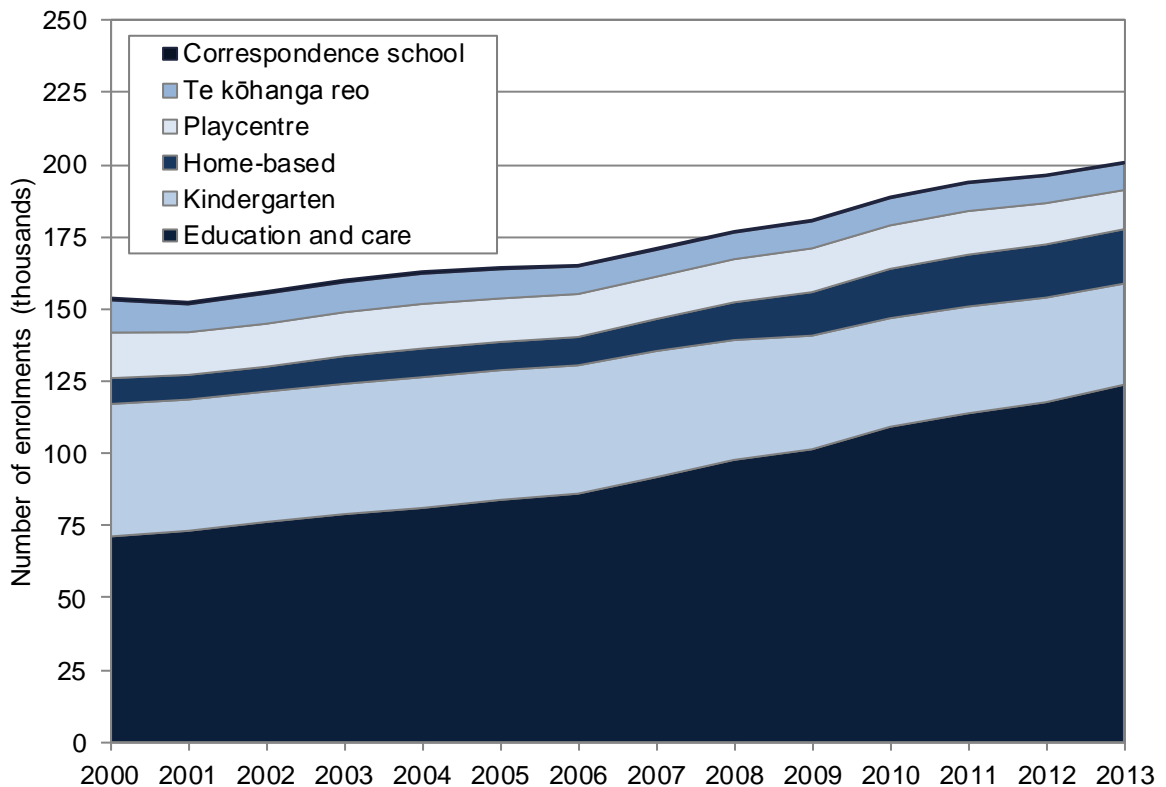
Enrolments in Early Childhood Education

New Zealand Distribution and Trends

Trends by Service Type

In New Zealand from 2000 to 2013, the number of enrolments in early childhood education increased by 30.5%. Changes varied markedly by service type, however, with enrolments in Education and Care increasing by 73.8% and enrolments in Home Based Networks increasing by 110.6%. In contrast, enrolments in Te Kōhanga Reo decreased by 17.6%, enrolments in Kindergarten decreased by 23.7%, and enrolments in Playcentre decreased by 14.2% (**Figure 59**).

Figure 59. Number of enrolments in licensed Early Childhood Education services by service type, New Zealand year ended June 2000–2013



Source: Ministry of Education

Hours Spent in Early Childhood Education

In addition to an increase in ECE enrolments, the average number of hours spent in ECE increased for all service types during 2000–2013, with the exception of Playcentres. The average number of hours spent increased from 16.3 hours in 2000 to 24.7 hours in 2013 for Education and Care facilities, from 11.3 hours to 16.7 hours for Kindergartens, and from 16.8 hours to 22.9 hours for home-based care (**Table 21**).

Table 21. Average weekly hours attended by children at licensed Early Childhood Education services by service type, New Zealand July 2000–2013

Year	Education and Care	Kindergarten	Home-based	Playcentre
2000	16.3	11.3	16.8	5.0
2001	17.2	11.6	18.5	4.8
2002	18.5	11.9	18.1	4.9
2003	18.7	12.1	19.9	4.9
2004	19.6	12.6	21.4	4.9
2005	20.4	12.6	22.5	4.9
2006	20.9	12.6	22.1	4.9
2007	21.6	12.7	22.6	4.8
2008	23.0	13.5	22.9	4.8
2009	23.6	14.2	21.6	4.7
2010	23.8	15.2	21.9	4.6
2011	24.0	15.6	22.0	4.6
2012	24.4	16.0	22.3	4.6
2013	24.7	16.7	22.9	4.6

Source: Ministry of Education

Prior Participation in Early Childhood Education

New Zealand Distribution and Trends

Distribution by Ethnicity

In New Zealand, the proportion of new entrants reporting participation in ECE prior to school entry increased, from 90.3% in 2001 to 95.6% in 2013. While prior participation in ECE remained higher for European > Asian > Māori > Pacific children, prior participation increased for all ethnic groups during 2001–2013 (European children 94.9% to 98.2%; Asian children 89.8% to 97.0%; Māori children 83.6% to 92.3%; and Pacific children 76.0% to 88.6%; **Figure 60**).

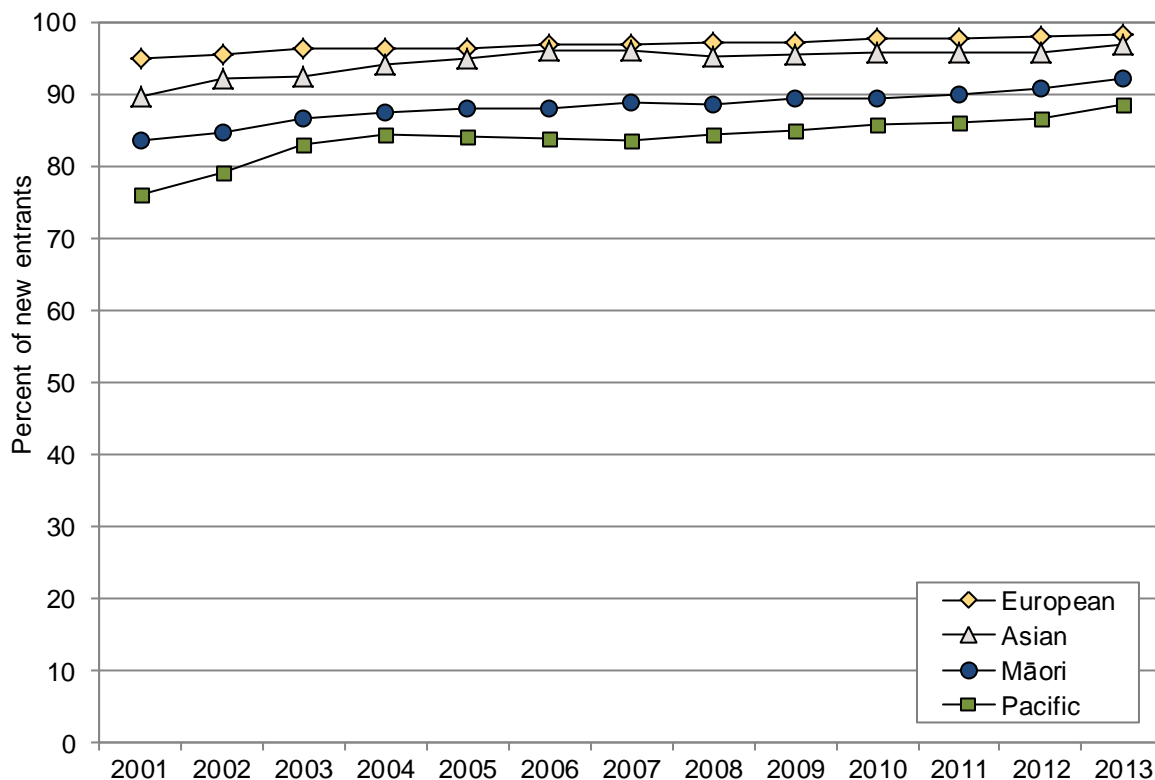
Distribution by School Socioeconomic Decile

In New Zealand during 2013, 14.8% of children attending schools in the most deprived areas (decile 1) had not attended ECE prior to school entry, as compared to only 1.0% of children attending schools in the least deprived areas (decile 10). Nevertheless these figures suggest that on average, 85.2% of children attending schools in the most deprived areas had attended some form of ECE prior to school entry (**Figure 61**).

The proportion of new entrants from the most deprived areas that had participated in ECE prior to school entry increased, from 82.0% in 2011 to 85.2% in 2013, while the proportion has remained fairly consistent for those from the least deprived areas (**Figure 62**).

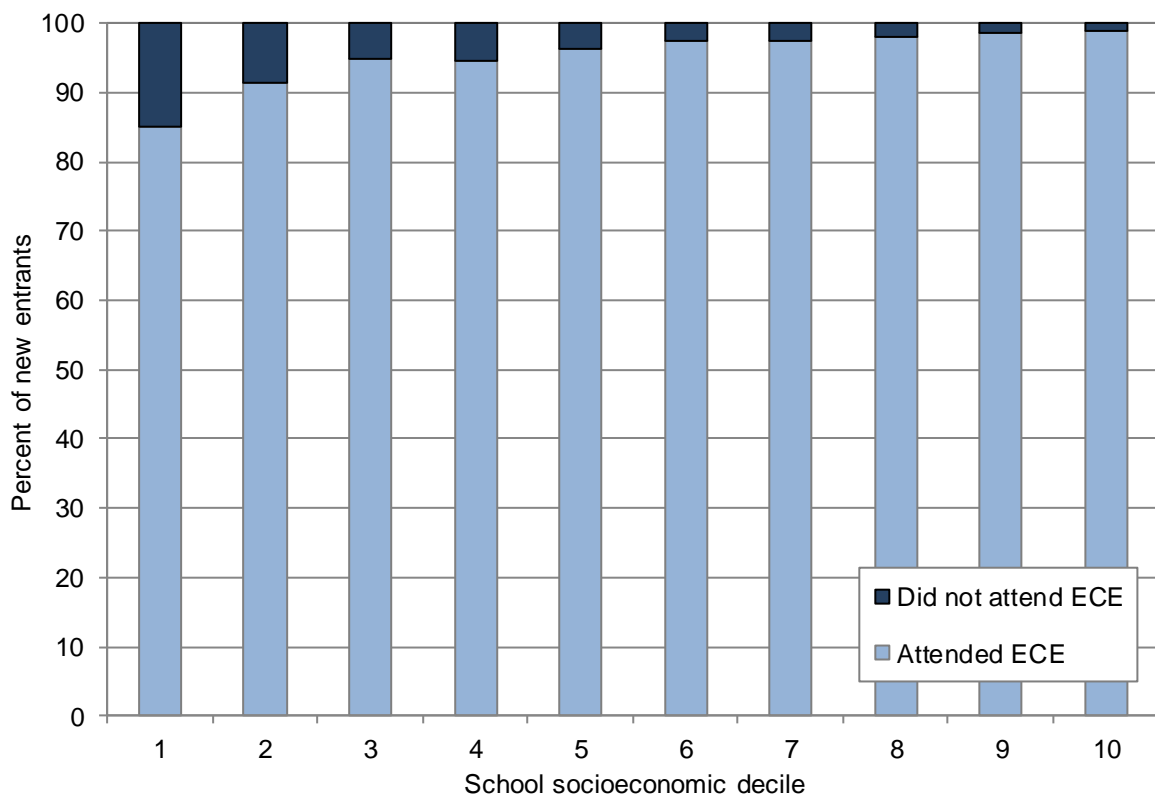


Figure 60. Percentage of new entrants who had previously attended Early Childhood Education by ethnicity, New Zealand 2001–2013



Source: Ministry of Education; Note: Ethnicity is total response and thus individual children may appear in more than one ethnic group

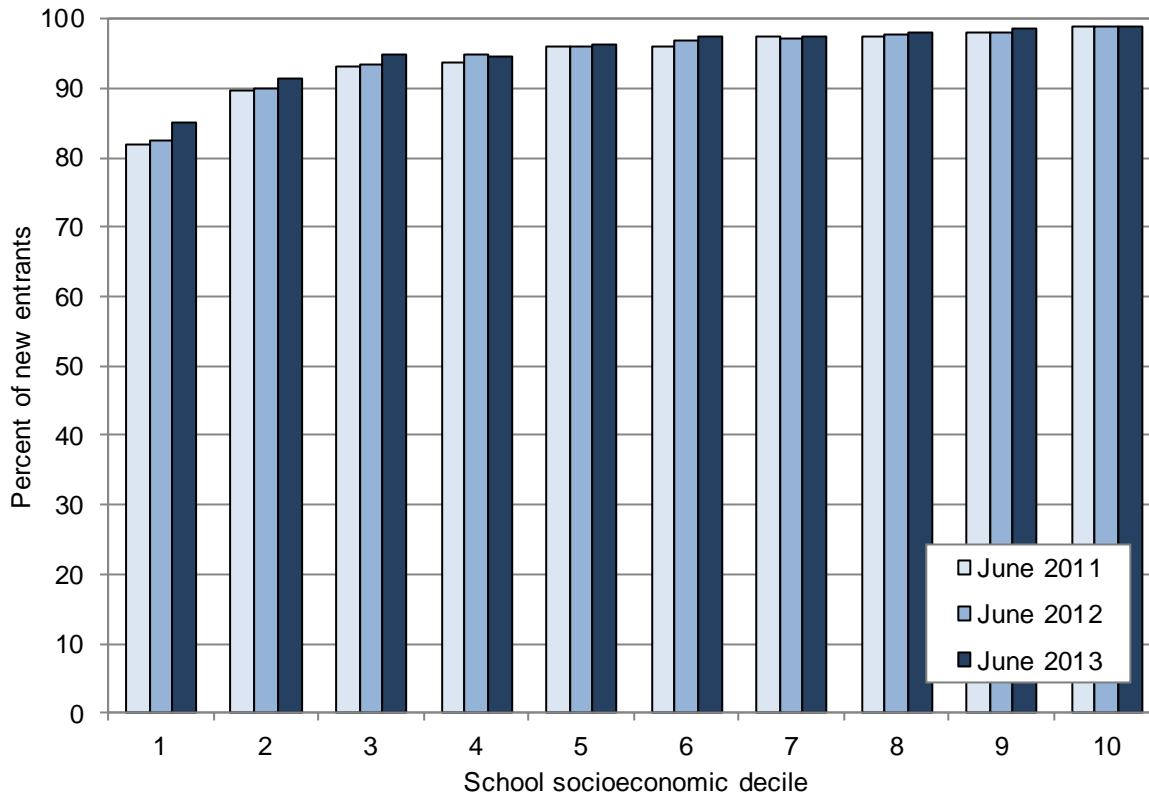
Figure 61. Proportion of new entrants who had previously attended or not attended Early Childhood Education by school socioeconomic decile, New Zealand June 2013



Source: Ministry of Education; Note: Decile 1 = most deprived; Decile 10 = least deprived



Figure 62. Percentage of new entrants who had previously attended Early Childhood Education by school socioeconomic decile, New Zealand year ended June 2011–2013



Source: Ministry of Education; Note: Decile 1 = most deprived; Decile 10 = least deprived

Northern DHBs Distribution and Trends

Northern DHB Trends

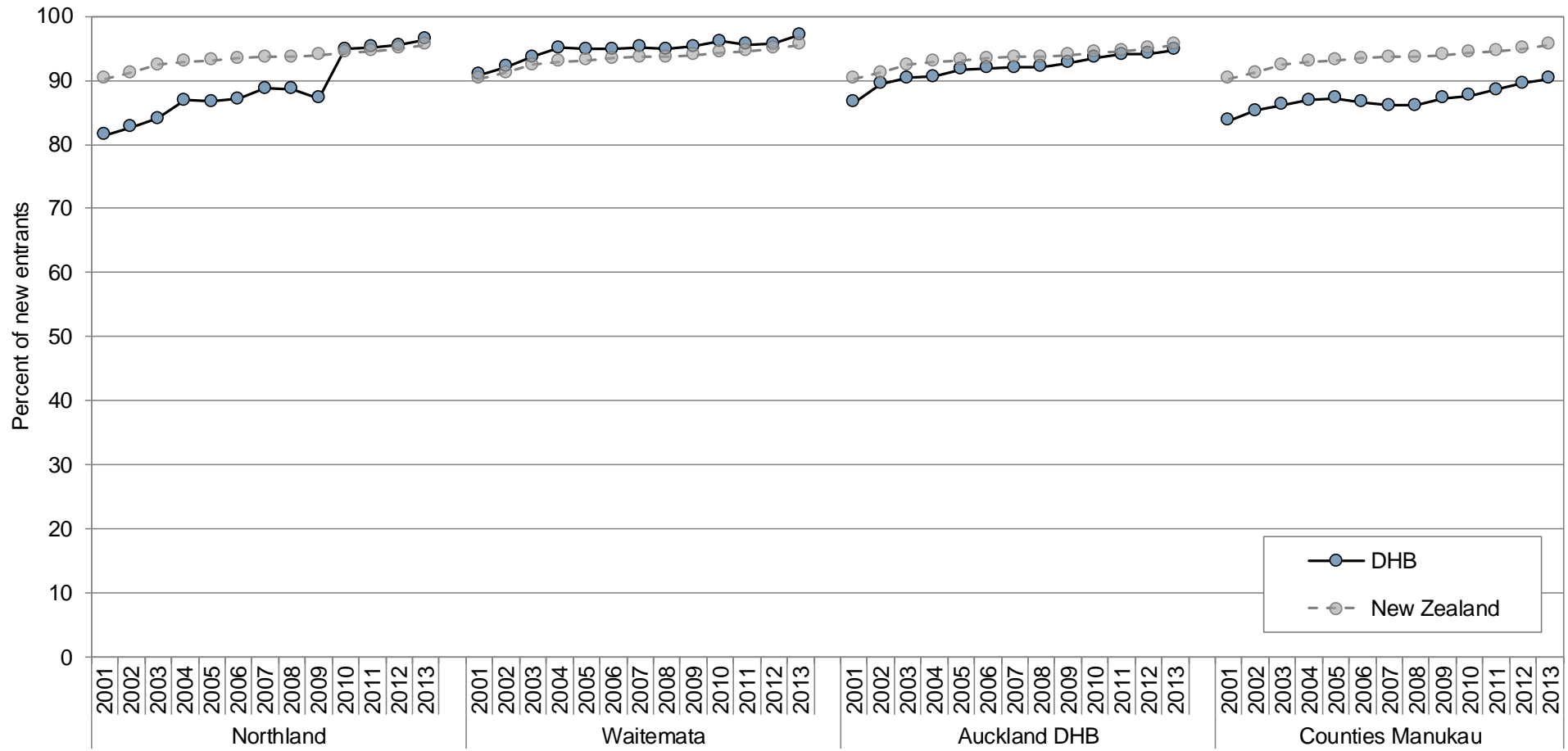
During 2001–2013, prior participation in ECE amongst school entrants increased in all four Northern DHBs, although rates in Counties Manukau were lower than the New Zealand rate throughout this period. While rates in the Auckland and Waitemata DHBs were similar to the New Zealand rate, rates in Northland, while initially lower, became similar to the New Zealand rate from 2010 onwards (**Figure 63**).

Distribution by Ethnicity

In the Waitemata and Auckland DHBs during 2001–2013, prior participation in ECE amongst school entrants was higher for European > Asian > Māori > Pacific children, while in Counties Manukau rates were higher for European and Asian > Māori and Pacific children. In Northland, prior participation was higher for European than for Māori children, although rates increased for all ethnic groups in all DHBs during this period (**Figure 64**).

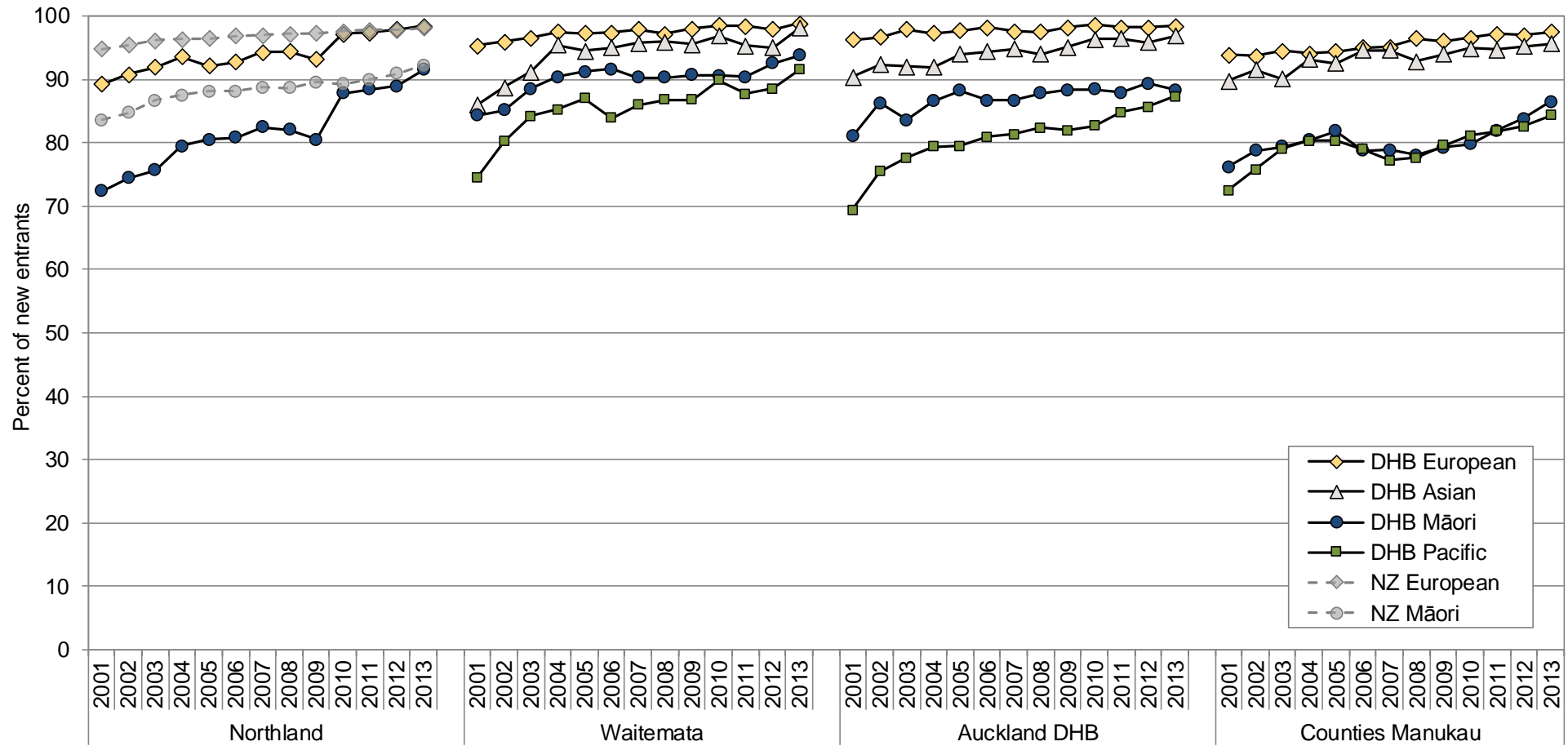


Figure 63. Percentage of new entrants who had previously attended Early Childhood Education, Northern DHBs vs. New Zealand 2001–2013



Source: Ministry of Education

Figure 64. Percentage of new entrants who had previously attended Early Childhood Education by ethnicity, Northern DHBs vs. New Zealand 2001–2013



Source: Ministry of Education; Note: Ethnicity is total response and thus individual children may appear in more than one ethnic group

Local Policy Documents and Evidence-based Reviews Relevant to Early Childhood Education

Table 22 (below) provides a brief overview of local policy documents and evidence-based reviews which are relevant to Early Childhood Education.

Table 22. Local policy documents and evidence-based reviews relevant to Early Childhood Education

Ministry of Education publications
<p style="text-align: center;">Ministry of Education. 2014. Ministry of Education Statement of Intent 2014—2018. http://www.minedu.govt.nz/~media/MinEdu/Files/TheMinistry/2014SOI.pdf</p> <p>The vision of the Ministry of Education (the Ministry) is that all children succeed personally and achieve educational success, recognising that success in education is associated with better health, well-being and higher standards of living. In the early childhood sector the Ministry provides policy advice, licensing of services and funding. Over \$1.5 billion is spent on ECE with over 200,000 children enrolled in over 5,000 services and taught by over 22,000 ECE teachers. The Ministry's strategic direction includes working intensively with iwi and communities to increase participation in quality ECE as part of addressing disparity in achievement, which disproportionately affects Māori and Pasifika children, children from low socio-economic backgrounds, and children with special educational needs. The Ministry restates the Government's goal for 98% of children starting school to have participated in quality early childhood education in 2016.</p>
<p style="text-align: center;">Ministry of Education. Te Whariki He Whariki Matauranga mo nga Mokopuna o Aotearoa: Early Childhood Curriculum. http://www.educate.ece.govt.nz/~media/Educate/Files/Reference%20Downloads/whariki.pdf</p> <p>The early childhood curriculum is designed specifically for children from birth to school entry and defines how providers of ECE can work towards the vision for children in Aotearoa New Zealand to develop as competent and confident learners and communicators who are healthy in mind body and spirit. One of the essential areas of learning and development is well-being: that the health and well-being of the child are protected and nurtured in an environment that promotes health, nurtures emotional well-being and keeps children safe from harm. This includes health promotion and protection activities such as healthy nutrition and exercise, sun protection and reducing transmission of communicable disease.</p>
<p style="text-align: center;">Mitchell L, et al. 2014. ECE Participation Programme Evaluation: Delivery of ECE Participation Initiatives: Stage 2 http://www.educationcounts.govt.nz/_data/assets/pdf_file/0006/148524/ECE-Participation-Programme-Evaluation-Delivery-of-ECE-Participation-Initiatives-Stage-2.pdf</p> <p>The Ministry of Education Participation Programme comprises six initiatives to increase ECE participation in communities where a high proportion of children starting school had no prior experience of ECE, with a focus on "priority children" (i.e. non-participating Māori and Pasifika children and children from communities with low socioeconomic status). This evaluation used mixed methods including enrolment data analysis, parent questionnaires, focus groups with community representatives and interviews with parents. The evaluation found some areas for improvement in each initiative. However each initiative was successful in increasing ECE participation by priority children. Barriers to ECE were overcome and parents said the services provided met families' needs. Community engagement and knowledge was a key factor in the success of initiatives and enabled a brokering role in respect to health, housing, and other social services. Although in early stages, the evaluation demonstrates that there are effective ways to increase participation in ECE and improve prior enrolment figures.</p>
Ministry of Social Development documents
<p style="text-align: center;">Fergusson D, et al. 2012. Early start evaluation report: Nine year follow-up. http://www.msdc.govt.nz/documents/about-msd-and-our-work/publications-resources/evaluation/early-start-evaluation-report-nine-year-follow-up.pdf</p> <p>Early Start is an intensive home-based family support system to meet the needs of high-risk families and their children developed in Christchurch since 1995 by a group of health and social service providers. A randomised controlled trial study provides robust evidence of the outcomes for 220 Early Start (ES) families who received the intervention compared with 223 control group (CG) families who received existing child health and related services only. Trained family support workers visited ES families and had flexibility to provide services to meet each family's particular circumstances. They encouraged positive family change in relation to child health, maternal well-being, parenting skills, household financial management, and managing family crises. At 36 months of age ES children showed greater participation in ECE. Other benefits observed at 36 months were still evident at 9 years, when there was evidence that ES children had significantly lower rates of hospitalisation for injury and poisoning (28% for ES vs. 42% for CG), lower rates of parental reported child abuse (9.8% vs. 21.8%), lower rates of parental reported child behaviour problems and experience of more positive and less punitive parenting. The authors consider that having a sound research base, use of professionally trained staff and clear standards and service manuals contributed to the success of the programme.</p>

International guidelines

National Institute for Health and Clinical Excellence. 2012. **Social and emotional wellbeing: Early years**. NICE public health guidance 40 <http://www.nice.org.uk/guidance/ph40>

This guidance is provided for education, health and community agencies and practitioners with responsibility for vulnerable children aged under 5 years, and aims to define how the social and emotional wellbeing of these children can be supported through home visiting, childcare and early education. The NICE recommends that agencies adopt a 'life course perspective', recognising that disadvantage before birth and in a child's early years can have life-long, negative effects on their health and wellbeing, and notes that social and emotional well-being is the foundation for healthy development as well as mitigating risks associated with disadvantage. Recommendations specific to education include ensuring that eligible children are able to take up their entitlements to ECE, facilitating full involvement of parents and caregivers, and providing appropriate indoor and outdoor environments.

Evidence-based medicine reviews

Zoritch B, et al. 2009. **Day care for pre-school children**. Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD000564 <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000564/abstract>

Eight trials of interventions in which non-parental day care was provided for those <5 years were included in this systematic review of day care for pre-school children. Positive effects were noted, including increases in IQ, benefits to behavioural development and school achievement. Longer term effects were noted in lower teenage pregnancy rates, higher socioeconomic status and decreased criminal behaviour. Mothers' education, employment and interaction with children also benefited. All studies were conducted in the US among disadvantaged populations, limiting their generalisability.

Other relevant publications

Education Review Office. 2013. **Use of Equity Funding in Early Childhood Services**.

<http://www.ero.govt.nz/index.php/National-Reports/Use-of-Equity-Funding-in-Early-Childhood-Services-October-2013>

Equity finding is a funding scheme for eligible ECE services to support, enrol and retain vulnerable children in quality ECE and support their successful transition to school. The Education Review Office (ERO) included specific enquiry about the use of and reporting on allocated equity funding in the regular review process of 147 ECE services. The ERO found that 61% of the services made effective or very effective use of the equity funding through actions such as making ECE affordable, supporting and including children with special needs, engaging parents and whānau as partners in learning and supporting professional learning and development of teachers. Around a third of services had little or no awareness that they received equity funding, and could not account for how it was being used. Challenges to the effective use of funding to reduce disparities include identifying ways to increase involvement of children not already enrolled, rather than only improving participation of those already engaged; working with other agencies to meet the varied needs of children and families, and supporting services to raise the level of educational achievement for vulnerable children. A companion report considers the use of equity funding in Pacific ECE services showed that 11 of 15 services reviewed were using equity funding effectively. <http://www.ero.govt.nz/index.php/National-Reports/Use-of-Equity-Funding-in-Pacific-Early-Childhood-Services-October-2013>

Office of the Children's Commissioner. 2012. **Who gets to play? Promoting participation In ECE for all children**.

Children Winter 2012 No 81. Wellington: Office of the Children's Commissioner.

http://www.occ.org.nz/data/assets/pdf_file/0019/9910/Children_81_web.pdf

"Who gets to play" is a series of articles by a number of New Zealand early childhood education specialists and researchers who examine the evidence and explore the implementation and implications of decisions, policy and practice in the New Zealand early childhood education setting. The report looks at how the right of the child to high quality care is conceptualised and put into practice. A relationship between quality of early childhood education and child development is consistently found, with high quality services resulting in positive outcomes and poor quality services having a long-lasting negative impact. Issues such as universality and the impact of delivering high quality services to all are examined, particularly with respect to the future of a thriving society.

Conti G & Heckman JJ. 2013. **The Developmental Approach to Child and Adult Health**. Pediatrics

doi:10.1542/peds.2013-0252d http://pediatrics.aappublications.org/content/131/Supplement_2/S133.full.pdf+html

This review article brings together information from several studies to look at the long-term effects of childhood education and environment. Long-term follow-up of two early childhood interventions (High/Scope Perry Preschool Project (PPP) and Carolina Abecedarian Project (ABC)) considered health specific outcomes through to adulthood. Compared with a control group who received usual services only, participants in both the PPP and ABC programmes showed consistently better outcomes in levels of education achieved, income, welfare dependence and criminal activity. The authors calculated that early life factors including education and family environment account for at least half the disparity in adult prevalence of poor health, depression and obesity. Analysis of a UK study of a 1958 birth cohort suggested that attributes developed in early childhood can affect the next generation directly, and also through effects on the health behaviour of the pregnant woman.

Note: the publications listed were identified using the search methodology outlined in **Appendix 1**

MĀORI MEDIUM EDUCATION

Introduction

Māori language, custom, land, marae, whānau and community networks all contribute to a secure cultural identity, which is positively linked to health status, educational achievement and emotional and social adjustment [63]. Te Reo Māori (the Māori language) is an official language of New Zealand and the Ministry of Education has a lead role with other government agencies to work with Māori towards achieving the goal of all Māori and other New Zealanders having access to high quality Māori language education [64].

Māori-medium education provides an alternative learning pathway for students to learn through Te Reo Māori from early childhood education and into tertiary education. The sector has its origins in the Kōhanga Reo movement in the early 1980s, driven initially by Māori who saw the need to address the failure of the education system to be responsive to Māori learners. Such education enables learning experiences that reflect Māori knowledge, language and cultural values and is delivered in New Zealand through bilingual (English/Te Reo Māori) classes, Te Reo Māori immersion classes, Ngā Kōhanga Reo early childhood education services, and Kura Kaupapa Māori schools. The three levels of Kura Kaupapa Māori schools within the New Zealand education system are Kura Tuatahi (deliver education from Years 1 to 8 as contributing primary, full-primary or intermediate schools); Kura Arongatahi (deliver education from Year 1 to 13 (as composite schools); and Wharekura (deliver education to Years 9 to 13) [64]. Māori students participating in Māori-medium secondary education were more likely to succeed educationally than their Māori peers at English-medium schools [65].

The National Curriculum for New Zealand is composed of The New Zealand Curriculum and Te Marautanga o Aotearoa [66]. From 2011 Māori-medium kura and settings have been required to implement Te Marautanga o Aotearoa (TMOA) and use the associated assessment tool Ngā Whanaketanga Rumaki Māori [67]. Personal health and development are key components of TMOA and the curriculum seeks to develop successful learners, healthy of mind, body and soul and secure in their identity and sense of belonging [68].

The following section uses Ministry of Education data to review the number of students enrolled in Māori Medium Education.

Data Source and Methods

Indicators

1. Number of enrolments in Māori Medium Early Childhood Education
2. Number of Kura Kaupapa Māori and Kura Teina
3. Number of enrolments in Māori Medium Education
4. Number of students enrolled in Kura Kaupapa Māori and Kura Teina

Data Source

Ministry of Education <http://www.educationcounts.govt.nz/>

Notes on Interpretation

Note 1: Kura kaupapa Māori are schools where the teaching is in the Māori language and the school's aims, purposes and objectives reflect Te Aho Matua philosophy. Kura teina were initiatives by communities wishing to develop a kura kaupapa Māori and had prepared a business case and been formally accepted by the Ministry of Education into the establishment process. During the establishment process, kura teina were attached to and mentored by an established high performing kura kaupapa Māori [69]. Prior to 2001, kura teina were not counted as separate schools, and after 2010 they ceased to exist.

Note 2: Māori medium education includes students who are taught 12% or more of the curriculum in Māori.



New Zealand Distribution and Trends

Enrolments in Māori Medium Early Childhood Education

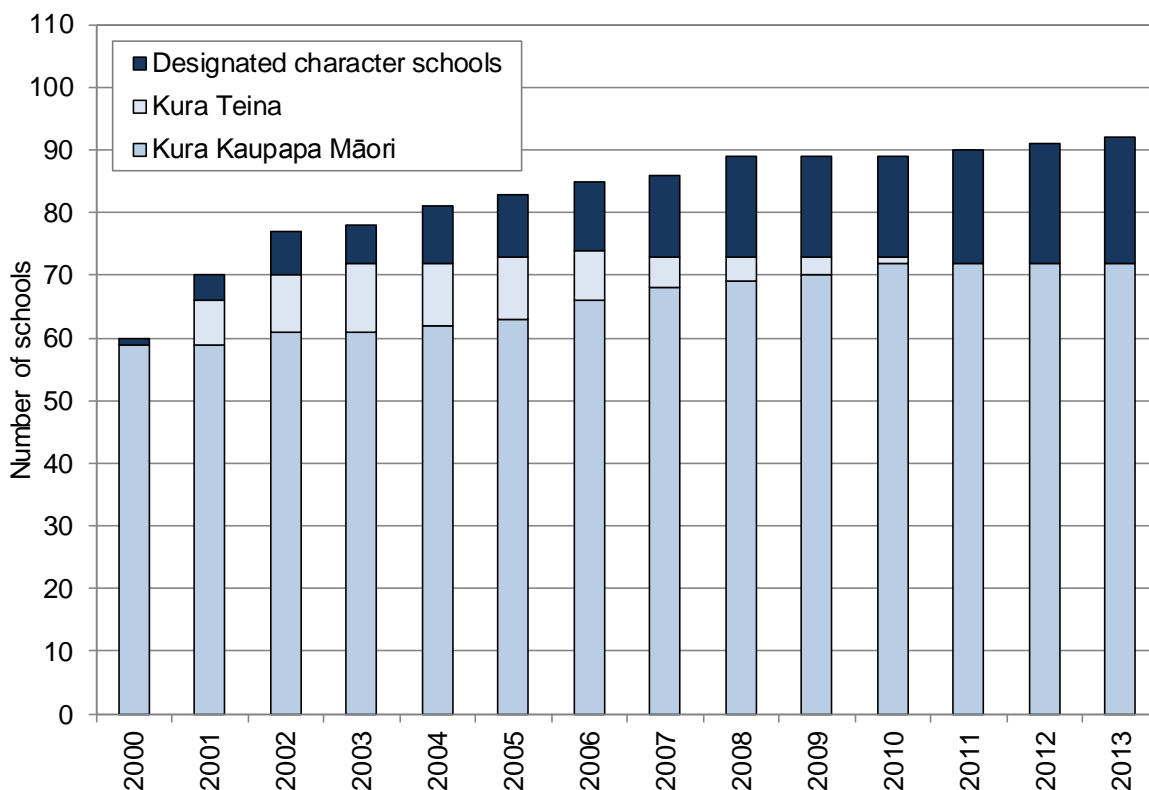
In New Zealand during 2002–2013, the number of enrolments in licensed Te Kōhanga Reo decreased slightly, from 10,389 in 2002 to 9,179 in 2013. A number of children also attended Ngā Puna Kōhungahunga and licence-exempt Te Kōhanga Reo during this period (Table 23).

Table 23. Enrolments in Māori medium early childhood education by type, New Zealand 2002–2013

Year	Licensed Te Kōhanga Reo	Ngā Puna Kōhungahunga	Licence-exempt Te Kōhanga Reo
2002	10,389	351	138
2003	10,319	408	130
2004	10,418	580	191
2005	10,070	519	146
2006	9,493	289	89
2007	9,236	343	69
2008	9,165	454	43
2009	9,288	277	0
2010	9,370	283	0
2011	9,631	278	0
2012	9,366	271	0
2013	9,179	227	0

Source: Ministry of Education

Figure 65. Number of Kura Kaupapa Māori and Kura Teina, New Zealand 2000–2013



Source: Ministry of Education; Note: Prior to 2001 Kura Teina were not counted as separate schools; Kura Teina no longer existed after 2010



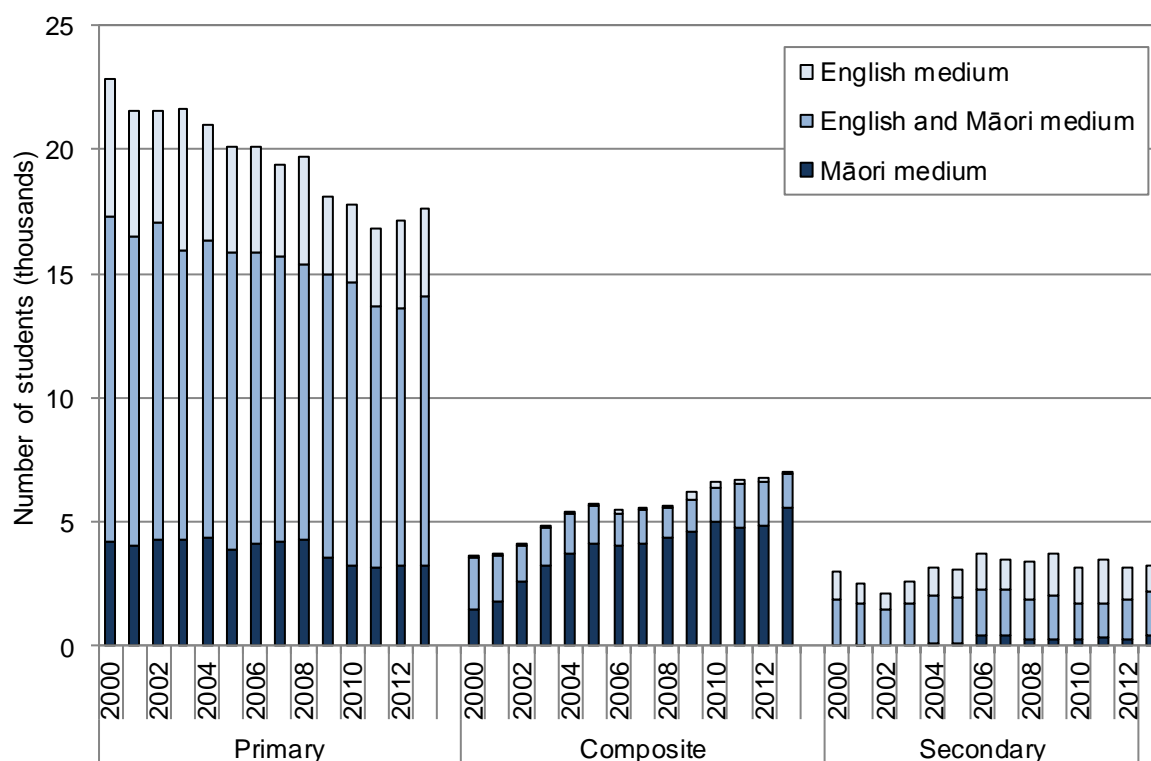
Number of Kura Kaupapa Māori and Kura Teina

In New Zealand since 2000, there has been a substantial increase in the number of kura kaupapa Māori and kura teina, with numbers increasing from 59 in 2000, to 72 in 2013 (Figure 65).

Māori Medium Education in New Zealand

While kura kaupapa Māori and kura teina offer a Māori language immersion environment, a number of other New Zealand schools offer some of their curriculum in Māori, with the degree of Māori medium learning often being divided into 4 levels: Level 1: 81–100%; Level 2: 51–80%; Level 3: 31–50%; Level 4(a): 12–30%. Thus a number of New Zealand students also have access to some of their educational curriculum in the Māori language in a primary or secondary school setting (Figure 66, Table 24).

Figure 66. Number of students involved in Māori medium education by school sector and form of education, New Zealand 2000–2012



Source: Ministry of Education. Data as at 1 July each year

Northern DHBs Distribution and Trends

Kura Kaupapa Māori and Kura Teina in the Northern DHBs

In the Northern DHBs during 2013, there were 20 kura kaupapa Māori, which between them enrolled a total of 1,836 students (Table 24).

Local Policy Documents That Consider Initiatives to Improve Educational Participation and Attainment for Māori Students

Table 26 (below) provides an overview of key policy documents and other publications relevant to Māori-medium education and educational achievement of Māori students.

Table 24. Number of kura kaupapa Māori schools and students, Northern DHBs vs. New Zealand 2000–2013

Year	Northland		Waitemata		Auckland DHB		Counties Manukau		New Zealand	
	No. Schools	No. Students	No. Schools	No. Students	No. Schools	No. Students	No. Schools	No. Students	No. Schools	No. Students
2000	5	391	3	320	2	168	3	294	59	4,964
2001	6	478	4	346	2	138	4	310	66	5,018
2002	7	626	4	321	2	142	5	365	70	5,428
2003	8	635	4	359	2	145	5	415	72	5,794
2004	8	714	4	361	2	125	6	494	72	5,996
2005	8	807	4	379	2	120	6	542	73	6,181
2006	8	820	4	377	2	123	6	489	74	6,160
2007	8	814	4	356	2	137	6	522	73	6,272
2008	9	805	4	321	2	158	6	493	73	6,189
2009	9	773	4	326	2	165	6	432	73	6,015
2010	9	813	4	309	2	152	6	422	73	6,038
2011	9	877	3	328	2	196	6	370	72	6,132
2012	9	915	3	332	2	216	6	324	72	6,169
2013	9	970	3	304	2	228	6	334	72	6,409

Source: Ministry of Education

Table 25. Number of students (Māori and non-Māori) involved in Māori medium education by regional council and level of Māori language immersion, New Zealand July 2013

Regional council	Level of Māori language immersion								Total	
	Level 1		Level 2		Level 3		Level 4(a)			
	81–100%		51–80%		31–50%		12–30%			
	Non Māori	Māori	Non Māori	Māori	Non Māori	Māori	Non Māori	Māori	Non Māori	Māori
Northland	7	1,241	28	749	92	973	112	727	239	3,690
Auckland	36	2,011	77	1,075	197	1,061	383	428	693	4,575
Waikato	15	2,369	27	476	83	371	132	379	257	3,595
Bay of Plenty	11	2,426	29	878	44	803	784	1,445	868	5,552
Gisborne	<5	799	7	164	15	407	29	437	55	1,807
Hawke's Bay	<5	689	16	339	5	133	<5	48	26	1,209
Taranaki	<5	129	<5	95	24	86	39	59	67	369
Manawatu-Wanganui	6	692	67	515	74	248	61	290	208	1,745
Wellington	10	1,110	35	169	17	152	105	139	167	1,570
Tasman		57	<5	33					<5	90
Nelson		<5	22	146					22	147
Marlborough							8	18	8	18
Canterbury	<5	261	30	224	31	17	11	22	74	524
West Coast			19	39			18	17	37	56
Otago	<5	32	<5	13		10	<5	15	7	70
Southland		113	<5	30					<5	143
New Zealand	98	11,930	370	4,945	582	4,261	1,694	4,024	2,744	25,160

Source: Ministry of Education

Table 26. Key local policy documents and other publications relevant to Māori-medium education and educational achievement of Māori

Ministry of Education publications
<p>Ministry of Education. 2013. Ka Hikitia Accelerating success 2013–2017: The Māori education strategy. Wellington: Te Kawanatanga o Aotearoa. http://www.minedu.govt.nz/~media/MinEdu/Files/TheMinistry/KaHikitia/KaHikitiaAcceleratingSuccessEnglish.pdf</p> <p>Ka Hikitia is a strategy to improve the performance of the education system to ensure Māori students achieve educational success, and builds on the principles, priorities and foundations for change within the earlier programme <i>Ka Hikitia—Managing for success 2008–2012</i>. Education that reflects and values Māori identity, culture and language is a central focus within the strategy, with the outcome measure that all Māori students have access to high quality Māori language in education. Māori language in education includes both Māori medium and Māori language in English medium. Embedding Māori language throughout the education system from early childhood to tertiary education supports identity, language and culture as critical ingredients for the success of all Māori students.</p>
<p>Ministry of Education. 2012. Te Marautanga o Aotearoa Whakapākehātanga. Wellington: Ministry of Education. http://tmoa.tki.org.nz/Te-Marautanga-o-Aotearoa</p> <p>Te Marautanga o Aotearoa (TMOA) provides a curriculum framework that meets the specific needs of students in Māori-medium schools and settings. This Curriculum upholds the cultural identity and heritage of learners and their families and outlines the essential knowledge, skills, values and attitudes appropriate to Māori-medium schools. Boards of Trustees, through the principal and staff, are required to develop and implement a curriculum for students in years 1–13 that is underpinned by a graduate profile developed in consultation with its community, whānau, hapū and iwi, and supports students to reach their bilingual potential. Kura must provide all students in years 1–10 with effectively taught programmes of learning in Te Reo Māori, Pāngarau (mathematics), Hauora (health and well-being), Tikanga-ā-lwi (social studies), Ngā Toi (arts), Pūtaiao (science), Hangarau (technology) and Te Reo Pākehā (English language). Students can choose to study specific subjects within these broad areas in more depth in Years 11–13.</p>
<p>Ministry of Education. 2013 Ngā Whanaketanga Rumaki Māori Achievement Information. Wellington: Ministry of Educat. http://www.educationcounts.govt.nz/statistics/schooling/nga-whanaketanga-rumaki-māori-achievement-results</p> <p>Schools and kura that use Te Marautanga o Aotearoa monitor the performance of students using Ngā Whanaketanga Rumaki Māori. This tool assesses progress and achievement in four areas of learning using a four-point scale: Manawa Toa (higher than expected); Manawa Ora (as expected); Manawa Āki (progressing but requires further support to assist achievement); and Manawa Taki (requires in-depth support to assist achievement). Results from 117 of the 200 schools and kura using Te Marautanga o Aotearoa in 2013 showed a high proportion of students achieving at Manawa Toa or Manawa Ora levels as follows: pānui (reading) 69.5%; tuhituhi (writing) 61.1%; kōrero (spoken language) 61.2%; and pāngarau (mathematics) 62.2%. The low reporting rate means that these data must be interpreted with care.</p>
<p>Wang H & Harkess C. 2007. Senior Secondary Students' Achievement at Māori-Medium Schools. Wellington: Ministry of Education. http://www.educationcounts.govt.nz/publications/91416/105966/14593</p> <p>The authors analysed key statistics concerning the performance of Year 11–13 students at Māori-medium (Māori immersion and bilingual) schools from 2004–2006. There was a relatively small number of secondary school students involved in Māori-medium education in this time period, and data analysis was further compromised by changing classification of schools as Māori immersion or bilingual from year to year. Acknowledging these limitations, the key results were that Year 11–13 candidates at Māori-medium schools were more likely than their Māori peers at English-medium schools to gain a typical level or higher NCEA qualification, to meet the University Entrance requirements by the end of Year 13 and to meet both the literacy and numeracy requirements for NCEA Level 1 by the end of Year 11.</p>
<p>Tākao N, et al. 2010. Te Piko o te Māhuri: The key attributes of successful Kura Kaupapa Māori. http://www.educationcounts.govt.nz/data/assets/pdf_file/0005/81158/954-KWA-English-21092010.pdf</p> <p>This research project used a strengths based approach to focus on what is working well in Kura Kaupapa Māori and to identify the key elements that make up a Kura Whai Angitu (a successful kura). The research findings were methodically crafted from the rich stories and data collected in field visits to five successful Kura Kaupapa Māori. The key attributes of successful kura identified by this research include an absolute focus on nurturing the potential of the child, a fervent and ongoing commitment to the revitalisation of the Māori language, teaching and learning practice underpinned by Māori principles embedded in the social fabric of the kura and explicit aspirational goals for all graduates of these kura to become 'high achievers who exemplify the hopes and aspirations of their people'.</p>
Other relevant publications
<p>McKinley E. 2005. Locating the global: Culture, language and science education for indigenous students. <i>International Journal of Science Education</i>, 27(2), 227–41.</p> <p>This paper argues that one of the main ways in which indigenous knowledge systems will survive and thrive is through the establishment of programmes taught through indigenous languages. The author examines the use of indigenous knowledge including traditional ecological knowledge in the teaching of science in a global setting. The article concludes with a review of science teaching using Te Reo Māori in Aotearoa New Zealand.</p>
Website
<p>Māori education: Ministry of Education http://www.minedu.govt.nz/NZEducation/EducationPolicies/MaoriEducation.aspx</p>
<p>Note: the publications listed were identified using the search methodology outlined in Appendix 1</p>

HIGHEST EDUCATIONAL ATTAINMENT AT SCHOOL LEAVING

Introduction

In a knowledge-based society such as New Zealand, access to tertiary education and entry level jobs requires young people to have formal school qualifications. A National Certificate of Educational Achievement (NCEA) Level 2 qualification is the desired minimum qualification for school leavers, giving them opportunities in terms of further education, employment, health outcomes and a better quality of life [70]. The New Zealand Government has set a target of 85% of 18-year-olds achieving NCEA Level 2 or an equivalent qualification in 2017; this target was met by 78.6% of 18-year-olds in 2013 [71].

The Government has identified Māori students, Pasifika students, students from low socio-economic families and students with special education needs as its priority students. Although many students from these groups achieve at high levels within education, student achievement data also show that students from these groups are over represented among those students the system has struggled to support [72].

Achieving the desired outcomes in learning relies not only on the student or the family however, but also on their interactions with the education system itself. A number of systemic improvements can assist in meeting national educational priorities, including school leadership, teacher professional learning and development, and the provision of quality teaching for diverse (all) learners [73].

The following section uses information from the Ministry of Education to review the highest educational attainment of school leavers during 2009–2013.

Data Source and Methods

Indicators

1. School leavers with no qualifications
2. School leavers with NCEA Level 1 or higher
3. School leavers with NCEA Level 2 or higher
4. School leavers with a University Entrance Standard

Numerator: Number of students leaving school with no qualifications, NCEA Level 1 or higher, NCEA Level 2 or higher, or a University Entrance Standard

Denominator: Number of school leavers in a given year

Data Source

Ministry of Education <http://www.educationcounts.govt.nz/>

Definition

The National Certificate of Educational Achievement (NCEA) is part of the National Qualifications Framework. In 2002 all schools implemented NCEA Level 1, replacing School Certificate. In 2003 NCEA Level 2 was rolled out, however, schools were still able to offer a transitional Sixth Form Certificate Programme. From 2004 onwards, Level 3 NCEA replaced Higher School Certificate and University Entrance/University Bursaries. In 2004 the Level 4 qualification, New Zealand Scholarship, was also offered:

(<http://www.educationcounts.govt.nz/indicators/definition/education-and-learning-outcomes/28879>).

There are three levels of NCEA certificate, depending on the difficulty of the standards achieved. At each level, students must achieve a certain number of credits, with credits being able to be gained over more than one year. The requirements for each level are:

NCEA Level 1: 80 credits at any level (level 1, 2 or 3) including literacy and numeracy

NCEA Level 2: 60 credits at level 2 or above + 20 credits from any level

NCEA Level 3: 60 credits at level 3 or above + 20 credits from level 2 or above.

Credits gained at one level can be used for more than one certificate and may also be used towards other qualifications. In addition, in order to attain University Entrance standard, students must achieve 42–59 credits at NCEA Level 3 or above, or another National Certificate at Level 3 with University Entrance requirements; or an Accelerated Christian Education (ACE) or overseas award (including International Baccalaureate) at Year 13, or a NZ Scholarship or National Certificate at Level 4.

Further detail see <http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/understanding-ncea/the-facts/factsheet-4/>

Notes on Interpretation

Note 1: These data follow a new definition of school leavers from the Ministry of Education's ENROL system utilised from 2009 onwards so comparison with previous years is not possible.

Note 2: Ethnicity is total response so individual students may appear in more than one ethnic group.

Note 3: Listed qualification levels include the NZ Qualifications Framework (NZQF) as well as other equivalent qualifications that are non-NZQF (such as Cambridge).

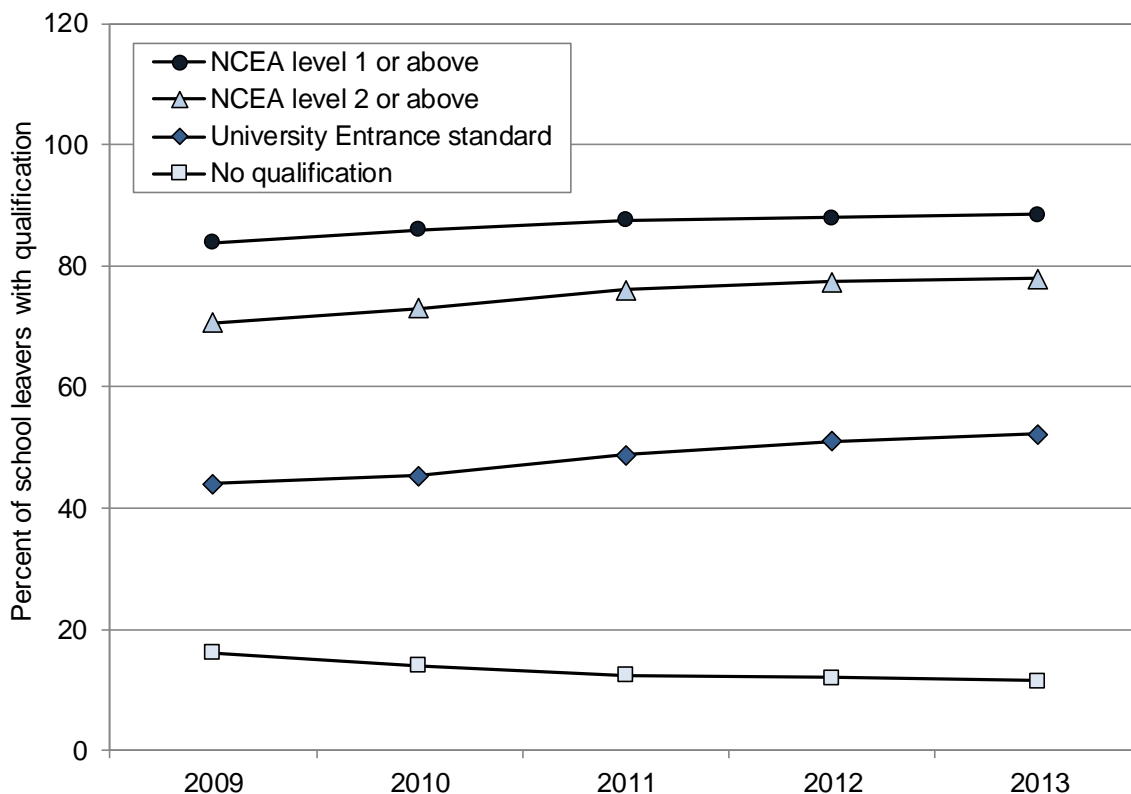
Note 4: **School Socioeconomic Decile:** All schools are assigned a decile ranking based on the socioeconomic status of the areas they serve. These rankings are based on Census data from families with school age children in the areas from which the school draws its students. Census variables used in the ranking procedure include equivalent household income, parent's occupation and educational qualifications, household crowding and income support payments. Using these variables, schools are assigned a decile ranking, with decile 1 schools being the 10% of schools with the highest proportion of students from low socioeconomic communities and decile 10 schools being the 10% of schools with the lowest proportion of these students. Decile ratings are used by the Ministry of Education to allocate targeted funding, as well as for analytical purposes.

New Zealand Distribution and Trends

New Zealand Distribution

In New Zealand during 2013, 11.5% of students left school with no formal qualifications, while 88.5% left with NCEA Level 1 or above, 78.0% left with NCEA Level 2 or above, and 52.2% attained a University Entrance standard. While the proportion of students leaving with no formal qualifications declined during 2009–2013, the proportion attaining a University Entrance standard increased (Figure 67).

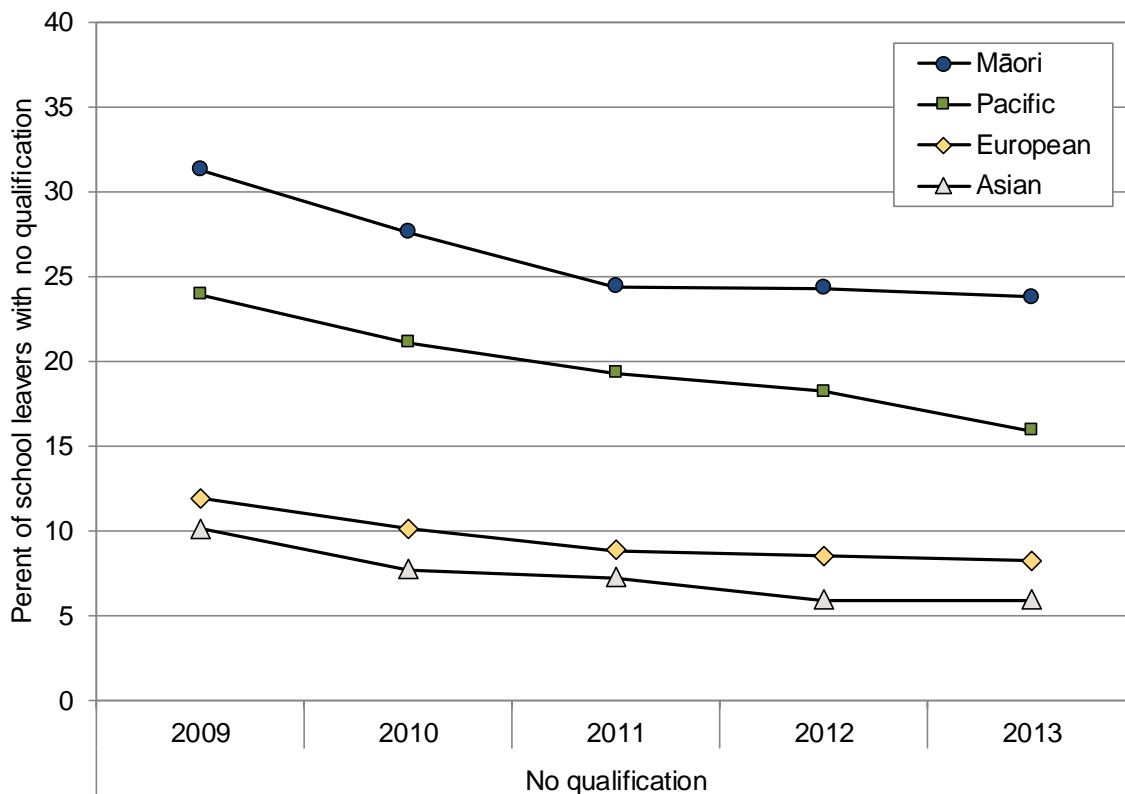
Figure 67. Highest educational attainment of school leavers, New Zealand 2009–2013



Source: Ministry of Education

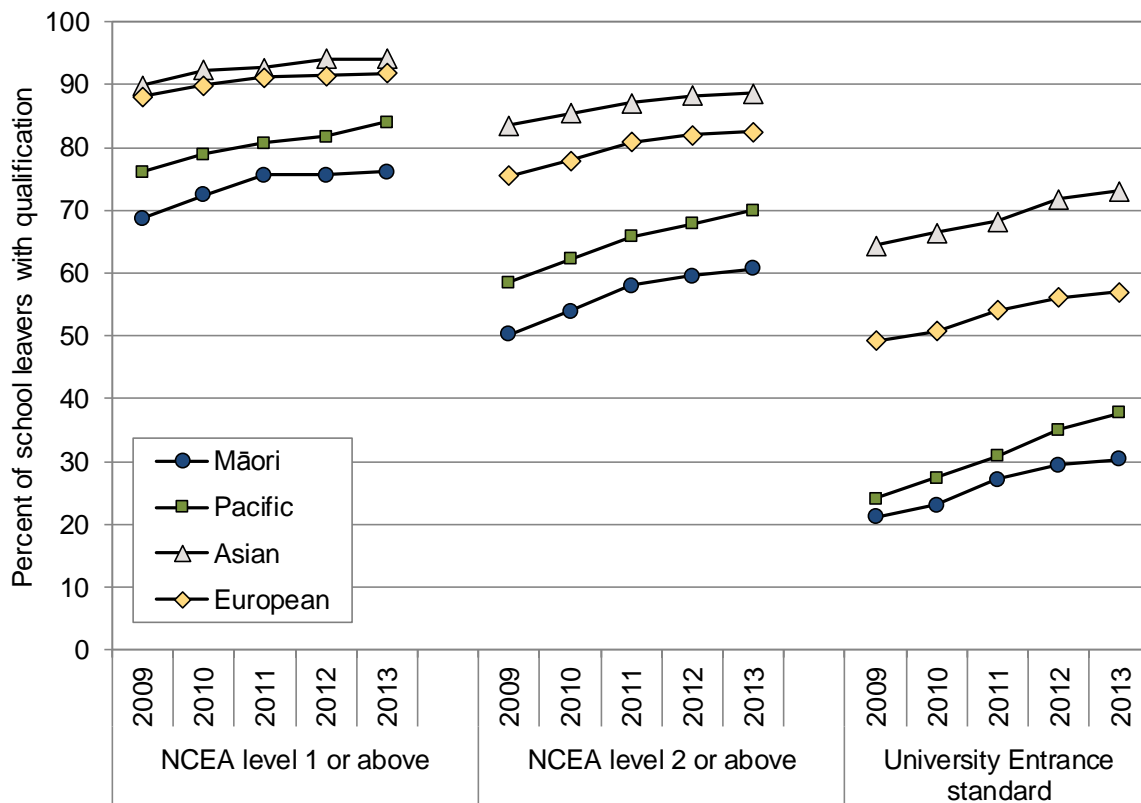


Figure 68. School leavers with no qualifications by ethnicity, New Zealand 2009–2013



Source: Ministry of Education; Note: Ethnicity is total response and thus individual students may appear in more than one ethnic group

Figure 69. Highest educational attainment of school leavers by ethnicity, New Zealand 2009–2013



Source: Ministry of Education; Note: Ethnicity is total response and thus individual students may appear in more than one ethnic group

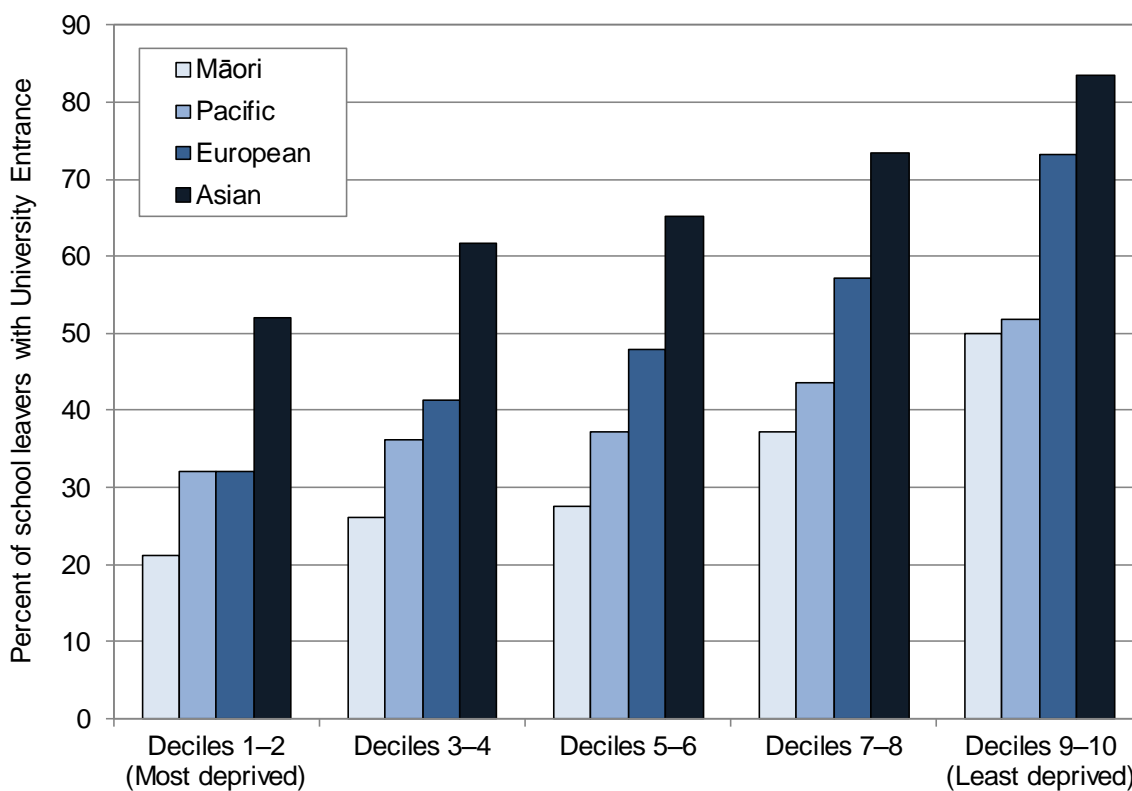
Distribution by Ethnicity

In New Zealand during 2009–2013, a higher proportion of Māori > Pacific > European > Asian students left school with no formal qualifications, while a higher proportion of Asian > European > Pacific > Māori students attained NCEA Level 1 or more, NCEA Level 2 or more, or a University Entrance standard. During this period, the proportion of students with no formal qualifications declined, while the proportion attaining a University Entrance standard increased for all ethnic groups (**Figure 68**, **Figure 69**).

Distribution by Ethnicity and School Socioeconomic Decile

In New Zealand during 2013, the proportion of students achieving a University Entrance standard increased with increasing school socioeconomic decile, however, at each level of socioeconomic deprivation a higher proportion of Asian > European > Pacific and Māori students attained a University Entrance standard (**Figure 70**).

Figure 70. School leavers with a University Entrance Standard by ethnicity and school socioeconomic decile, New Zealand 2013



Source: Ministry of Education; Note: Ethnicity is total response and thus individual students may appear in more than one ethnic group

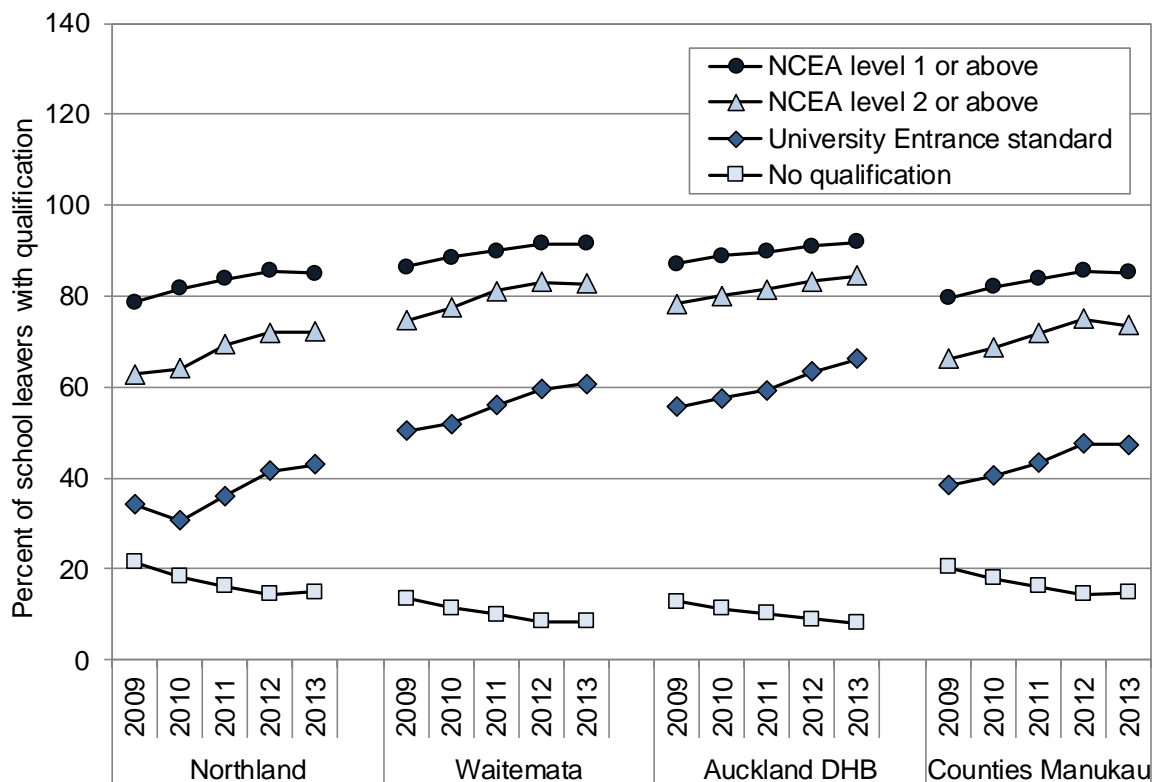
Northern DHBs Distribution and Trends

Northern DHBs Distribution

In all four of the Northern DHBs during 2009–2013, the proportion of students leaving school with no qualifications declined, while the proportion leaving with a University Entrance standard increased. The proportion leaving school with a University Entrance standard was highest in the Auckland and Waitemata DHBs, while the proportion leaving with no qualifications was highest in Northland and Counties Manukau (**Figure 71**).

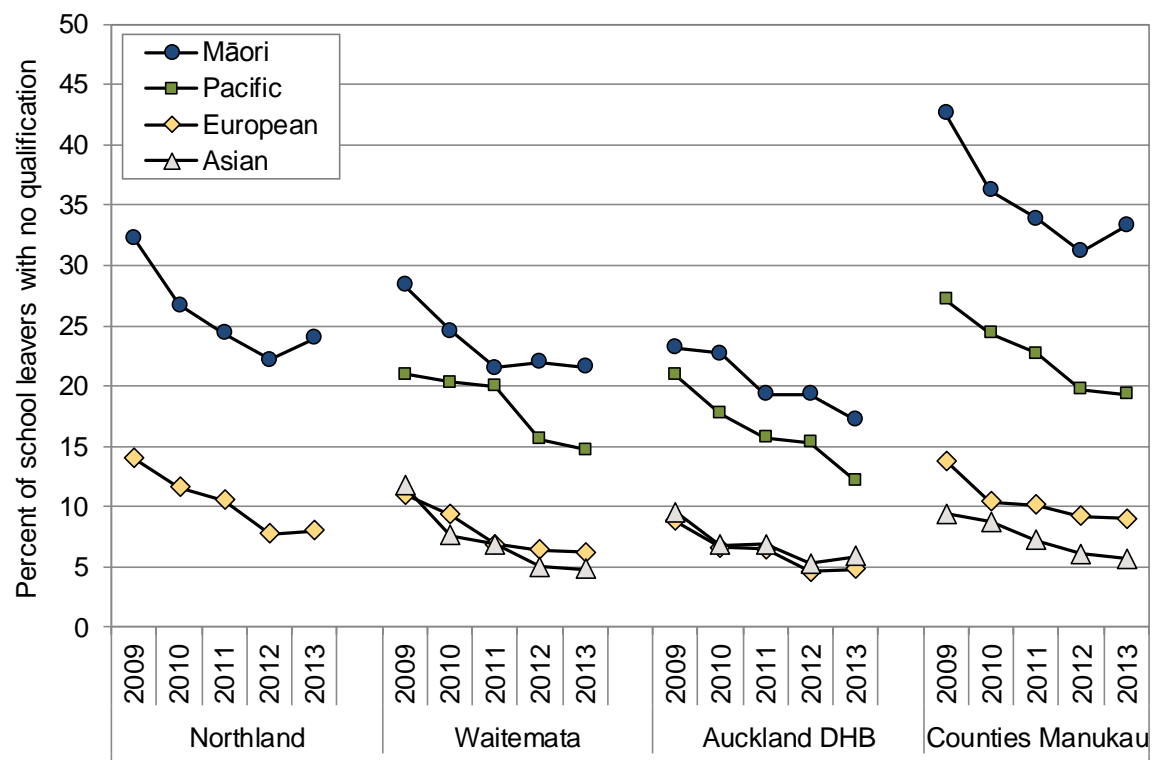


Figure 71. Highest educational attainment of school leavers, Northern DHBs 2009–2013



Source: Ministry of Education

Figure 72. School leavers with no qualifications by ethnicity, Northern DHBs 2009–2013



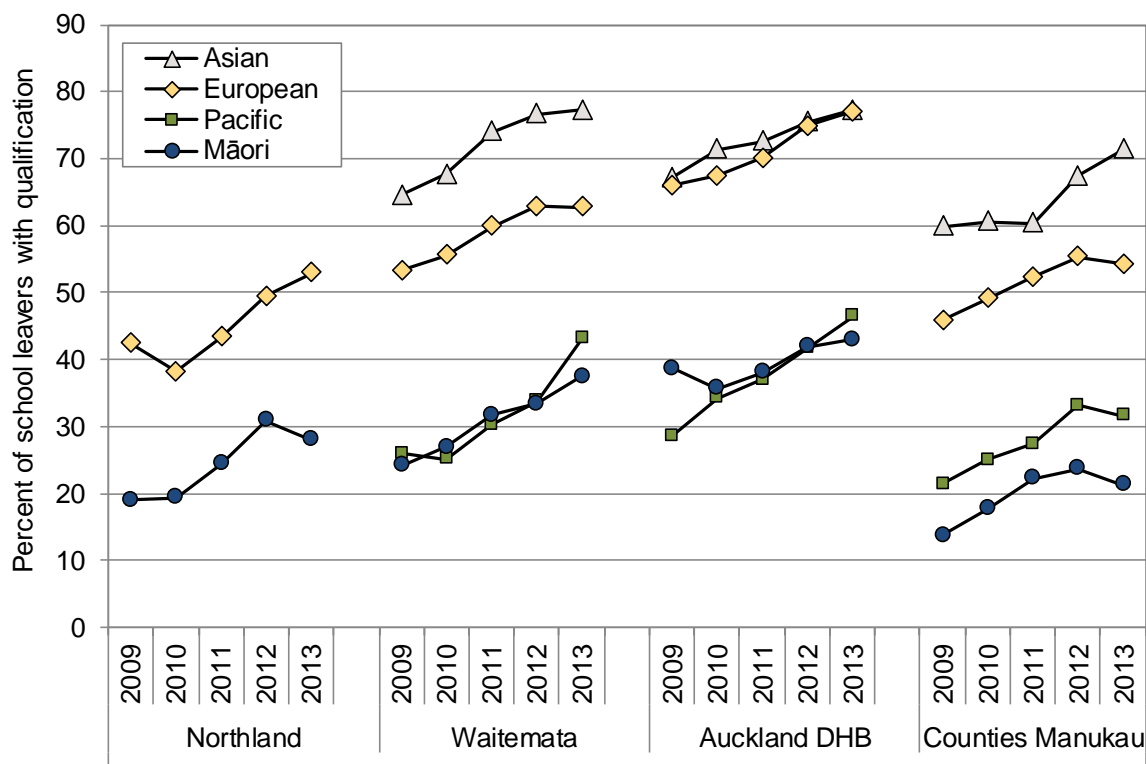
Source: Ministry of Education; Note: Ethnicity is total response and thus individual students may appear in more than one ethnic group

Distribution by Ethnicity

In the Waitemata, Auckland and Counties Manukau DHBs during 2009–2013, a higher proportion of Māori > Pacific > European and Asian students left school with no qualifications, while in Northland rates were higher for Māori than for European students (**Figure 72**).

In the Waitemata, Auckland and Counties Manukau DHBs during 2009–2013, a higher proportion of Asian and European students left school with a University standard than Pacific or Māori students, while in Northland rates were higher for European than for Māori students (**Figure 73**).

Figure 73. School leavers with University Entrance standard, Northern DHBs 2009–2013



Source: Ministry of Education; Note: Ethnicity is total response and thus individual students may appear in more than one ethnic group

Local Policy Documents and Evidence Based Reviews Relevant to Student's Educational Attainment

Table 27 (below) reviews local policy documents and evidence based reviews which consider strategies to improve student's educational attainment. Student's attainment however, is also heavily influenced by prior participation in early childhood education, and a positive engagement with the education system. In this context, **Table 22** on page 118 provides an overview of publications which are relevant to early childhood education, while **Table 26** on page 125 reviews publications which consider initiatives to improve the educational participation and attainment of Māori students. **Table 28** on page 148 reviews publications relevant to the prevention of stand-downs, suspensions, exclusions and expulsions, while **Table 29** on page 156 considers publications relevant to improve school attendance.



Table 27. Local policy documents and evidence based reviews relevant to students' educational attainment

Ministry of Health publications
<p>Ministry of Health. 2014. Māori Participation and Attainment in Science Subjects (aged 15 to 17 years) 2008 to 2012. http://www.health.govt.nz/publication/maori-participation-and-attainment-science-subjects-aged-15-17-years-2008-2012 accessed 13 November 2014</p> <p>The Ministry of Health monitors Māori students' participation and achievement in science subjects as part of a wider workforce strategy. Increasing the number of Māori health professionals is essential to improve health outcomes for Māori at a population level, including the health of Māori children, and providing appropriate care to all New Zealanders. Studying science subjects at school remains a prerequisite for Māori candidates wanting to become health professionals and also opens doors into careers in a range of sport and science-related professions. The spreadsheet linked to this webpage provides details of the National Certificate of Educational Achievement (NCEA) participation and achievement in science of Māori students aged 15–17 years nationally and in each DHB. At a national level from 2008–2012 there was an increase in the number of Māori candidates who attained 14 or more credits in a science subject in each age group. However a significant disparity was evident between the attainment rate for Māori candidates compared with non-Māori at all ages in each year. At age 15 only, the percentage increase in attainment for Māori candidates was greater than the percentage increase for non-Māori candidates (5% rate increase for Māori compared with 3.7% for non-Māori). There was no lessening of disparity at ages 16 or 17.</p>
Ministry of Education publications
<p>Alton-Lee A. 2012 The use of evidence to improve education and serve the public good. Wellington: Hei Kete Raukura, Ministry of Education. http://www.educationcounts.govt.nz/_data/assets/pdf_file/0014/108023/Evidence-for-Improvement-and-Public-Good.pdf</p> <p>This report focuses on three approaches for mobilising research to improve outcomes for diverse learners across the school system: best evidence synthesis; effective leadership, professional learning, and development and teaching; and the use of enquiry and knowledge building tools and exemplars. The authors emphasise using evidence to strategically resource improvements and to focus on improving valued outcomes for all learners, with accelerated improvement for those underserved by schooling or disadvantaged, and enabling local responsiveness. Having trustworthy evidence and knowledge of effective pedagogy should address the questions of what does or does not work and, as in health, the underlying principle is to first do no harm. For success in improving learner outcomes, attention has to be paid to fostering trustworthy relationships, stakeholder ownership and capacity building. Four major areas of influence for accelerated improvement are pedagogy, educationally powerful connections, professional learning, and leadership. In times of fiscal crisis, success requires all these influences to be acting together.</p>
<p>Biddulph F, et al. 2003. The Complexity of Community and Family Influences on Children's Achievement in New Zealand: Best Evidence Synthesis. Wellington. Ministry of Education. http://www.educationcounts.govt.nz/publications/series/2515/5947</p> <p>This report is one of a series of best evidence syntheses commissioned by the Ministry of Education. It considers the roles families/whānau and communities play in influencing outcomes for children. These outcomes include both social and academic achievement. The focus is on children from early childhood through to the end of secondary schooling. The synthesis is based on a wide range of New Zealand data (and cautiously informed by a number of overseas studies), with the findings being summarised into four categories: family attributes, family processes, community factors, and centre/school, family and community partnerships.</p>
Ministry of Social Development documents
<p>Ministry of Social Development. 2014. Youth Service Evaluation Report. Wellington: Ministry of Social Development. http://www.msd.govt.nz/about-msd-and-our-work/publications-resources/evaluation/youth-service/evaluation-report.html</p> <p>Since August 2012 the Ministry of Social Development has contracted community-based service providers to work intensively with young people aged 16–18 years who are at risk of long-term benefit dependency, to provide a wrap-around service (Youth Service: YS) that supports them into education, training or work-based learning. In the first 12 months since enrolment YS participants were more likely than non-enrolled peers to increase the number of National Certificate in Educational Achievement (NCEA) credits that they held, but were less likely than the comparison group to have met the requirements of NCEA level 2 (partly because of a lower baseline qualification level between the two groups). Most YS participants have experienced difficulties with mainstream education, and it can take several months of support to enrol a participant in educational activity.</p>

International guidelines

National Institute for Health and Clinical Excellence. 2009. **Social and emotional wellbeing in secondary education**. London: National Institute for Health and Clinical Excellence. <https://www.nice.org.uk/guidance/PH20>

Good social skills, positive relationships and resilience can protect young people against low self-esteem and problematic behaviour and help them to benefit from educational opportunities. While recognising that a range of factors, including individual make-up, family background, local community characteristics and society at large affect young peoples' development, secondary education establishments can provide an environment that fosters social and emotional wellbeing and equips young people with the knowledge and skills they need to learn effectively. This National Institute for Health and Clinical Excellence (NICE) guidance focuses on universal interventions used to support all young people rather than targeted approaches. Despite limitations of the evidence, NICE identified a number of principles for good practice and developed recommendations using expert advice, stakeholder comments and fieldwork alongside a review of the evidence and an economic analysis. Strong leadership and good management and organisation appear to be prerequisites for successful interventions. Other key factors in promoting social and emotional wellbeing in secondary education include a supportive and secure environment, an ethos that avoids stigma and discrimination in relation to mental health and social and emotional difficulties, support for students with special needs, access to the specialist skills, advice and support that secondary schools require, staff with the knowledge, understanding and skills they need to develop young people's social and emotional wellbeing and social and emotional skills education tailored to the developmental needs of young people.

Evidence-based medicine reviews

Langford R, et al. 2014. **The WHO Health Promoting School framework for improving the health and well-being of students and their academic achievement**. Cochrane Database of Systematic Reviews(4). Art. No.: CD008958. DOI: 10.1002/14651858.CD008958.pub2.

<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD008958.pub2/abstract>

The strong relationship between health and education, whereby healthy children achieve better results at school which are associated with improved health throughout life, forms the basis of the World Health Organization's (WHO) Health Promoting Schools (HPS) framework which is a holistic, settings-based approach to promoting health and educational attainment in school. The effectiveness of this approach has not been previously rigorously reviewed. The authors included 67 eligible cluster trials, randomising 1,443 schools or districts which tackled a range of health issues. The quality of evidence overall was low to moderate with heavy reliance on self-reported data, high attrition rates for some studies and a lack of long-term follow-up data for most studies. Where there were sufficient data for meta-analysis the authors found small but positive effects with potential to produce public health benefits at the population level in some interventions for body mass index (BMI), physical activity, physical fitness, fruit and vegetable intake, tobacco use, and being bullied. There was little evidence of effectiveness for standardised body mass index (zBMI) and no evidence of effectiveness for fat intake, alcohol use, drug use, mental health, violence and bullying others; however, only a small number of studies focused on these latter outcomes. Unfortunately few studies included any academic, attendance or school-related outcomes and it was not possible to draw any clear conclusions as to the effectiveness of this approach for improving academic achievement.

Other relevant publications

Education Review Office. 2014. **Achievement 2013–2017: Success for students in 2013**. Wellington: New Zealand Government. <http://www.ero.govt.nz/National-Reports/Achievement-2013-2017-Success-for-students-in-2013-November-2014>

This report presents the findings of an evaluation of the Ministry of Education's initiative Achievement 2013–2017, which involved schools and the Ministry working together to improve student achievement. In 2013, 2,701 students from 129 schools who were unlikely to gain NCEA Level 2 without additional support were given additional support by leaders and teachers. Sixty percent of the students achieved NCEA Level 2 in 2013. Leaders also reported that attendance had improved and the students were more engaged as a result of the support. Key components of the intervention were carefully matching each student with a caring, supportive adult who had regular conversations with them regarding their learning; timely monitoring of students' progress and achievement and maximising learning opportunities for students with extra targeted teaching provided both during and outside regular school hours. A few schools actively fostered family and whānau support with some schools using texting to maintain regular contact with parents and whānau. As this was an uncontrolled study it is not possible to analyse the effect of the intervention compared with usual practice.

Buckley S & Maxwell G. 2007. **Respectful schools restorative practices in education**: A summary report.
Wellington: Office of the Children's Commissioner & Institute of Policy Studies, Victoria University.
<http://www.occ.org.nz/assets/Uploads/Reports/Education/Respectful-schools.pdf>

Respectful Schools summarises findings from a study of New Zealand secondary schools' restorative practices. Such practices, based on restorative justice principles, have been seen as a possible approach to behaviour problems and underachieving among students. Interviews and discussions were held in fifteen schools that had introduced restorative practices, and case studies showing successful practice are presented for five of the schools, briefly explaining how the system was introduced and used. The report provides a brief summary of the New Zealand context highlighting important reasons why New Zealand has the school failure rate it does. It notes that new educational approaches and strategies are emerging that involve the use of new practices which promote values and goals built around respect, inclusion and restoration. The main audience for this report is members of school communities interested in implementing restorative approaches within their own schools and communities, but the content is relevant to other sectors working with schools and young people.

Note: The publications listed were identified using the search methodology outlined in **Appendix 1**

SENIOR SECONDARY SCHOOL RETENTION AND TERTIARY PARTICIPATION

Introduction

Participation is a key factor associated with academic achievement at secondary school. To achieve, students need to be at school, experience a sense of belonging, and stay interested and engaged in learning. There is a strong correlation between early school leavers and unemployment and/or lower incomes. School attendance is legally required in New Zealand until the child is aged 16 years. However parents of students aged 15 years are able to apply to the Ministry of Education for an exemption on the basis of educational problems, conduct, or the unlikelihood that a student will obtain benefit from attending school. Since the Ministry of Education strengthened its early leaving application and approval process in 2007, the number of applications for early leaving exemptions has dropped sevenfold from around 70 applications per 1,000 15-year-old students in 2006 to around 10 applications per 1,000 15-year-old students in 2013. There was a slight increase in the number of exemptions granted between 2012 and 2013 (from 313 to 422 exemptions) due, in part, to the Youth Guarantee initiative which provides opportunity to achieve NCEA Level 2 or equivalent outside of school. The majority (79%) of 15-year-old students who received an early leaving exemption (exempt school leavers) were leaving to attend a Training Provider course, with 12% exempt school leavers planning to enrol in a Polytechnic course and 9% of exempt school leavers entering full-time employment [74].

The scope of the tertiary education sector ranges from informal non-assessed community courses through to undergraduate degrees and advanced, research-based postgraduate degrees. Changes in participation and achievement in tertiary education are indicators of the extent to which New Zealanders are developing the skills needed for a modern knowledge economy. The New Zealand participation rate in tertiary education has declined from a peak of 13.7% in 2005 to 10.6% in 2012. This decline was due mainly to decreased participation in non-degree courses such as levels 1–4 Certificates and Diplomas. From 2005–2012 there have been very slight increases in the proportion of the population undertaking study for bachelor degrees, honours and post-graduate certificates and diplomas, and doctoral degrees, and a slight decrease in the participation rates for masters degrees. Females participate in tertiary study at a higher rate than males (12.2% vs. 8.9%) and this gender disparity has been increasing for several years. After adjusting for differences in age distributions, 14.6% of Māori aged 15 and over participated in tertiary education in 2012. The Māori participation rate was higher than other ethnic groups Asian (9.6%), European/Pākehā (9.7%), and Pasifika (11.4%). When broken down by level of study, Māori currently have substantially higher rates at non-degree level, while non-Māori participation rates are highest at degree level and above [75].

The following section uses Ministry of Education data to review the proportion of senior secondary school students staying on at school until at least seventeen years of age and tertiary participation rates.

Data Source and Methods

Indicators

1. *The proportion of secondary school students staying on at school until at least 17 years of age*

Numerator: ENROL: The number of school leavers aged 17 years or above in a given year

Denominator: ENROL: The total number of school leavers in a given year

2. *Age-standardised participation rates in tertiary education*

Numerator: The total number of students aged 15 years and over who were enrolled in a qualification, in either a public tertiary institution or publicly funded private tertiary institution, at some time during a particular year

Denominator: The 2013 New Zealand population age distribution

Data Source

Ministry of Education

Notes on Interpretation



Retention

Note 1: From 2009 a new way of categorising school leavers has been used that more accurately records school leaver numbers. Thus the data presented in this section are not comparable with previous years.

Note 2: DHB Area is based on the school that students attended rather than their residential address.

Note 3: NZAID students (foreign students sponsored by the NZ Agency for International Development), and foreign fee paying students have been excluded.

Note 4: Ethnicity is total response and thus individual students may appear in more than one ethnic group.

Further detail is available from: <http://www.educationcounts.govt.nz/indicators/definition/student-engagement-participation/3945>

Age standardised participation rates

Note 5: The age-standardised participation rate is one where all subgroups being compared are artificially given the same age distribution, with the tertiary participation rates presented here being standardised to Statistics New Zealand's 2013 national population estimates. As participation is highest in the 18–24 age group, standardising for age removes any differences arising from one group having a different age structure to another. As such, the standardised rate is an artificial measure, but it does provide an estimate of how groups might more fairly compare if they had the same age distribution.

Note 6: Data relate to domestic students enrolled at any time during the year with a tertiary education provider in formal qualifications of greater than 0.03 EFTS. Students who were enrolled at more than one qualification level have been counted in each level, but only once in the Total.

Note 7: Data exclude all non-formal learning and on-job industry training.

New Zealand Distribution and Trends

Senior Secondary School Retention

Distribution by Ethnicity

In New Zealand during 2009–2013, a higher proportion of Asian > European and Pacific > Māori students stayed at school to 17 years of age. During 2013, 93.9% of Asian students stayed at school to age 17 years, as compared to 85.1% of European, 81.3% of Pacific, and 67.9% of Māori students (**Figure 74**).

Participation in Tertiary Education

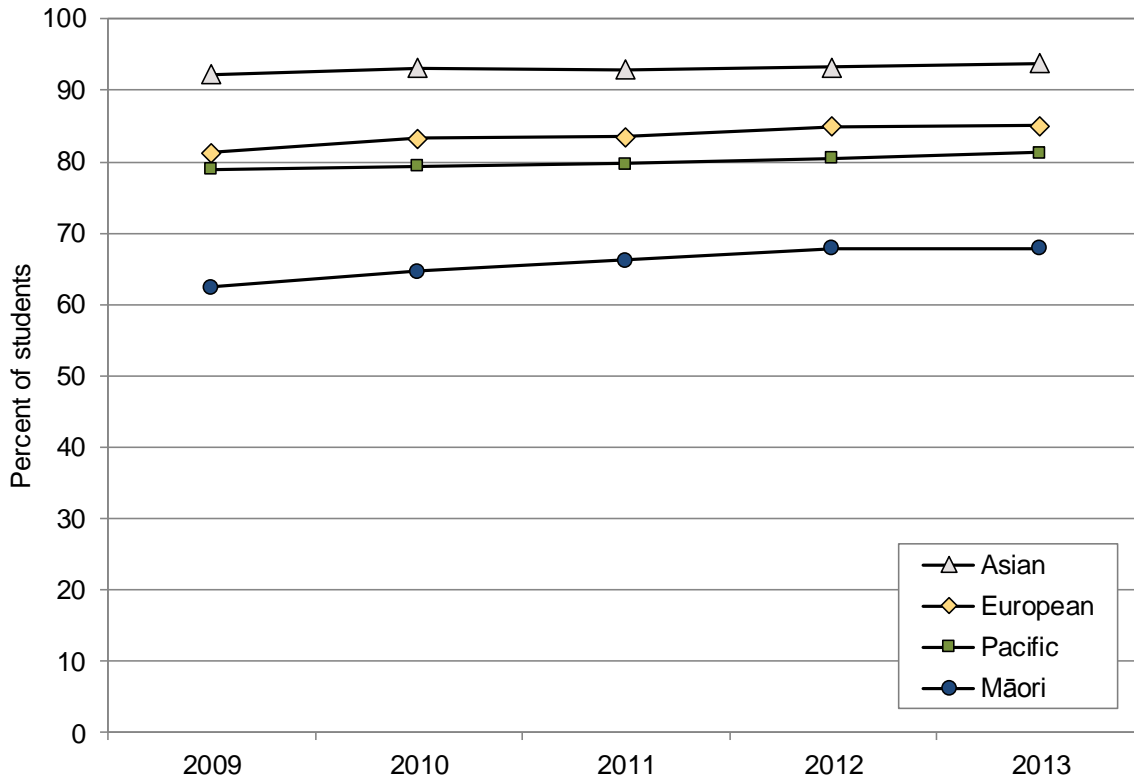
Distribution by Ethnicity

Ethnic differences in school retention rates at 17 years need to be viewed in the context of the alternative educational opportunities available to students. During 2006–2013, a large number of students participated in tertiary education, with Māori students having the highest participation rates (**Figure 75**). Māori students have high participation rates in Certificates and Diplomas, however, have low rates in Bachelors (**Figure 76**). Tertiary participation rates include those 25+ years and such figures suggest that for many, participation in formal education does not cease at school leaving. The income premiums achieved for completing various types of study need to be taken into consideration when assessing the longer term impacts educational participation has on economic security.

Note: Information on regional tertiary participation rates is not provided due to the large shifts in the New Zealand youth population that occur when young people around 17 years of age move from regional areas to large urban centres to take advantage of tertiary study opportunities. Regional participation rates are likely to reflect the number and type of tertiary institutions available in a region rather than the participation rates of young people who have grown up in a region, and/or who return to that region during their study breaks or vacations.

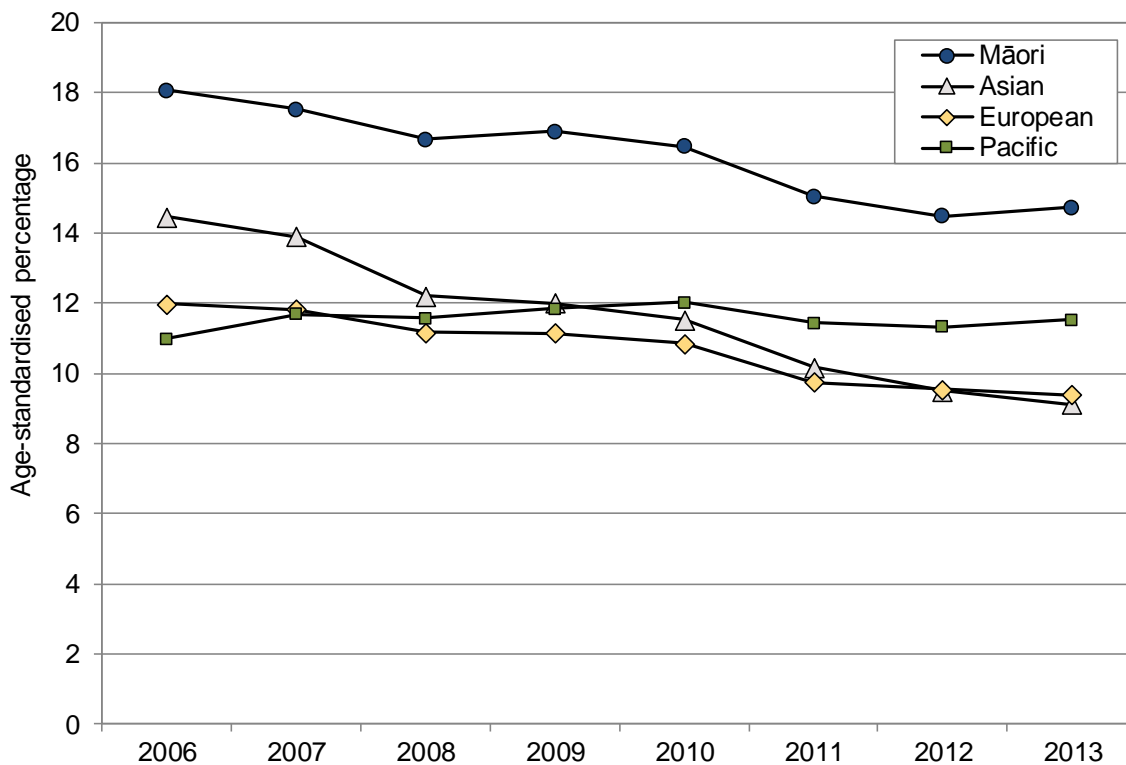


Figure 74. Percentage of secondary school students staying on at school to age 17 years by ethnicity, New Zealand 2009–2013



Source: Ministry of Education ENROL; Note: Ethnicity is total response and thus individual students may appear in more than one ethnic group

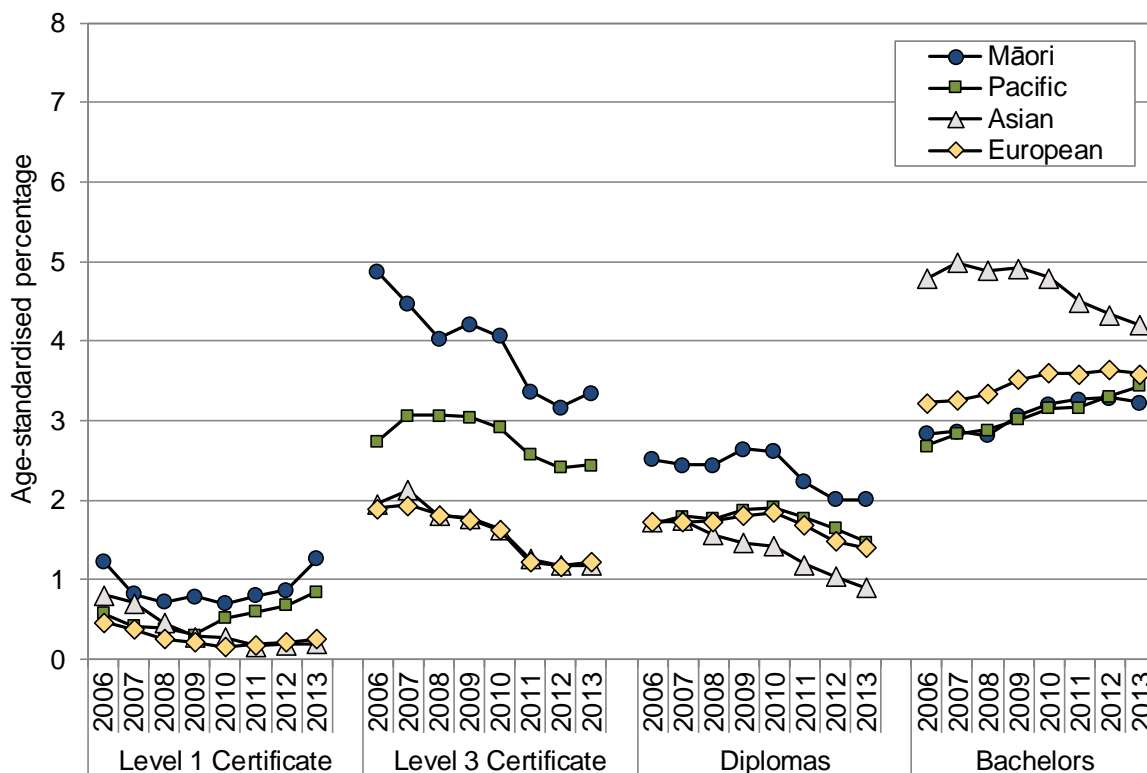
Figure 75. Age-standardised participation rates in tertiary education for domestic students by ethnicity, New Zealand 2006–2013



Source: Ministry of Education; Note: Total includes Level 1–4 Certificates, Diplomas, Bachelors, Level 7 Graduate Certificates/Diplomas, Level 8 Honours/Postgraduate Certificates/Diplomas, Masters, and Doctorates

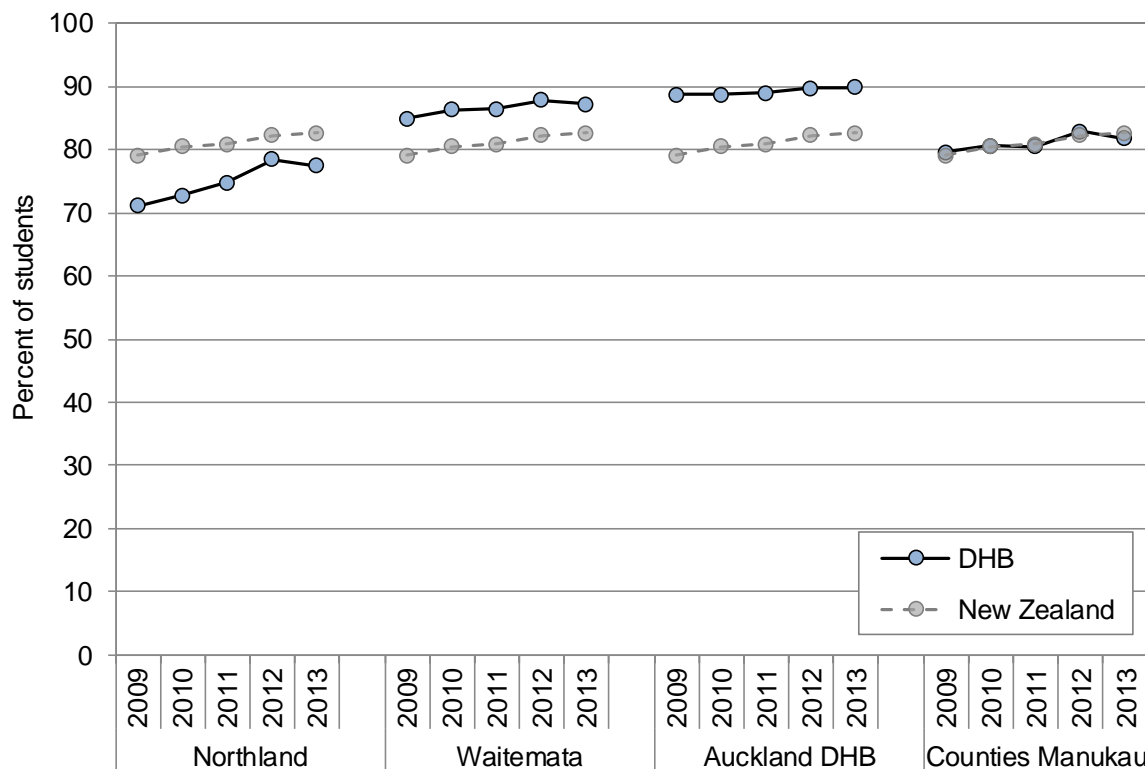


Figure 76. Age-standardised participation rates in tertiary education for domestic students by ethnicity and selected qualification, New Zealand 2006–2013



Source: Ministry of Education; Note: Ethnicity is total response and thus individual students may appear in more than one ethnic group; students enrolled in multiple qualification levels have been counted in each level

Figure 77. Percentage of secondary school students staying on at school to 17 years of age, Northern DHBs vs. New Zealand 2009–2013



Source: Ministry of Education ENROL



Northern DHBs Distribution and Trends

Northern DHBs vs. New Zealand

In the Waitemata and Auckland DHBs during 2009–2013, the proportion of students staying on at school to 17 years of age was higher than the New Zealand rate, while in Northland rates were consistently lower. In Counties Manukau, the proportion of students staying on at school to 17 years of age was similar to the New Zealand rate (**Figure 77**).

Distribution by Ethnicity

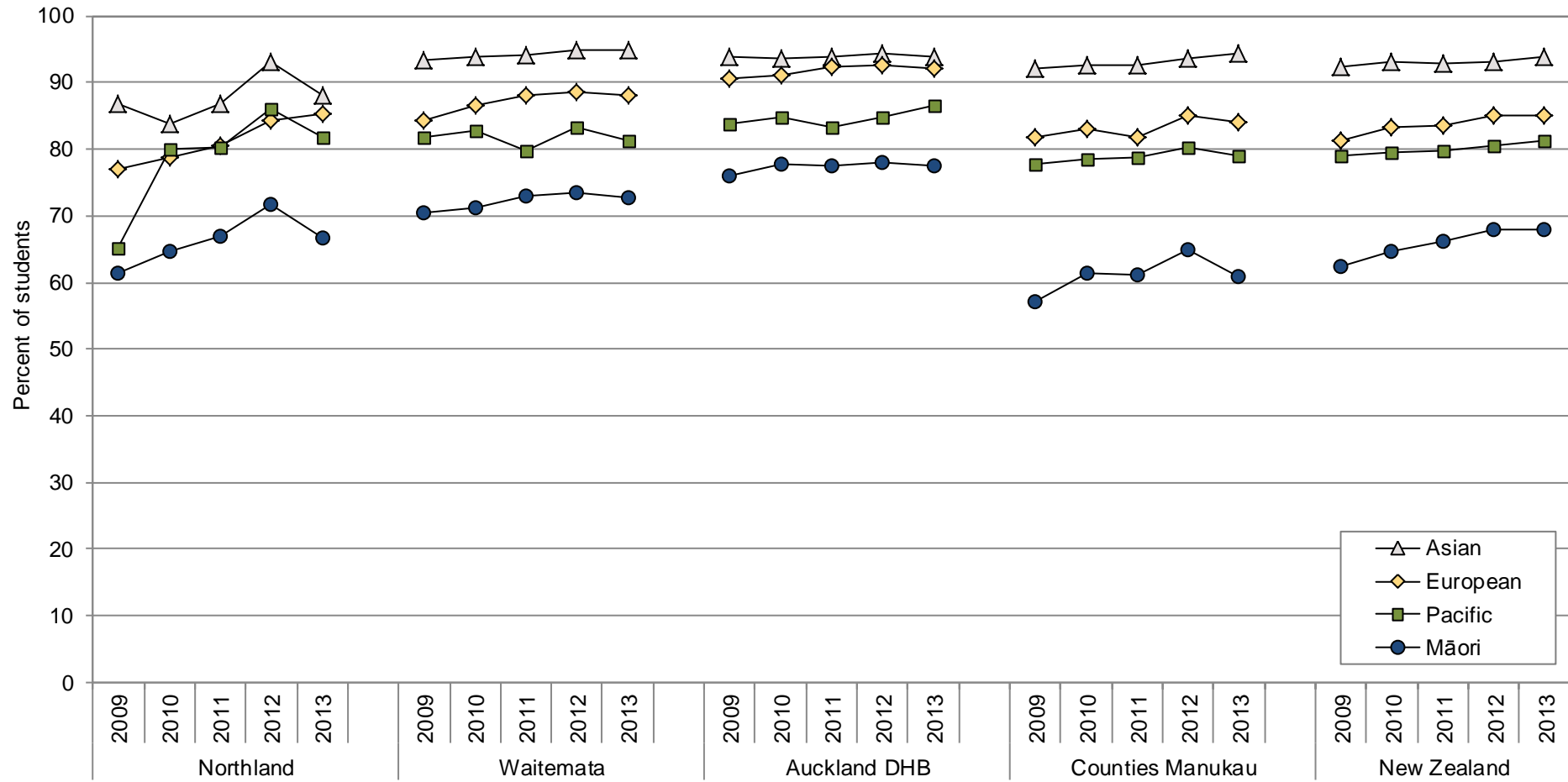
In the Waitemata, Auckland and Counties Manukau DHBs during 2009–2013, a higher proportion of Asian > European > Pacific > Māori students stayed on at school to 17 years of age, while in Northland retention rates to 17 years were higher for European than for Māori students (**Figure 78**).

Local Policy Documents and Evidence Based Reviews Relevant to Educational Participation in Young People

There is considerable interaction between and overlap among education-related indicators, and the tables in section provide links to local policy documents and evidence-based reviews that are also relevant to senior secondary school retention and tertiary participation. Please refer to **Table 22** (on page 118) for publications relevant to early childhood education; **Table 26** (on page 125) for initiatives to improve the educational participation and attainment of Māori students; **Table 28** (on page 148) for publications relevant to the prevention of stand-downs, suspensions, exclusions and expulsions, while **Table 29** (on page 156) reviews publications relevant to truancy and unjustified absences. Finally, **Table 27** (on page 132) reviews publications which consider strategies to improve student's educational attainment.



Figure 78. Percentage of secondary school students staying on at school to 17 years of age by ethnicity, Northern DHBs vs. New Zealand 2009–2013



Source: Ministry of Education ENROL; Note: Ethnicity is total response and thus individual students may appear in more than one ethnic group

SCHOOL STAND-DOWNS, SUSPENSIONS, EXCLUSIONS AND EXPULSIONS

Introduction

Stand-downs, suspensions, exclusions and expulsions are measures of the way that schools respond to a wide range of concerning behaviours, including drug and alcohol abuse and violence, which could disrupt the learning of the individuals concerned and be disruptive and unsafe for peers and adults in the school community. There is variability on the way that schools respond to behaviour: what one school may choose to suspend for, another may not. If used as an opportunity to reduce tension and reflect on the action which led to the stand-down, a stand-down can be a positive mechanism for preventing escalation as part of a proactive approach. However, excluded or expelled students may face difficulties in enrolling in other schools and as a consequence have to access correspondence schooling, Alternative Education provision (for excluded students) or tertiary education, or may drop out of the education system entirely [76].

While for the majority of students a stand-down or suspension is a one off event, with the time spent away from school being fairly limited (e.g. a few days or weeks), for some students the concerning behaviour is part of a persistent conduct problem. New Zealand and overseas research has found that conduct problems are associated with poorer long term outcomes, including educational underachievement (e.g. leaving school early and without qualifications), unemployment and occupational instability during young adulthood [77]. Improved student engagement is an important contributing factor in improving student achievement (see chapter on Highest Educational Attainment at School Leaving). Age-standardised stand-down rates have fallen in New Zealand for seven consecutive years, and in 2013 age-standardised stand-down, suspension, and exclusion rates were at their lowest in 14 years of recorded data, which may signal improved student engagement [76].

Proactive partnerships with parents and a strategy focused on both achievement and behaviour, rather than focused only on disciplinary or only on pastoral responses, are essential for positive outcomes in addressing concerning behaviours in the school setting [76]. Positive behaviour for learning programmes (PB4L) and other initiatives help parents, teachers and schools address problem behaviour, improve children's wellbeing and increase educational achievement from early childhood through to the end of secondary school. PB4L is a joint initiative between a number of education sector organisations with programmes and initiatives delivered by the Ministry of Education in partnership with non-governmental organisations, early childhood sector organisations and Resource Teachers: Learning and Behaviour [78].

The following section uses information from the Ministry of Education's Stand-down and Suspension database to review the proportion of students who were stood-down, suspended, excluded, or expelled from school during 2000–2013.

Data Source and Methods

Indicator

1. Number of stand-downs, suspensions, exclusions and expulsions per 1,000 students enrolled

Numerator: Total number of stand-downs, suspensions, exclusions and expulsions, per year of age

Denominator: Number of students on the school roll as at July 1st, per year of age

The following students were excluded from the analysis: Students from schools not receiving public funding; students at Correspondence School; adult students (older than 19); and International fee-paying students.

Data Source

Ministry of Education

<http://www.educationcounts.govt.nz/indicators/main/student-engagement-participation/Stand-downs-suspensions-exclusions-expulsions>



Definition

Information in this section is based on four Ministry of Education Student Participation Indicators which are defined as follows.

Stand-downs: A school principal may consider the formal removal of a student from school for a period of up to five school days. A stand-down can total no more than five school days in any term, or 10 days in a school year. Students return automatically to school following a stand-down.

Suspensions: A suspension is the formal removal of a student from school until the school's Board of Trustees decides the outcome at a suspension meeting. Following a suspension, the Board of Trustees decides how to address the student's misbehaviour. The Board can either lift the suspension (with or without conditions), extend the suspension (with conditions), or terminate the student's enrolment at the school.

Exclusions and Expulsions: If a student is under 16 years, the Board of Trustees may decide to exclude them from the school, with the requirement that they enrol elsewhere. This decision is arrived at only in the most serious cases. If the student is aged 16 or over, the Board may decide to expel them from the school, and the student may enrol at another school. Exclusions and expulsions may lead to difficulties being accepted into other schools and may result in students accessing correspondence schooling, entering alternative education or dropping out of the education system altogether.

Notes on Interpretation

Note 1: Data were obtained from the Ministry of Education's Stand-down and Suspension database, which was developed in 1999, after the introduction of the Education (Suspension) Rules 1999. Rates were calculated by dividing the number of stand-downs, suspensions, exclusions or expulsions per individual year of age during the school year by the number of students on the school roll at July 1st, per individual year of age. All figures were then age standardised by the Ministry of Education, so that all subgroups in all years had the same age structure. In this process, the expected number of stand-downs, suspensions, exclusions and expulsions were calculated by looking at the age-dependence of each outcome nationally over each year, and then applying this to the age structure and population of respective schools. The age-standardised rate for each DHB was calculated by multiplying the 2011 national rate by the ratio of observed to expected outcomes for each DHB. As such, the standardised rate is an artificial measure, but does provide an estimate of how groups might compare over time if they had the same age distribution [79].

Note 2: As a number of students were stood-down, suspended, excluded or expelled on more than one occasion, the number of individual students experiencing these outcomes may be less than the number of cases reported in these figures.

Note 3: Ethnicity is level 1 prioritised (i.e. one ethnic group per student)

New Zealand Distribution and Trends

New Zealand Trends

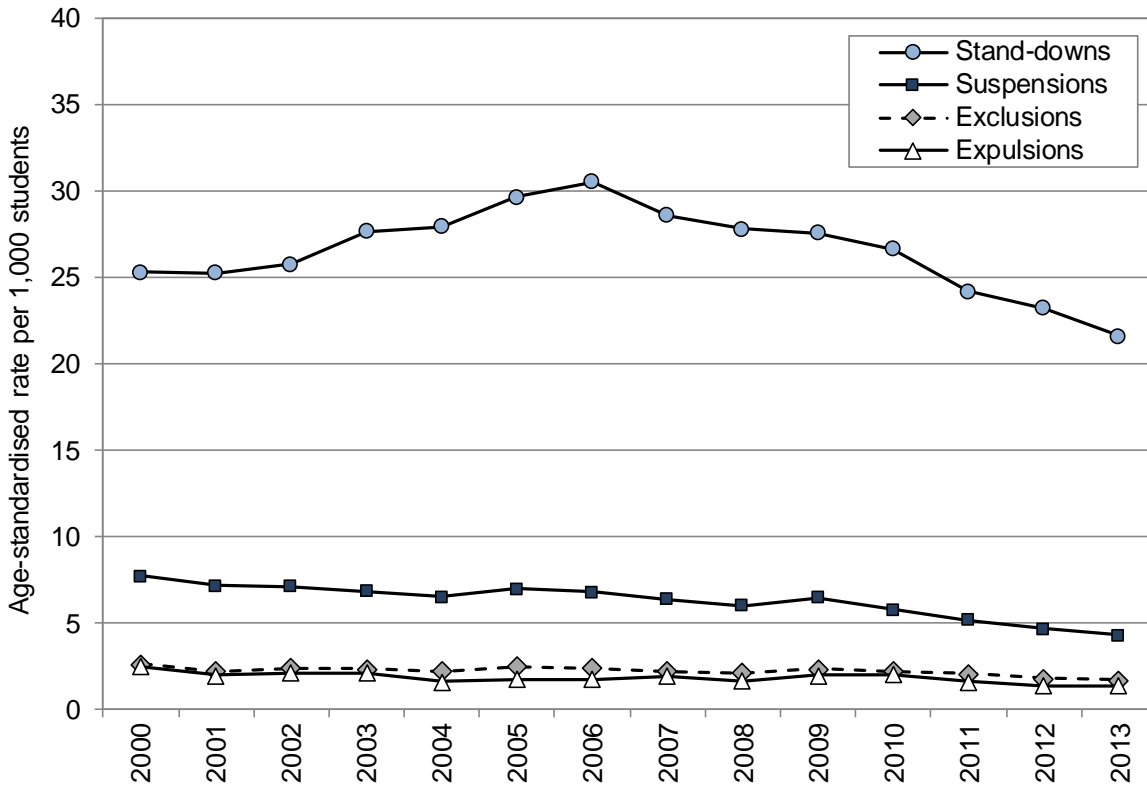
In New Zealand during 2000–2013, suspension rates gradually declined, while stand-down rates increased, reached a peak in 2006 and then declined. Exclusion and expulsion rates were more static. Throughout this period, the stand-down rate greatly exceeded suspensions, which in turn exceeded exclusions and expulsions (**Figure 79**).

Distribution of Stand-downs and Suspensions by Ethnicity

In New Zealand during 2000–2013, stand-down and suspension rates were higher for Māori > Pacific > European > Asian students. Stand-down rates for Māori, Pacific, and European students declined after 2006, with the largest declines in absolute terms being seen for Māori and Pacific students. Suspension rates also declined for all ethnic groups during 2000–2013, with the largest declines in absolute terms again being seen for Māori students (**Figure 80**).

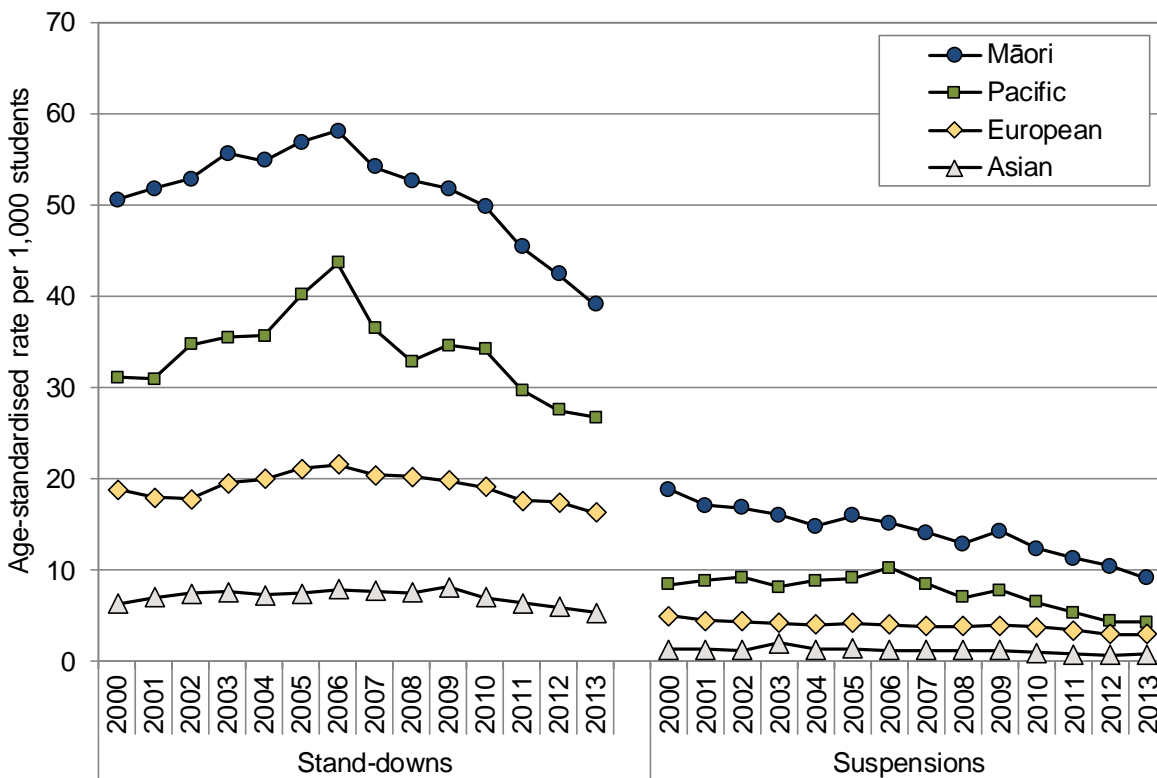


Figure 79. Age-standardised rates of stand-downs, suspensions, exclusions and expulsions, New Zealand 2000–2013



Source: Ministry of Education

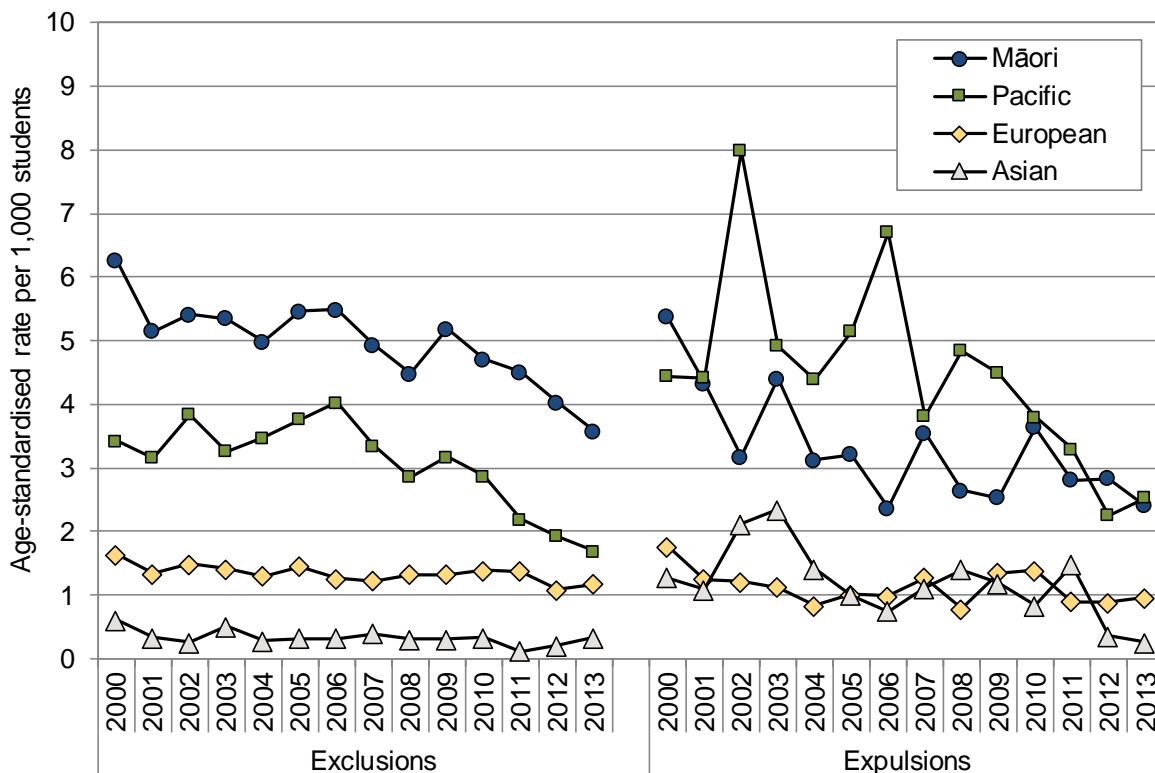
Figure 80. Age-standardised rates of stand-downs and suspensions by ethnicity, New Zealand 2000–2013



Source: Ministry of Education; Note: Ethnicity is level 1 prioritised



Figure 81. Age-standardised rates of exclusions and expulsions by ethnicity, New Zealand 2000–2013



Source: Ministry of Education; Note: Ethnicity is level 1 prioritised

Distribution of Exclusions and Expulsions by Ethnicity

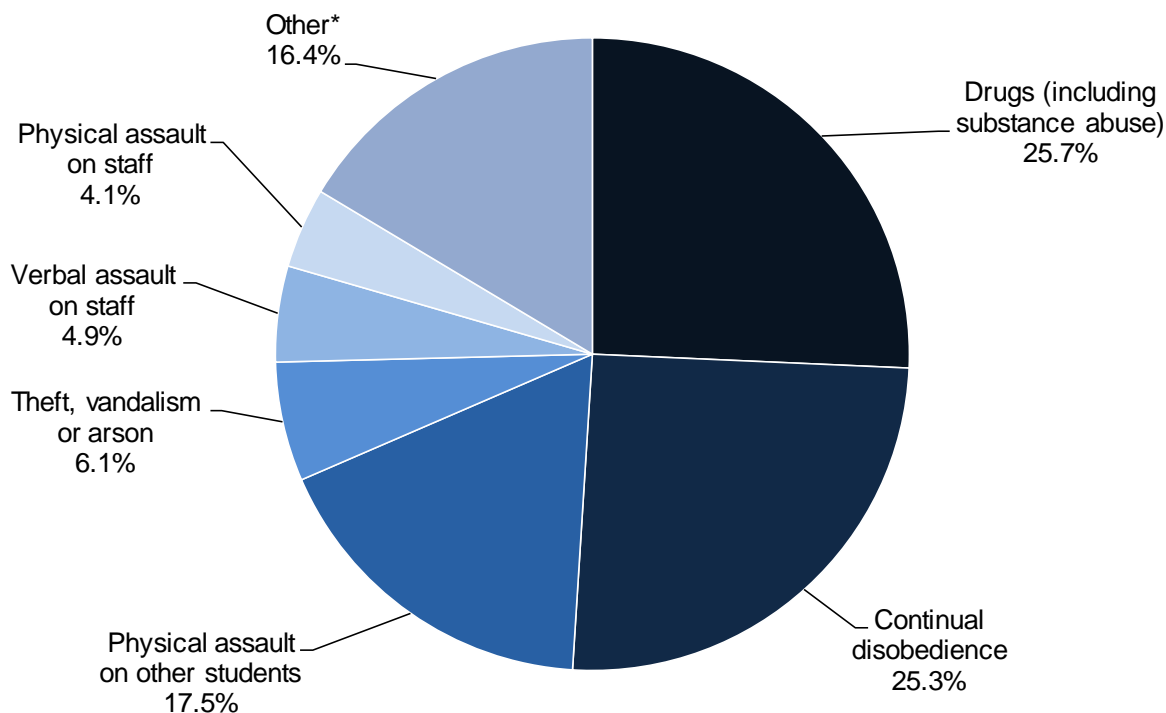
In New Zealand during 2000–2013, exclusion rates were higher for Māori > Pacific > European > Asian students, while expulsion rates were generally higher for Pacific > Māori > European and Asian students. Exclusion rates declined for Māori and Pacific students during this period, although exclusion and expulsion rates for European and Asian students were more static (**Figure 81**).

Suspensions by Behaviour

In New Zealand during 2013, the most common reasons for a suspension were the misuse of drugs or other substances (25.7%), continual disobedience (25.3%), or a physical assault on other students (17.5%), which together accounted for 68.5% of all suspensions. Verbal assaults on staff and theft also made a smaller contribution (**Figure 82**).



Figure 82. Distribution of suspensions by type of behaviour, New Zealand 2013



Source: Ministry of Education; Note: *Other includes weapons, vandalism, alcohol, verbal assault on other students, sexual misconduct and harassment, arson, smoking and other harmful or dangerous behaviours

Northern DHBs Distribution and Trends

Northern DHBs vs. New Zealand

In Northland during 2000–2013, stand-down rates were consistently higher than the New Zealand rate, while in the Auckland and Waitemata DHBs rates were consistently lower. Rates in Counties Manukau were similar to the New Zealand rate. Suspension rates in Northland were also higher than the New Zealand rate, while in the Waitemata, Auckland and Counties Manukau DHBs rates were similar to the New Zealand rate (**Figure 83**).

Large year to year variations in exclusion and expulsion rates, made DHB vs. New Zealand comparisons more difficult (**Figure 84**).

Distribution of Suspensions by Ethnicity

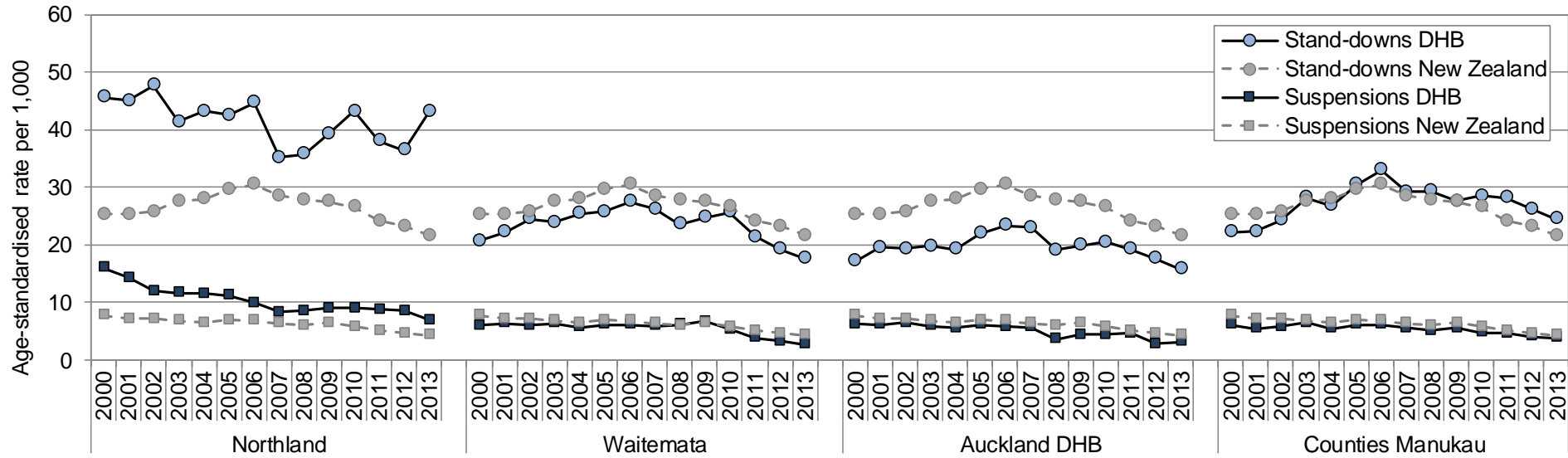
In the Waitemata, Auckland and Counties Manukau DHBs during 2000–2013, suspension rates were generally higher for Māori > Pacific > European > Asian students, while in Northland rates were higher for Māori than for European students (**Figure 85**).

Local Policy Documents and Evidence Based Reviews Relevant to Stand-downs, Suspensions, Exclusions and Expulsions

As the section above suggests, conduct problems can significantly impair a young person's engagement with the education system. **Table 28** (below) considers local policy documents relevant to the prevention of conduct problems in children and young people, as well as those which provide guidance to Boards of Trustees when considering suspending, standing down, excluding or expelling a student from school. Strategies to improve school attendance are considered in **Table 29** on page 156 in the Truancy and Unjustified Absences section.

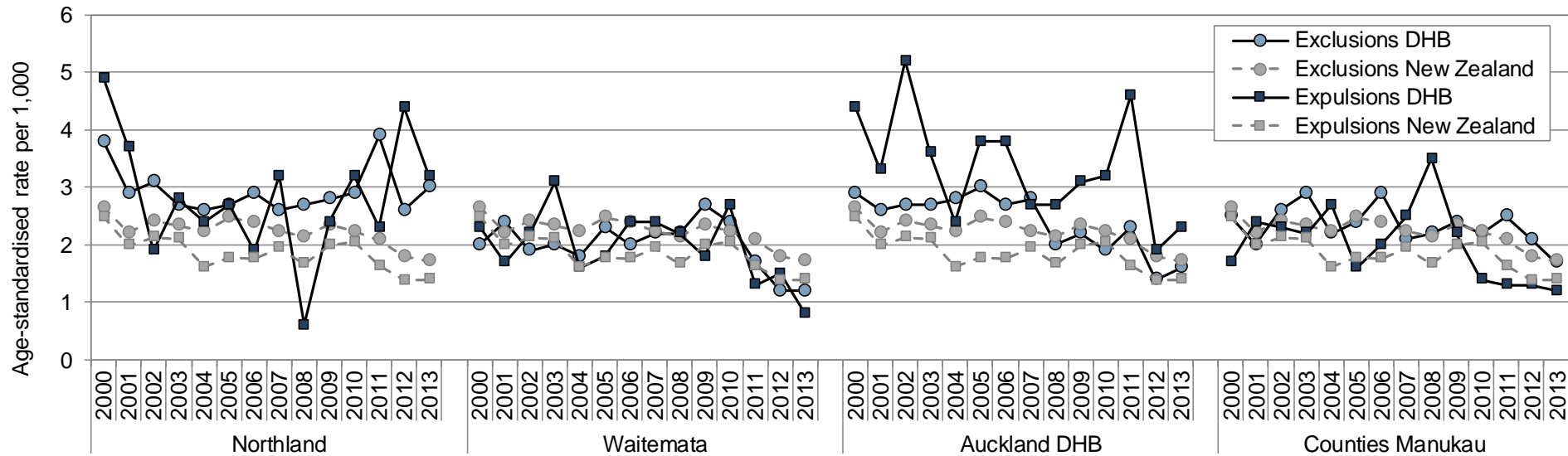


Figure 83. Age-standardised school stand-down and suspension rates, Northern DHBs vs. New Zealand 2000–2013



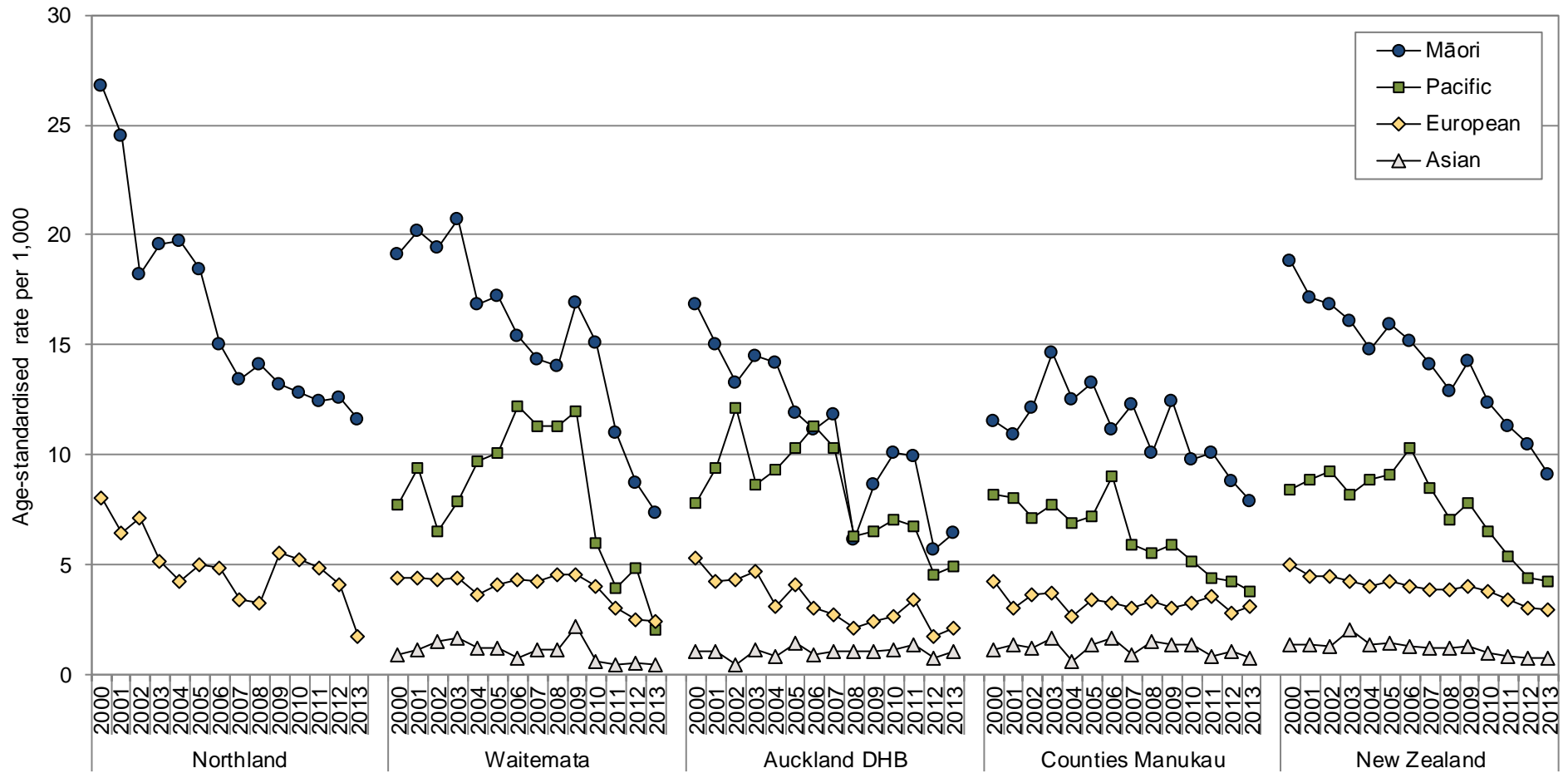
Source: Ministry of Education; Note: Age-standardised rate per 1,000 students

Figure 84. Age-standardised school exclusion and expulsion rates, Northern DHBs vs. New Zealand 2000–2013



Source: Ministry of Education; Note: Age-standardised rate per 1,000 students

Figure 85. Age-standardised school suspension rates by ethnicity, Northern DHBs vs. New Zealand 2000–2013



Source: Ministry of Education; Note: Ethnicity is Level 1 prioritised; Age-standardised rate per 1,000 students

Table 28. Local policy documents and evidence-based reviews relevant to stand-downs, suspensions, exclusions, and expulsions

Ministry of Education publications
<p>Ministry of Education. 2013. Positive behaviour for learning: Update 2013. Wellington: Ministry of Education. http://pb4l.tki.org.nz/</p> <p>This report places the positive behaviour for learning (PB4L) programmes in context and provides an indication of early outcomes. PB4L principles include an understanding that positive behaviour can be learnt and difficult and disruptive behaviour can be unlearned, and that individual children are not a 'problem'—we need to change the environment around them to support positive behaviour. The initiatives seek to implement effective evidence-based programmes and frameworks. Māori students are an important focus of PB4L in mainstream and in two Kaupapa Māori programmes. Early results of evaluation of schools that started PB4L School-Wide in 2010 show that stand-down rates decreased, and retention rates and NCEA Level 1 achievement rates improved significantly more than in comparison schools. Evaluation of the Incredible Years Parent programme showed clear evidence of positive behaviour change and improved family relationships for most participants that was sustained at 6-months follow-up. The report also includes individual case studies that illustrate the varied ways in which PB4L is implemented in different settings.</p>
Ministry of Social Development documents
<p>Advisory Group on Conduct Problems. 2013. Conduct Problems Adolescent Report. Wellington: Ministry of Social Development. http://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/research/conduct-problems-best-practice/adolescent-report-2013.pdf</p> <p>This is the fourth report in a series on the prevention, treatment and management of conduct problems in young people. This report has a focus on ages 13–17; previous reports covered ages 3–7 and 8–12. The advisory group distinguishes between adolescent limited and life course persistent conduct problems, and uses the He Awa Whiria (braided rivers) model to reconcile prevention science and Kaupapa Māori perspectives on conduct problems. A systematic literature review underpins a summary of interventions for the treatment and management of adolescent conduct problems and identification of four recommended and seven promising interventions. The report notes the importance of recognising comorbid conditions that commonly occur in combination with conduct problems. Interagency collaboration and the development of multi-disciplinary teams of clinicians, educational experts, social workers and representatives of the criminal justice system are key reforms required for effective assessment, treatment and management of adolescent conduct disorders. The 32 recommendations from the advisory group include specific instances where government agencies can work together to ensure greater consistency in the assessment of conduct problems and their comorbidities, use of evidence based interventions, robust evaluation of programmes and interventions, and development of culturally appropriate and culturally responsive programmes.</p>
<p>Advisory Group on Conduct Problems. 2009. Conduct Problems: Best Practice Report. Wellington. Ministry of Social Development. http://www.msd.govt.nz/about-msd-and-our-work/publications-resources/research/conduct-problems-best-practice/index.html</p> <p>This report explores the issues relating to conduct problems and their treatment. It is presented in four parts.</p> <p>Part 1 introduces the report and addresses Treaty of Waitangi considerations, classifications and terminology, why it is important to address conduct problems, when to intervene, co-occurring conditions, and the policy implications.</p> <p>Part 2 provides a review of evidence on effective interventions, including the importance of RCTs for identifying effective programmes, the prevention of childhood conduct problems, the treatment and management of conduct problems in children and young people (including interventions for 3–12 year-olds and for adolescents and young adults), the role of medication and other treatment modalities, and makes policy recommendations.</p> <p>Part 3 examines the issues that need to be addressed in translating evidence into effective policy, the role of population screening, factors contributing to implementation fidelity and programme effectiveness, the management of comorbid or associated childhood and adolescent problems, and the science of prevention and policy development.</p> <p>Part 4 comprises a series of sections prepared by expert Māori, Pacific and Asian authors, with a view to ensuring the voices of different ethnic groups are included in the report.</p>
New Zealand guidelines
<p>Ministry of Education. 2009. Guidelines for principals and boards of trustees on stand-downs, suspensions, exclusions and expulsions. Part I Legal options and duties. Wellington: Ministry of Education. http://www.minedu.govt.nz/NZEducation/EducationPolicies/Schools/StanddownsSuspensionsExclusionsExpulsions.aspx</p> <p>These guidelines are designed to assist boards of trustees, principals, and teachers with their legal options and duties and meet their obligations under relevant statutory requirements and are for use in all state and state-integrated schools. These guidelines provide information about legal options and duties in relation to stand-downs, suspensions, exclusions and expulsions, as well as good practice advice on ways to manage behaviour that could possibly lead to such action.</p>

International guidelines

National Institute for Health and Care Excellence. 2014. **Antisocial behaviour and conduct disorders in children and young people**. NICE quality standard 59 <http://www.nice.org.uk/guidance/qs59>

Conduct disorders, and associated antisocial behaviour, are the most common mental and behavioural problems identified in children and young people. This quality standard (QS) covers the recognition and management of antisocial behaviour and conduct disorders in children and young people (aged under 18 years).

The prevalence of conduct disorders increases throughout childhood and they are more common in boys than girls. There is a 3- to 4-fold increase in prevalence among children from more deprived households compared with those from the most affluent. Almost 40% of looked-after children, those who have been abused and those on child protection and safeguarding registers have been identified as having a conduct disorder.

Selective prevention and early intervention can help to reduce the likelihood of a child with a conduct disorder developing more complex behavioural problems. A person-centred, integrated approach to providing services is fundamental to delivering high-quality care to children and young people with a conduct disorder. It is important that agencies work collaboratively so that cases of conduct disorders can be identified early and that they refer appropriately in order for early intervention to occur. The QS also highlights that coexisting conditions, for example, attention deficit hyperactivity disorder (ADHD) and post-traumatic stress disorder (PTSD), are common in children and young people with a conduct disorder, and it is important that agencies take account of this when working in collaboration with other services.

National Institute for Health and Care Excellence. 2013. **Antisocial behaviour and conduct disorders in children and young people: recognition, intervention and management**. London: National Institute for Health and Care Excellence. <http://www.nice.org.uk/guidance/cg158>

The UK Office of National Statistics (ONS) surveys of 1999 and 2004 reported that the prevalence of conduct disorders increases throughout childhood and that these disorders are more common in boys than girls: 7% of boys and 3% of girls aged 5 to 10 years have conduct disorders; in children aged 11 to 16 years the proportion rises to 8% of boys and 5% of girls. Conduct disorders commonly coexist with other mental health problems: 46% of boys and 36% of girls have at least 1 coexisting mental health problem.

A diagnosis of a conduct disorder is strongly associated with poor educational performance, social isolation and substance misuse, and increased contact with the criminal justice system for adolescents. This association continues into adult life with poorer educational and occupational outcomes, involvement with the criminal justice system (as high as 50% in some groups) and a high level of mental health problems

Several interventions have been developed for children with conduct disorder and related problems, such as parenting programmes typically focused on younger children, and multisystemic approaches usually focused on older children. Key components of this clinical guideline are comprehensive assessment including recognition of co-existing health or educational issues, identification of effective treatment and care options, and psychosocial interventions with the child, parents and caregivers. Pharmacological interventions should not be offered for the routine management of behavioural problems in children and young people with conduct disorders. Appropriate organisation and delivery of care with collaboration between health and social care professionals and their colleagues in educational settings is essential to promote access to services for children and young people with a conduct disorder and their parents and carers. Important areas for research are also identified.

Evidence-based medicine reviews

Petrosino A, et al. 2009. **"Scared Straight" and other juvenile awareness programs for preventing juvenile delinquency**. Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD002796 <http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD002796/frame.html>

There are regular calls for interventions that show young people at risk of exhibiting socially undesirable behaviour the consequences of their antisocial behaviour and delinquency by, for example, visiting prisons. Nine trials, all conducted in the USA, were identified as eligible for this systematic review which covered juvenile and young adults (aged 14–20 years). These studies had to have a no-treatment arm to their study and measure at least one criminal behaviour outcome 'post-visit'. Analysis indicated that the intervention did more harm than doing nothing, regardless of whether the analysis was based on a fixed or random effect model. In conclusion therefore, organising visits to prison facilities by young delinquents is ineffective at best, and appears more likely to lead to more offending behaviour. The authors note that despite the consistently negative consequences of the intervention, the programmes have been continued, although the evaluations of them have been stopped.

Eyberg SM, et al. 2008. **Evidence-Based Psychosocial Treatments for Children and Adolescents with Disruptive Behavior**, Journal of Clinical Child & Adolescent Psychology, 37:1, 215–237
<http://dx.doi.org/10.1080/15374410701820117>

Twenty eight studies (from 1996–2007) that presented evidence-based psychosocial treatment (EBTs) for child and adolescent disruptive behaviour were examined in this review. Included were 16 EBTs and 9 ‘possibly efficacious’ treatments (treatments that are potentially worth implementing but do not have the same level of evidence as the EBTs). Medication treatments were not included nor interventions for behaviours associated with autism or ADHD, or isolated problems such as fire lighting or truancy, all of which have their own literature. Individual child, parent, and family and group treatments were eligible. The EBTs included multiple modalities: anger control management, group assertive training, helping the non-compliant child, Webster-Stratton et al.’s Incredible Years interventions, multidimensional treatment foster care, multisystemic therapy, parent-child interactive therapy, parent management training Oregon model, different levels of Positive Parenting Program (Triple P), problem solving skills training and a rational-emotive mental health program. Combinations of treatment components were included where these had been appropriately evaluated. In conclusion, the review indicated that a range of treatments can be efficacious for particular children with disruptive behaviour disorders. It also noted a variety of direct treatment providers being used in the EBTs, including teachers, foster parents, and peers, as well as mental health professionals.

Other Relevant Publications

Education Review Office. 2014. **Towards equitable outcomes in secondary schools: Good practice**. Wellington: Education Review Office. <http://www.ero.govt.nz/index.php/National-Reports/Towards-equitable-outcomes-in-secondary-schools-Good-practice-May-2014/National-Report-Summary-Towards-equitable-outcomes-in-secondary-schools-Good-practice>

This report focuses entirely on examples of good practice, highlighting seven secondary schools in areas of relative socio-economic disadvantage with good levels of student engagement and achievement. The report includes case studies of each of the seven schools which included single sex schools, an integrated school, and urban and provincial schools with ethnically diverse rolls ranging from 400 to 2200 students. Although every school was different with its own contexts, features and practices, all of the schools were effectively keeping students at school and engaged in learning. The common aspects of good practice were identified as effective leadership, strong parent and community engagement, effective use and analysis of data, self-review, and programmes tailored to meet the needs of individual students. Nine comparison secondary schools at a similar socioeconomic decile rating had excluded or expelled over eight times as many students as the schools ERO selected for this sample. Leaders, teachers and trustees explored alternatives to punitive responses to undesirable behaviour, such that ceasing the student’s education at their school was rarely seen as an option for dealing with behavioural issues. A board chairman from one of the secondary schools in the sample said ‘With any exclusion, we try to make it a comma, not a full stop.’

Websites

Ministry of Education. 2014. **Positive behaviour for learning**.
<http://www.minedu.govt.nz/theministry/educationinitiatives/positivebehaviourforlearning.aspx> accessed 17 November 2014

Positive Behaviour for Learning is a long-term, systemic approach involving several initiatives to help parents, whānau, teachers, early childhood centres and schools address problem behaviour, improve children’s wellbeing and increase educational achievement. There are links to the initiatives on this website.

Note: the publications listed were identified using the search methodology outlined in **Appendix 1**

TRUANCY AND UNJUSTIFIED ABSENCES

Introduction

Student attendance, along with effective teaching, has an important positive impact on student engagement and achievement with student attendance being one of the most significant variables influencing educational achievement in senior secondary school [80]. All students must be present at school so they can participate and engage in learning [81]. In New Zealand, parents must legally make sure that their child goes to school each day and parents and carers of children between six and 16 years old can be prosecuted if their child is away from school without a good reason [82].

Irregular attendance may be an early indicator of problems with student motivation or teaching effectiveness. Students who are truant or, more precisely, are unjustifiably absent from class have an increased risk of alienation from the education system [80]. Students with high absenteeism are less likely to succeed in their learning. If a student misses five school days each term, or one day a fortnight, they will miss the equivalent of one year of school over 10 years. As the level of absenteeism grows, the difficulty of re-engaging in learning can grow exponentially [81]. Longitudinal studies in Dunedin and Christchurch also suggest that truancy is a strong predictor of substance abuse, suicidal risk, unemployment, early parenting and violence in later life [77] [83].

Interventions to reduce unauthorised absence can be enhanced by increasing the focus on primary school absence and parental attitudes, integration of attendance issues into wider, positive communications with pupils, parents and carers, effective systems to monitor attendance, and adapting curricula to better match pupils' aptitudes and aspirations [84].

The following section uses data from the Ministry of Education's School Attendance Survey to explore truancy and unjustified absences in New Zealand secondary school students.

Data Source and Methods

Indicators

1. Total unjustified absence rate

Numerator: Number of unjustified absences and intermittent unjustified absences per week

Denominator: Total number of enrolled students in participating schools

2. Frequent truancy rate

Numerator: Number of students with three or more unjustified absences during the survey week

Denominator: Total number of enrolled students in participating schools

The rates were calculated by dividing the number of absences by the total rolls of participating schools, which is then expressed as an average (mean) daily absence for the week per 100 students.

Data Source

Ministry of Education student attendance surveys (2011, 2012, and 2013)

Definitions

Absences were classified using the following definitions.

Justified absences: absences recorded in the register, and marked as having being satisfactorily explained. As the school principal has to make a judgement as to which explanations they will accept, the balance of justified and unjustified absences may vary slightly from school to school.

Unjustified absences: absences which are not explained, or not explained to the satisfaction of the school. For schools with an electronic Attendance Register (eAR), students who attended less than 120 minutes of their classes and had at least one unjustified absence were counted as an unjustified absence.

Intermittent unjustified absences: where a student is absent for part of a morning (or afternoon) or part of a period without justification (e.g. arriving 15 minutes late to school without a reason, or with a reason that is not acceptable to the principal). For schools with eAR data, students who attended classes for more than 120 minutes and had two or more unjustified absences were counted as an intermittent unjustified absence.

Total unjustified absences: the sum of unjustified and intermittent unjustified absences.



Frequent truants: where a student had three or more unjustified absences during the survey week.

Absence data were collected for each student for each day of the week. The rate for each absence type was calculated based on the total school rolls for the participating schools then related to an average (mean) daily absence for the week per 100 students. It should be noted that the rate did not indicate whether it was the same students that were absent, or whether different students were involved each day.

Notes on Interpretation

Note 1: The 2013 Ministry of Education Attendance Survey gathered data on student attendance during the week of 11–15 June 2012. Of the 2,448 schools invited to participate, completed returns were received from 1,950 schools: a response rate of 80%. The responding schools had approximately 611,500 students on their rolls, equating to 84% of the student population in all state and state integrated schools on 1 July 2013.

Note 2: Since 2009, the survey has utilised two forms of data collection. Schools that use a module in their Student Management Systems (SMS) to enter their attendance records electronically were asked to provide an extract from the eAR. Schools that do not use eAR were invited to take part in the paper version of the survey.

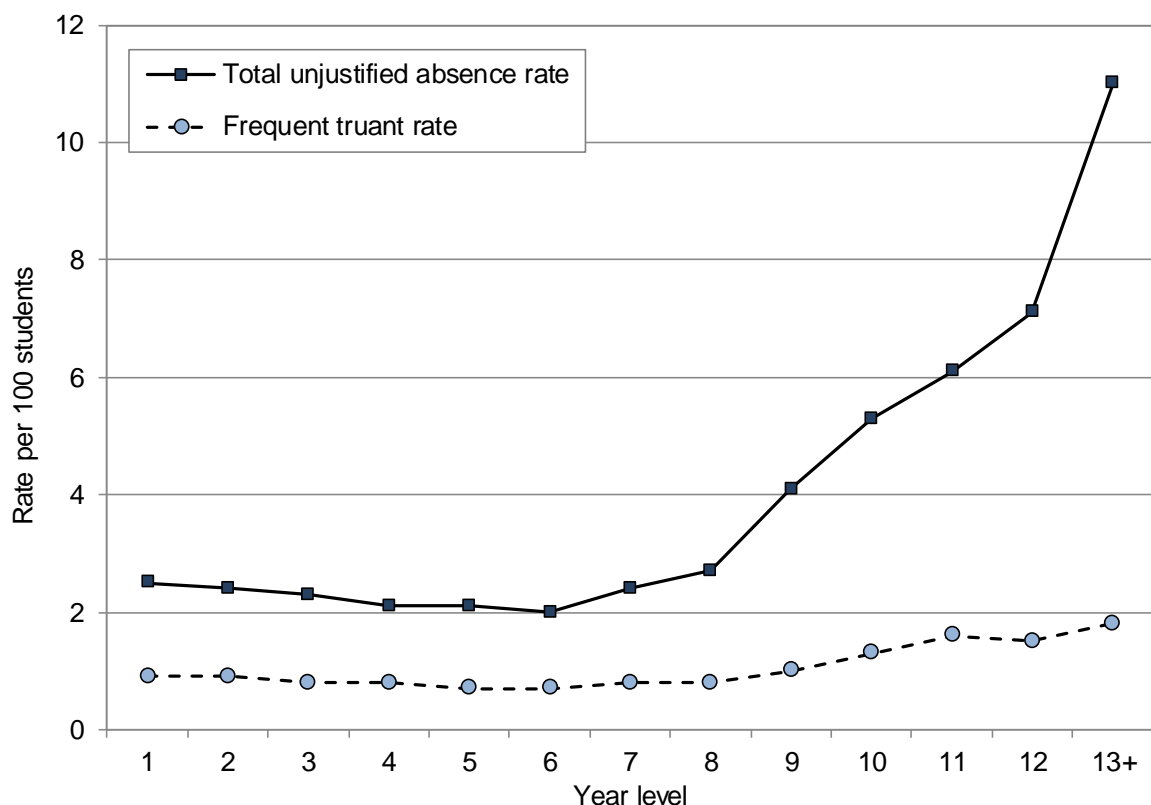
For further detail in available at <http://www.educationcounts.govt.nz/publications/series/2503/attendance-in-new-zealand-schools-in-2013>

New Zealand Distribution

Distribution by Year of Schooling

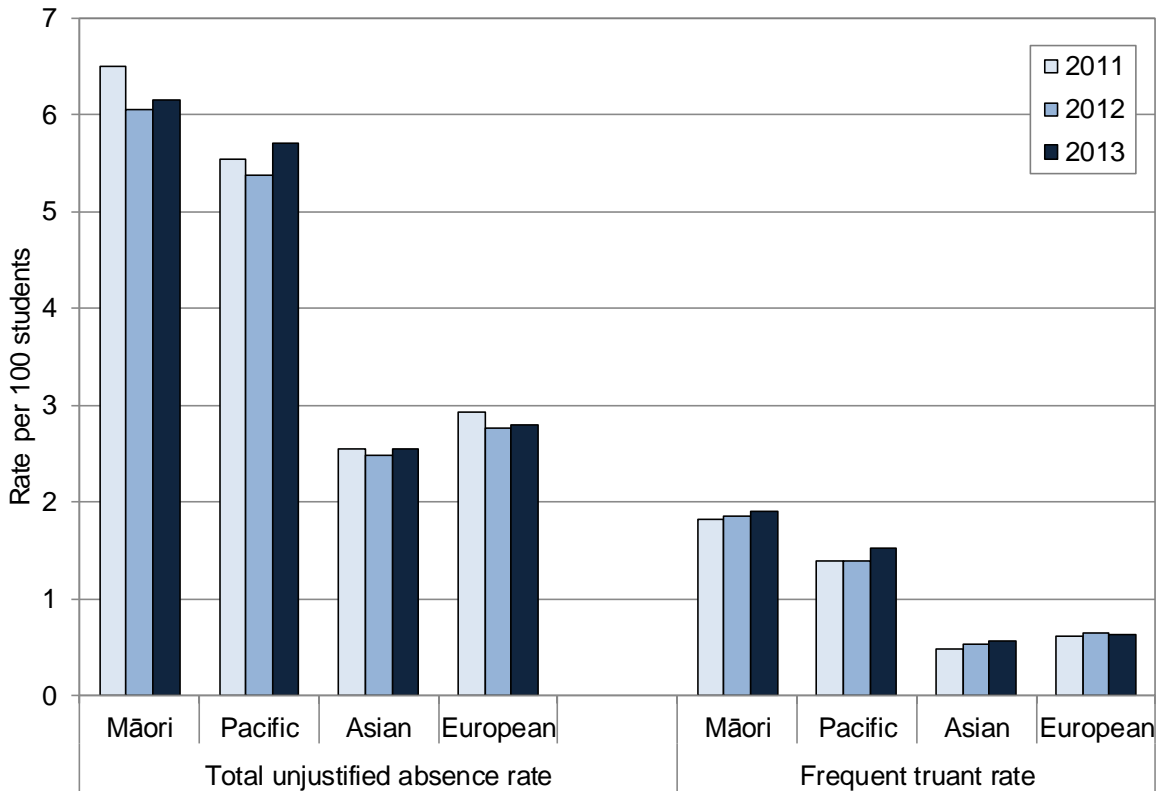
In New Zealand during 2013, total unjustified absences were relatively infrequent during the primary school years (Years 1–6), but increased progressively during secondary school (Years 9–13), with the highest rates being seen in those in Year 13+. While frequent truancy rates also increased during the secondary school years, the rate of increase was less marked than for total unjustified absences (**Figure 86**).

Figure 86. Total unjustified absences and frequent truancy by year level, New Zealand Ministry of Education attendance survey 2013



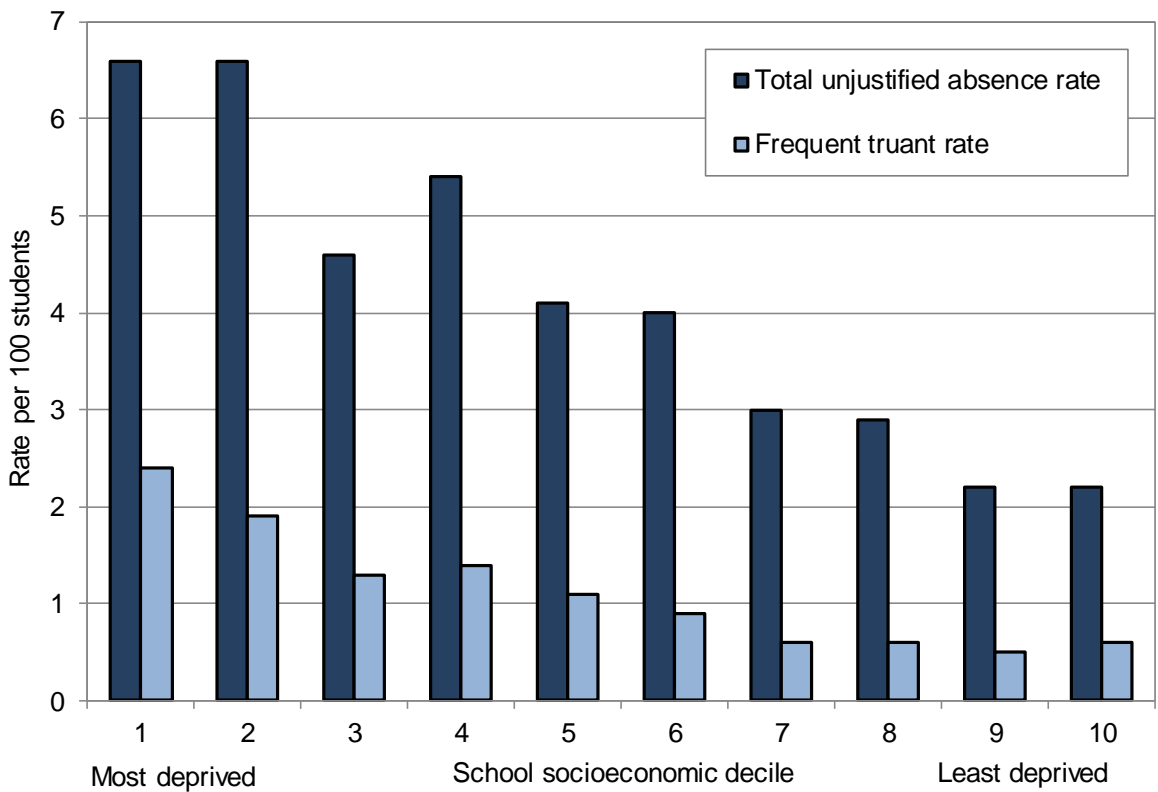
Source: Ministry of Education 2013 attendance survey; Note: Year 13+ includes students in Years 13–15

Figure 87. Total unjustified absences and frequent truancy by ethnicity, New Zealand 2011–2013



Source: Ministry of Education attendance surveys. Note: Ethnicity is prioritized

Figure 88. Total unjustified absences and frequent truancy by ethnicity and school socioeconomic decile, New Zealand 2013



Source: Ministry of Education 2013 attendance survey



Distribution by Ethnicity

In New Zealand during each of the years surveyed (2011, 2012, and 2013), total unjustified absences and frequent truancy were higher for Māori and Pacific students than for European and Asian students. Total unjustified absences were lower in 2013 than they were in 2011 for Māori, and European students, while rates increased for Pacific students and were similar for Asian students. Frequent truancy rates were higher in 2013 than in 2011 for Māori, Pacific, and Asian students, although rates for European students were similar during the two periods (**Figure 87**).

Distribution by School Socioeconomic Decile

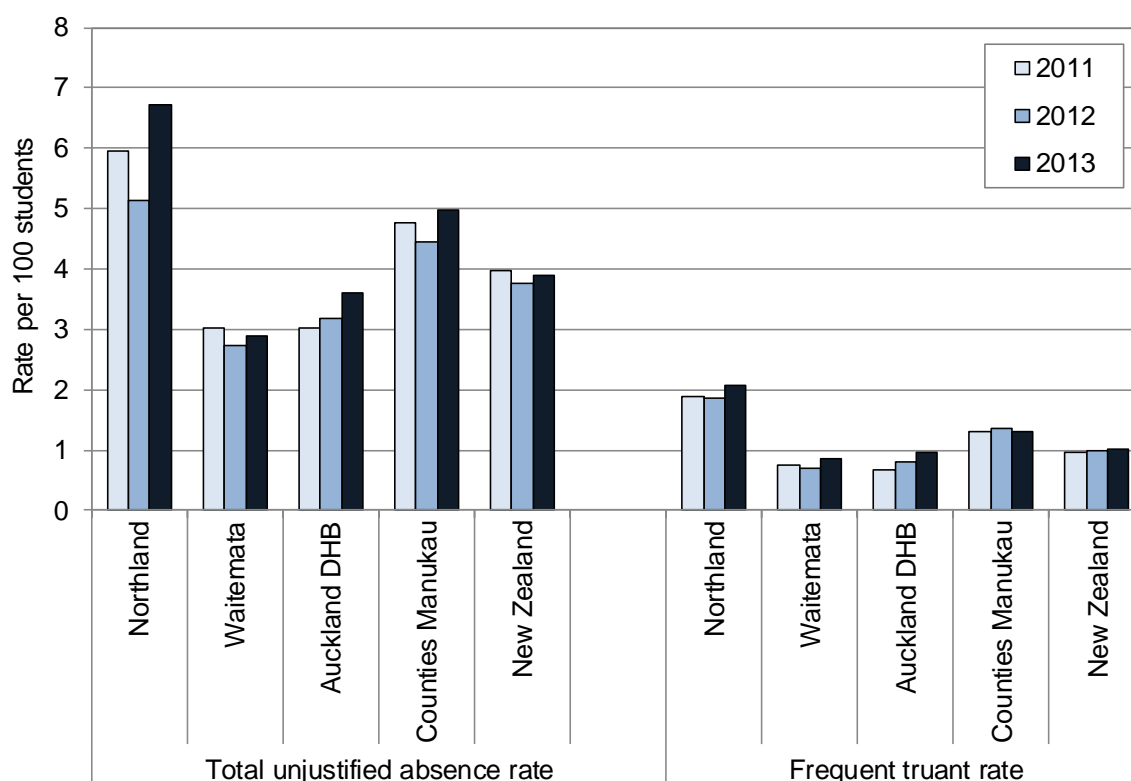
In New Zealand during 2013, total unjustified absences and frequent truancy decreased as the degree of deprivation of the school catchment decreased, with the lowest rates for both outcomes being seen in those in the least deprived areas (deciles 9–10) (**Figure 88**).

Northern DHBs Distribution and Trends

Northern DHBs vs. New Zealand

During 2011–2013, total unjustified absences and frequent truancy were higher in Northland, followed by Counties Manukau, than in the Auckland or Waitemata DHBs (**Figure 89**).

Figure 89. Total unjustified absences and frequent truancy, Northern DHBs vs. New Zealand 2011–2013

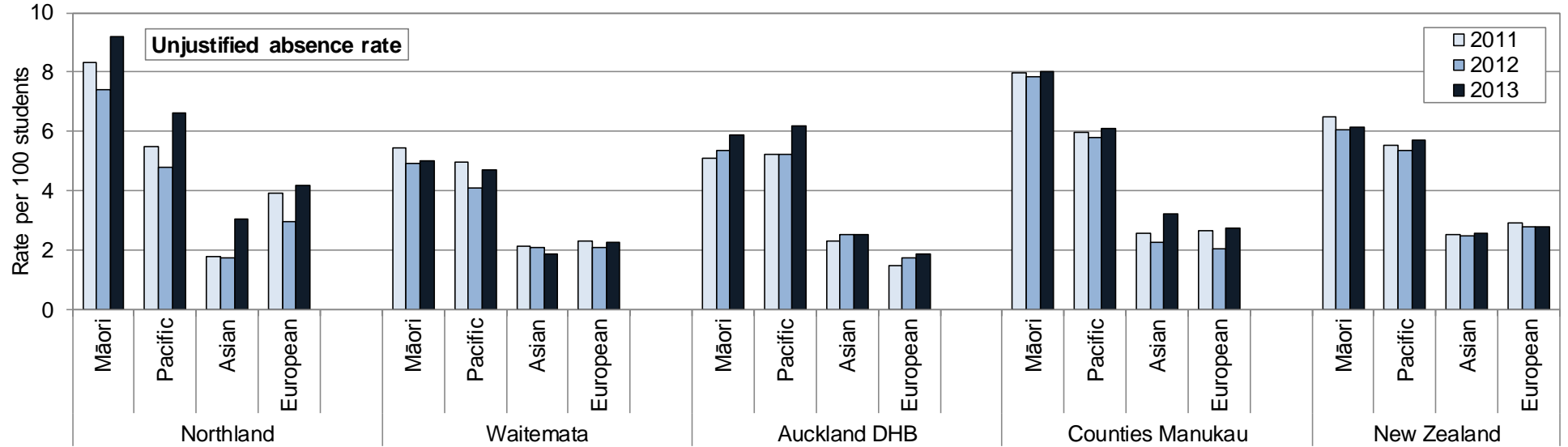


Source: Ministry of Education attendance surveys

Distribution by Ethnicity

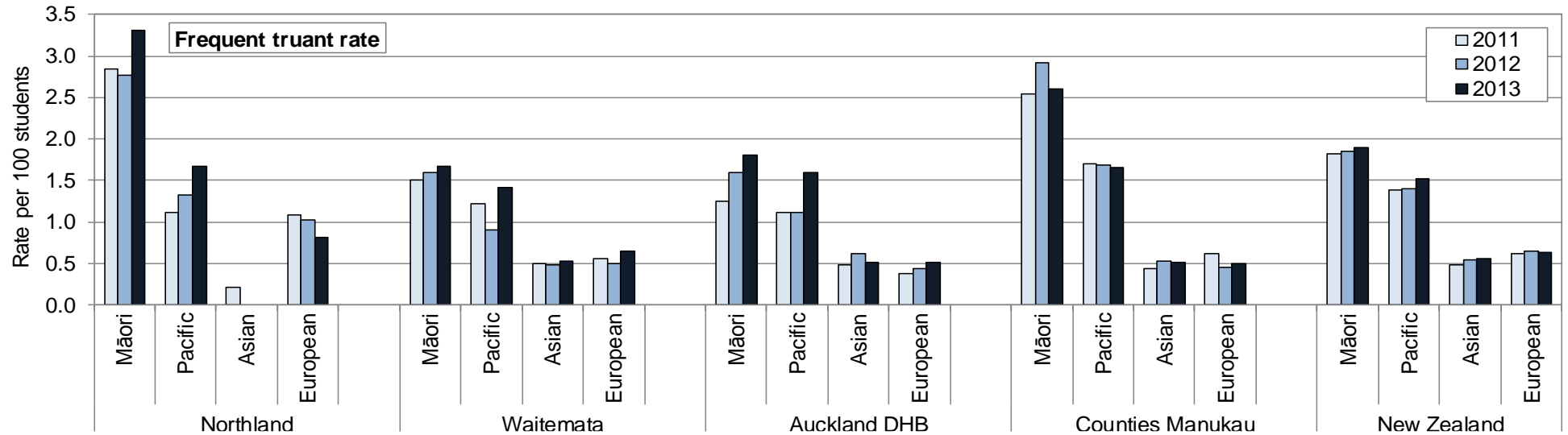
During 2011–2013, total unjustified absences and frequent truancy in all four Northern DHBs were higher for Māori and Pacific students than for European and Asian students (**Figure 90**, **Figure 91**).

Figure 90. Total unjustified absences by ethnicity, Northern DHBs vs. New Zealand 2011–2013



Source: Ministry of Education attendance surveys

Figure 91. Frequent truancy by ethnicity, Northern DHBs vs. New Zealand 2011–2013



Source: Ministry of Education attendance surveys

Local Policy Documents and Evidence-based Reviews which Consider Interventions to Improve School Attendance

Table 29 (below) provides additional local policy documents and evidence-based reviews specific to interventions to improve school attendance. There is considerable interaction between and overlap among education-related indicators, and this information should therefore be read alongside the other tables in this section: Early childhood education (**Table 22** on page 118); Māori-medium education (**Table 26** on page 125); Highest educational attainment (**Table 27** on page 132); and stand-downs, suspensions exclusions and expulsions (**Table 28** on page 148).

Table 29. Policy documents relevant to the improvement of school attendance

Ministry of Education publications
<p>Ministry of Education. 2011. Attendance matters: Guidelines for implementing an effective attendance management plan. Wellington: Ministry of Education. http://www.minedu.govt.nz/NZEducation/EducationPolicies/Schools/Attendance/ForBoardsAndPrincipals/~/_/media/MinEdu/Files/EducationSectors/PrimarySecondary/Attendance/AttendanceMatters.pdf</p> <p>These guidelines for boards of trustees, principals and teachers will help schools to focus on student attendance as a foundation for student engagement and achievement, develop and implement robust attendance management plans and effective processes and improve student attendance. The guidelines apply to all schools, even those with high levels of attendance, and especially schools with high absence rates. The guidelines include examples of effective attendance management strategies, templates and checklists to help schools undertake self-review, develop and evaluate an individually tailored attendance management plan. Relevant legislation and regulations are included in an appendix.</p>
Ministry of Social Development documents
<p>Centre for Social Research and Evaluation. 2013. Final Evaluation Report: Social Sector Trials Trialling New Approaches to Social Sector Change. Wellington: Ministry of Social Development. http://www.msd.govt.nz/documents/about-msd-and-our-work/work-programmes/initiatives/social-sector-trials/msd-social-sector-trials-evaluation-report-may-2013.pdf</p> <p>Reducing truancy was one of the high-level outcomes of the first Social Sector Trials (the Trials) implemented in March 2011 in six communities throughout Aotearoa New Zealand with a focus on 12–18 year old children. The Trials are a partnership between the Ministries of Social Development, Justice, Health, Education and the NZ Police and were set up to test a new approach to improving service delivery by reorganising funding and decision making processes across the social sector, and shifting control to local levels. This final evaluation outlines key findings from March 2011–February 2013. There are promising, although not verified, figures at the individual and population levels that truancy has reduced in some Trials locations. The common approach to reducing truancy in Trials locations was to work closely with schools, including primary schools as truancy is often perceived to start early. The Tokoroa campaign “It’s not okay to miss a day” Truancy Awareness Week was both highly targeted (inviting 35 families of truant children to the Community Education Expo where they were linked into support services) and aimed at the wider community (encouraging local businesses to adopt a truancy free zone). Tokoroa reported anecdotal evidence of individual successes (“one 14 year old student has gone from [zero] per cent attendance at the start of the process in 2011, to 54 per cent at the beginning 2012 [to] 71 per cent reported in June 2012”). Gore monitored their success in relation to school attendance using population level data. They reported a reduction in truancy rates following implementation of the Trials: unjustified absences dropped from 12% down to four per cent and intermittent unjustified absences dropped from 10.1 per cent to 3.1 per cent. These data came from monthly reports and have not yet been independently verified.</p>

Other relevant publications

Taylor C. 2012. **Improving attendance at school**. London: Department for Education.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/180772/DFE-00036-2012_improving_attendance_at_school.pdf

This report from the UK Government's expert adviser on behaviour summarises UK attendance data in 2009/2010 and highlights some of the issues. One interesting observation is that improving attendance by one percentage point in an 'average sized secondary school' will mean an additional 1,300 pupil-days in school. Patterns of non-attendance are often developed in primary school, and one of the recommendations is for primary schools to identify students who are developing a pattern of absence. The Adviser observed the following characteristics in three schools in socio-economically deprived areas that have attendance rates above the national average and very low persistent absence levels: determination to improve and sustain attendance rates, looking out for patterns of poor attendance in the earliest years and addressing them, supporting parents with walking buses, home visits or transport provision if required, refusal of parental requests for holidays unless there are exceptional circumstances. His recommendation to focus on improving attendance in primary school is justified thus: "where patterns of irregular attendance are picked up in nursery and reception, parents will be supported to get their children into school. Children with the worst attendance in the early years tend to come from the lowest socio-economic groups where attainment on entry to primary schools is often already notably lower than that of their peers. By ensuring that the parents of these children get into good attendance habits, schools will be able to do the work required to narrow this gap...Children will feel more included in the life of their school and will experience academic and social success. This will mean fewer children become disillusioned with education and they will be less inclined to misbehave or to truant when they are older."

National Audit Office. 2005. **Improving School Attendance in England**. London: National Audit Office.
<http://www.nao.org.uk/report/improving-school-attendance-in-england/>

The Department for Education and Skills has overall responsibility for school attendance in England and also sets national policy and funds local authorities and schools. Reducing total absence and unauthorised absence from school are among the Department's highest priorities. This report examines attendance in state schools in England for children of compulsory school age. It examines the factors associated with absence from school, and considers whether initiatives undertaken by the Department, local authorities and schools to reduce absence have been successful. In order to achieve this aim, the authors carried out statistical analysis of school absence in 2002–03, visited 17 schools, and through surveys and discussions obtained the views of head teachers, local authority staff, school inspectors and policymakers.

Websites

Ministry of Education. 2014. **Attendance services**.
<http://www.minedu.govt.nz/NZEducation/EducationPolicies/Schools/Attendance/ForBoardsAndPrincipals/AttendanceServices.aspx> accessed 14 November 2014

Ministry of Education. 2013. **Attendance**.
<http://www.minedu.govt.nz/Parents/AllAges/EducationInNZ/SchoolsInNewZealand/SchoolAttendance.aspx> accessed 14 November 2014

Note: The publications listed were identified using the search methodology outlined in **Appendix 1**

RISK AND PROTECTIVE FACTORS



IN-DEPTH TOPIC: BETTER HEALTH FOR THE NEW GENERATION: GETTING IT RIGHT FROM THE START

Introduction

Child health promotion policies are based on the fundamental understanding that prevention of problems and promotion of wellbeing are more effective than treating established problems. Furthermore, early intervention is proven to be more effective and cost-effective than late intervention [85].

In recent years, new evidence has come to light showing that trajectories of child wellbeing may be set long before birth and even before conception, a process known as early life programming [86,87].

Effective promotion of child wellbeing requires the development of interventions that can support healthy child development or modify risk factors at or before the time when these determinants begin to influence child health. The implication of early life programming research is clear: we should not wait until after birth to start promoting child health.

Current research is aimed at providing a more precise understanding of how early life factors may influence child and adult health. Generally speaking, the preconception and pregnancy risk factors that are now being reported in the medical literature are risks that have been known for decades to be harmful to health, such as smoking or mental health difficulties, yet these remain challenging problems in our communities. An understanding that these risk factors can affect future child health adds urgency to the call to address these problems, while the current lack of robust evidence for effective interventions illustrates a need to consider new strategies and approaches that capture the complexity of these pathways.

This chapter outlines what is currently known about several key maternal factors reported to be associated with child health outcomes: pregnancy planning; nutrition and weight management; stress and mental health; and use of tobacco, alcohol and drugs. The next sections summarise current knowledge about the child outcomes that are most strongly affected by these maternal factors. The final section describes the literature around interventions, service provision, and measuring and monitoring, and discusses approaches for developing effective strategies to modify these early pathways.

Why intervene early?

Recent years have seen increasing empirical support for the developmental origins of health and disease (DOHaD) model [88], which proposes that early life exposures may affect future health. One of the earliest observations leading to development of the DOHaD model was the finding that low birthweight is associated with the risk of chronic disease in adult life [87], and more recently birthweight has been linked a range of other outcomes [89].

More recent work has begun to identify specific pathways for these effects, for example maternal cholesterol levels [90]. A concerning finding is that significant exposures may occur before conception and may even have been present in a previous generation: boys born to non-smoking women are larger at birth if their maternal grandmother smoked during pregnancy [91].

The explanation for these effects is based on the concept of developmental plasticity, in which child growth and development changes in response to environmental events [86], by mechanisms such as epigenetic programming, a process by which environments can alter the expression of genes. Pregnancy is known to be a sensitive period for defining epigenetic patterns in an individual; stress and smoking are two examples of pregnancy



exposures that have been observed to alter epigenetic patterns. (See Groom et al. [92] for a review of epigenetics and child health.)

Thus, women's health and wellbeing before pregnancy and before birth may have an impact on their children's health throughout the life course and on into following generations. While intervention and support at any stage of life can be beneficial, intervening in this sensitive time period is a promising strategy with the potential for substantial and long-lasting effects on individual and population health.

Maternal factors that influence child health

Although preconception and pregnancy are considered separately here, in practice there is a continuity between these stages, because (as will be seen in a later section), early pregnancy is a critical period for some risks; yet women may be unaware that they are pregnant at this time. For this reason, pregnancy planning has been identified as an important determinant of child health. Although a similar set of risks operate in both the preconception and pregnancy time periods, tobacco and alcohol intake are discussed in the pregnancy section as the impact on child health is greatest at this time.

Preconception

Preconception health can be defined as “the health of a woman of childbearing age prior to or between pregnancies” [93], and the Centers for Disease Control (CDC) propose that preconception health interventions should address “biomedical, behavioral, and social risks to a woman's health or pregnancy outcome” [94]. An important goal of research in this relatively new area is to identify and quantify these risks. Behavioural risks are of particular interest to health services as they are potentially (although not always easily) modifiable, more so than genetic risks, for example. Also, many biomedical risks, such as a relative deficiency of folic acid, still require behavioural strategies to mitigate them, such as taking periconceptual folic acid supplements.

In 2011, Delissaint et al. [95] published an extensive systematic review of preconception health behaviour research, identifying wide range of preconception factors that potentially could influence maternal or child health. These included pregnancy planning behaviour such as initiating folic acid supplementation; reviewing tobacco and alcohol use and physical activity; optimising glycaemic control; gynaecological care (e.g. screening for sexually transmitted infections); vaccination (e.g. rubella); and, in countries where this was relevant, screening for genetic conditions such as cystic fibrosis. These health issues do not occur in isolation but are influenced by a complex network of environmental circumstances [96].

The following sections will focus on preconception factors that are currently of concern in New Zealand, and that have a significant impact on child health as well as maternal health.

Pregnancy planning

This may take the form of preparing for an intended pregnancy (for example by modifying alcohol intake), or effective contraception use amongst women who do not intend to become pregnant. In a recent study of around 750 women across New Zealand who were questioned shortly after birth, 75% of Māori and Pacific women and 36% of Pākeha reported that their pregnancies had been unplanned [97].

Research into women's attitudes towards pregnancy suggests that concepts of planned and unplanned pregnancies are different from concepts of wanted and unwanted pregnancies, and that circumstances such as the attitude of a partner to pregnancy can be strongly influential in determining how women define their pregnancies [98].

Tsui et al. [99] reviewed the literature on the burden of unintended pregnancy. They commented that evidence relating to child outcomes was sparse, and tended to focus on a few specific outcomes such as prematurity and low birthweight. An additional problem was that many studies were cross-sectional and subject to bias. Nevertheless, there does appear to be evidence of harm. A systematic review [100] of unintended pregnancy



reported that unintended (unwanted or wanted but mistimed) pregnancies were associated with adverse outcomes: unwanted pregnancies had higher odds of low birthweight and premature delivery compared to intended pregnancies. There is also observational evidence of an association between pregnancy intendedness and health behaviours such as smoking before or after the birth and breastfeeding duration [101].

Whether these differences are causal (i.e. ambivalence towards a pregnancy leads to less optimal health behaviours) or associational (the pregnancy is unwelcome because of difficult circumstances which themselves may affect maternal and child health), these findings further reinforce the need for effective approaches to contraception, and suggest that women with an unintended pregnancy may require additional support.

Maternal nutrition

Nutrition is an important aspect of health for women who may become pregnant, but it is also complex: disadvantage may result in a double burden of undernutrition (e.g. lack of essential micronutrients) and overnutrition (e.g. obesity) [102]. In addition, it is difficult to study any single nutritional issue in isolation from other factors. Although macronutrient intake (weight management and healthy eating) and micronutrient intake are discussed under separate headings here, they are of course strongly interlinked. However, there is a lack of robust evidence about the relative impact of different aspects of preconception nutrition on child health, as discussed in a recent systematic review [103]. Some observational findings are discussed but this is still an emerging field.

Macronutrient intake

Preconception obesity has been linked to a number of adverse child outcomes, including child obesity [104], and neural tube and congenital heart defects [102]. A systematic review of the impact of obesity on child neurodevelopmental outcomes noted a number of studies reporting associations, but concluded that it is not yet clear whether there is a causal effect and called for more experimental studies [105]. The review authors noted that there are several alternative explanations for these findings, for example that obesity could be a marker for nutritional problems such as deficiency of folate or vitamin D.

On the other hand, women who are underweight in the preconception time period have a 32% higher risk of preterm birth and small-for-gestational-age babies [102].

There are indications from observational studies that preconception eating patterns may influence child outcomes. For example one study [106] reported that women categorised as having a high protein/fruit intake in the 12-month period prior to conception had a decreased likelihood of preterm birth, whereas women with a high fat and sugar component to their diet had a shorter gestation and higher likelihood of preterm birth and their infants had shorter lengths at birth. Another study, however, reported that a preconception diet high in sweetened beverages and sugars was also associated with smoking and reduced physical activity [107], highlighting the need for caution when drawing inferences from these findings.

Micronutrient intake

The importance of adequate folic acid intake is illustrated by the fact that preconception folic acid supplementation has the strongest evidence of effect of all forms of micronutrient supplementation: it is estimated to prevent 69% of neural tube defects [102]. Women can obtain folic acid from fortified foods and vitamin supplements, as well as from a varied diet [108]. These options are further discussed in the section on interventions.

Diabetes

Women with diabetes are particularly at risk of adverse pregnancy outcomes such as stillbirth and congenital anomalies. Good glycaemic control and folic acid supplementation prior to becoming pregnant can largely eliminate these risks [109].

Interdependence of preconception factors

These preconception factors do not occur in isolation. Because many factors such as smoking and alcohol use have strong social patterning, individuals who are disadvantaged may experience several factors simultaneously, increasing the cumulative effect on child



health. The issue of women experiencing multiple adversities in pregnancy, and interventions to support them are the subject of a previous in-depth topic [110] and thus will not be discussed in detail here.

In addition, the presence of one risk factor may directly increase the risk of another. One important example is binge drinking, which increases the risk of unplanned or unprotected sexual intercourse and hence, the risk of unintended pregnancy: one study found that 60% of women who reported four or more binge episodes in the three months before conception also reported that their pregnancy had been unintended [111]. There was a clear stepwise increase in the proportion of unintended pregnancies as the frequency of binge drinking episodes increased.

Another example is mental health: unintended pregnancy has been reported to be associated with increased risk of depression and higher parenting stress [112], both of which are risk factors for child health.

Pregnancy

Maternal nutrition

As for preconception nutritional health, while observational evidence strongly indicates that maternal nutrition in pregnancy affects child health, there is a lack of randomised controlled trials examining nutrition factors, and as a result, it is not clear to what extent these associations are causal (and by implication, which aspects of nutrition hold most intervention promise). Selected observational findings are summarised here, but there is a clear need for further research in this area.

Macronutrients

Obesity in pregnancy has been linked to a number of adverse outcomes for the child including cognitive difficulties, attention deficit hyperactivity disorder, eating disorders in adolescence, and psychotic disorders in adulthood [105].

The authors of large prospective cohort study in the UK [113] reported that maternal dietary pattern at 32 weeks' gestation was strongly associated with maternal anxiety levels: in particular, low intake of fish or n-3 polyunsaturated fatty acids (PUFA) was associated with high levels of anxiety. Women reporting diets characterised as 'health-conscious' or 'traditional' were less likely to report high levels of anxiety symptoms. Low levels of seafood consumed during pregnancy have been linked with poorer outcomes across a range of child development measures despite adjustment for confounders in a large prospective cohort study [114], indicating a need to balance the benefit of n3-PUFA against the risks of mercury ingestion [115]. An additional concern with diet is uncertainty about the role of antigen avoidance and food allergy in children [116].

Increased maternal weight gain in pregnancy is associated with increased birthweight and fetal growth [117,118]. Excessive weight gain during pregnancy has been strongly linked to adiposity and cardiovascular risk factors [119] in children. On the other hand, too little weight gain may result in poor growth and low birthweight [118].

In addition, a strong association is seen between poor glycaemic control (in women with diabetes) and child outcomes, particularly macrosomia at birth and increased incidence of cognitive and behavioural problems [120].

Micronutrients

Folic acid, as previously discussed, is the micronutrient with the strongest evidence in favour of supplementation, to reduce the risk of neural tube defects. There is also rising concern about Vitamin D deficiency as evidenced by the re-emergence of rickets in many populations in recent years [121].

Some risks are more subtle, and are emerging as findings in large cohort studies that measure many metabolic pathways. For example, low maternal iodine in pregnancy is reported to have an association with poorer cognitive development in children. This was supported by findings from the Avon Longitudinal Study (ALSPAC), and was somewhat



unexpected as the study is located in England where iodine deficiency is not considered to be a major public health problem [122]. Iodine deficiency has re-emerged in the New Zealand population in recent years [123]. Intervention approaches are discussed in a later section.

Selenium has also been suggested as a micronutrient of importance in pregnancy (see Bergamaschi [124] for a review). Although most of the effects of low selenium proposed in the literature relate to maternal health, Bergamaschi et al. reported there is some evidence of an association of low selenium and preterm delivery. Further work is required to clarify whether selenium supplementation in pregnancy would be beneficial.

Undoubtedly in future years, other micronutrient needs will be described that are currently unknown. However, it is also important to note that overuse of micronutrient supplementation can be harmful: for example, overnutrition with Vitamin A may cause congenital abnormalities and intake above 700 micrograms is not recommended.

Mental health

There is now a substantial body of evidence on adverse child outcomes following maternal mental health problems. Much of this originates in the USA, but Schmied et al. have published a systematic review of maternal mental health in the perinatal period (pregnancy and one year after the birth), based on evidence from longitudinal studies in Australia and New Zealand [125]. This paper is also a good source of locally-based studies on the prevalence of mental health problems during pregnancy and afterwards.

Although any mental health problem may appear or become exacerbated during pregnancy, current research is focused on three common conditions which appear to have a profound effect on child health and wellbeing: depression, anxiety, and stress.

Depression is common, affecting 10–20% of pregnant women [125]. A large meta-analysis found that maternal depressive symptoms in pregnancy were associated with preterm birth and low birthweight [126]; other child health consequences include a higher risk of child mental health problems and cognitive difficulties [88,125]. Depression during pregnancy is also strongly associated with health behaviours that may be harmful to child health such as smoking or alcohol use [127]. In addition, psychotropic medication may have effects on fetal health [88], although the evidence is conflicting. Unsurprisingly, a previous history of depression and having a poor partner relationship (including experiencing violence) are reported to be strong predictors of depression during pregnancy [125].

Austin et al. distinguish between stress and anxiety, stating that “Stress can be defined as a psychophysiological consequence of any event challenging an organism’s capacity to cope, while anxiety is considered the psychological consequence of exposure to real or imagined stress” [128]. This distinction is not always made in the literature, where the terms ‘stress’ and ‘anxiety’ may be used interchangeably. However, as discussed below, when they are defined separately, anxiety and stress seem to have different effects on birth outcomes. Another distinction is that pregnancy-specific stress or anxiety appears to be different from generalised stress, and to have more impact on fetal outcomes [129].

While not all authors report large effects [130], there is now evidence from a number of populations that maternal stress increases the risk of preterm delivery [128,131] and is associated with a range of emotional and cognitive problems in children, including attention deficit/hyperactivity disorders, language delay,[132] and overall infant development during the first year of life [133].

Research on stress in pregnancy has identified several sources of stress for pregnant women in the USA that are also severe enough to show a significant association with birthweight: these include unemployment, overcrowding, and racism [96,134]. Domestic violence is reported to have an association with preterm delivery and low birthweight [135].

Although the mechanisms are not fully understood, it is clear that both maternal and fetal hormonal physiology, particularly cortisol pathways, are affected by maternal stress [132]. Recent research has also highlighted the role of the placenta as the link between maternal



and fetal stress responses. A study of placental blood flow in the third trimester reported reduced flow associated with intrusive thoughts and emotional distress regarding the fetus, potentially explaining how this could affect fetal growth [136].

Although both stress and anxiety are potentially harmful to child health, there are indications that stress has more of an impact on preterm birth, while anxiety affects birthweight to a greater degree [96]. This hypothesis is supported by a study that used sophisticated modelling techniques to disentangle the complex web of cause and effect around stress. Lobel et al. reported that pregnancy-specific stress was a stronger predictor of birth outcome than anxiety or life-event stress [129]. Their results indicated that although pregnancy-specific stress was associated both with earlier delivery and with lower birthweight, only earlier delivery appeared to be a direct effect of stress, while the association with birthweight was explained by the fact that women who felt stressed were more likely to smoke. In this study, pregnancy-specific stress also predicted higher caffeine intake and less healthy eating, and lower vitamin use and exercise.

The link between stress and smoking is consistent with evidence both from New Zealand [137] and from reviews of the USA experience [96] that maternal stress in pregnancy predicts smoking behaviour.

Identifying mental health risks is an active area of research; but there is little corresponding research on mental health strengths and how these may influence women's health and that of their children.

Positive mental health is now recognised to be a construct in its own right, not simply the absence of mental health problems. This is known as the 'dual continuum' model of mental health [138] and it has important implications for how mental health should be promoted, emphasising that this involves more than just preventing problems [139]. This is an early field of research but the author of a World Health Organization (WHO) review notes the evidence that improving positive health can result in improved health behaviours such as reduced alcohol intake and smoking, and that positive mental health is associated with prosocial behaviour and stronger feelings of social connectedness [140]. The author outlines the population health potential of keeping a clear separation between positive mental health and mental health problems, concluding that "a key rationale for promoting positive mental health is the hypothesis that by increasing mental health, we can modify certain outcomes, even if mental illness remains and/or even if other risk factors remain". See the measuring and monitoring section for a corresponding discussion about positive mental health in children.

Smoking

Smoking during pregnancy has been implicated in a number of adverse pathways; however a very large (n=52,919) and carefully designed study [141] did not detect an effect on many proposed outcomes, including cognitive development, conduct disorders and asthma, in children of women who smoked during pregnancy. Smoking has also been suggested as a cause of Attention Deficit Hyperactivity Disorder (ADHD), but this association has been assessed as being likely to be due to confounding factors [142].

Child health outcomes for which there is convincing evidence of a causal effect of smoking during pregnancy include Sudden and Unexpected Death in Infancy (SUDI), low birthweight, obesity, and smoking in offspring. As previously mentioned, smoking during pregnancy is a well-known cause of infants born small for gestational age and is estimated to reduce birthweight by 90–170g [141,143]. There is evidence for an increased risk of obesity in offspring of mothers who smoke during pregnancy [141,144] independently of other confounding factors, with evidence of a dose-response effect and of possible differences in risk by ethnicity [145].

Finally, children of smokers are more likely to smoke themselves. There are obvious social and environmental factors to explain this, but there is now also evidence for a direct effect of smoking during pregnancy on smoking uptake in offspring [146], possibly due to induction of increased nicotine sensitivity in utero.



Alcohol

The child health effects of heavy drinking in pregnancy are well known: maternal intakes of greater than about 1 drink/day on average (or alternatively, binge drinking) have been unequivocally linked to increased risk of congenital malformations and developmental and psychosocial problems [147]. These effects are together known as Fetal Alcohol Spectrum Disorder (FASD) [148,149].

However, it has been much more difficult to establish the effects of low or moderate drinking and results have been contradictory. Because of confounding (low-moderate drinkers tend to be well-educated and otherwise healthy), observational studies have not shown a reliable link between low alcohol intake and child outcomes [150,151]. This has led to controversy in developing guidelines for alcohol use in pregnancy [152], with some bodies supporting low to moderate alcohol intake and others recommending total abstinence. However, newer methodological techniques may provide better evidence in the near future. A major study of alcohol intake on adult health has recently been published, using a technique called Mendelian randomisation to minimise bias from confounding [153]. The findings of this study suggest that lower alcohol consumption is associated with a reduction in coronary artery disease, even among light to moderate drinkers. A recent study of antenatal alcohol exposure using the same technique reported that maternal genetic propensity for alcohol intake predicted school performance in children among affluent women reporting moderate drinking [154]. This is a new area of research but the findings from these studies suggest that there may not be any safe level of alcohol intake in pregnancy.

Drugs

Illegal substance use during pregnancy is a well-established cause of adverse fetal and child outcomes (see Jansson [155] for a review). Amphetamine and opiate intake appears to have less impact on fetal growth than smoking [156], nevertheless, opiate use (heroin) significantly increases the risk of low birthweight, obstetric complications, cognitive and behaviour problems; and it is estimated to cause a 74-fold increase in the risk of sudden death in infancy [157].

Other

There is currently no strong evidence that maternal oral health has a beneficial effect on child health, but several studies have reported associations of oral disease with adverse child outcomes such as preterm birth [158]. This is clearly an area for future research.

Child outcomes affected by maternal risk factors

Lewis et al. have summarised the mechanisms for maternal effects on child health in terms of placental mechanisms, where maternal factors impact on placental function and intrauterine growth retardation is likely to be a final common pathway, and fetal mechanisms, which include responses to blood-borne factors or epigenetic changes [88].

Infant and child mortality

Most of the studies cited in this review did not report on infant mortality as an outcome. However, identified risk factors relevant to children in New Zealand include exposure to alcohol, tobacco smoke and drugs [157,159]; prematurity; and congenital anomalies [2]; suggesting that this represents the worst-case outcome of many of the maternal risk factors discussed in this review. In New Zealand, maternal smoking is known to be a major cause of Sudden Unexpected Death in Infancy (SUDI), particularly in association with bedsharing [160].

Prematurity

Premature birth exacts an enormous cost on children's health, including, but not limited to, increased infant mortality and neurodevelopmental disability, and, in adulthood, hypertension and kidney disease [161]. Furthermore, girls born preterm are more likely themselves to deliver preterm, with complications continuing into the next generation [126].



Low birthweight

Considering low birthweight as an outcome can be misleading because it is generally agreed that low birthweight is not in itself a health problem or a cause of other health problems [89]: instead, its usefulness is as a marker of poor growth in utero that is easy to measure and routinely available for almost all children (see below for a discussion of monitoring birthweight and its relationship to gestational age).

Child development and mental health

The global prevalence of child and adolescent mental health disorders is estimated to be 10–20% [162]. It has been estimated that even optimal treatment at optimal coverage can only mitigate 28% of the burden of mental health disorders [163]. Prevention is thus a key strategy [164], and the evidence now emerging about the impact of preconception and pregnancy factors on child mental health strongly indicates that prevention of child mental health problems should begin before birth [88].

Lewis et al. [88] suggest that prenatal exposures relevant to child mental health can be organised into lifestyle factors (e.g. nutrition); maternal mental health problems; and teratogenic and neurotoxic exposures (such as alcohol).

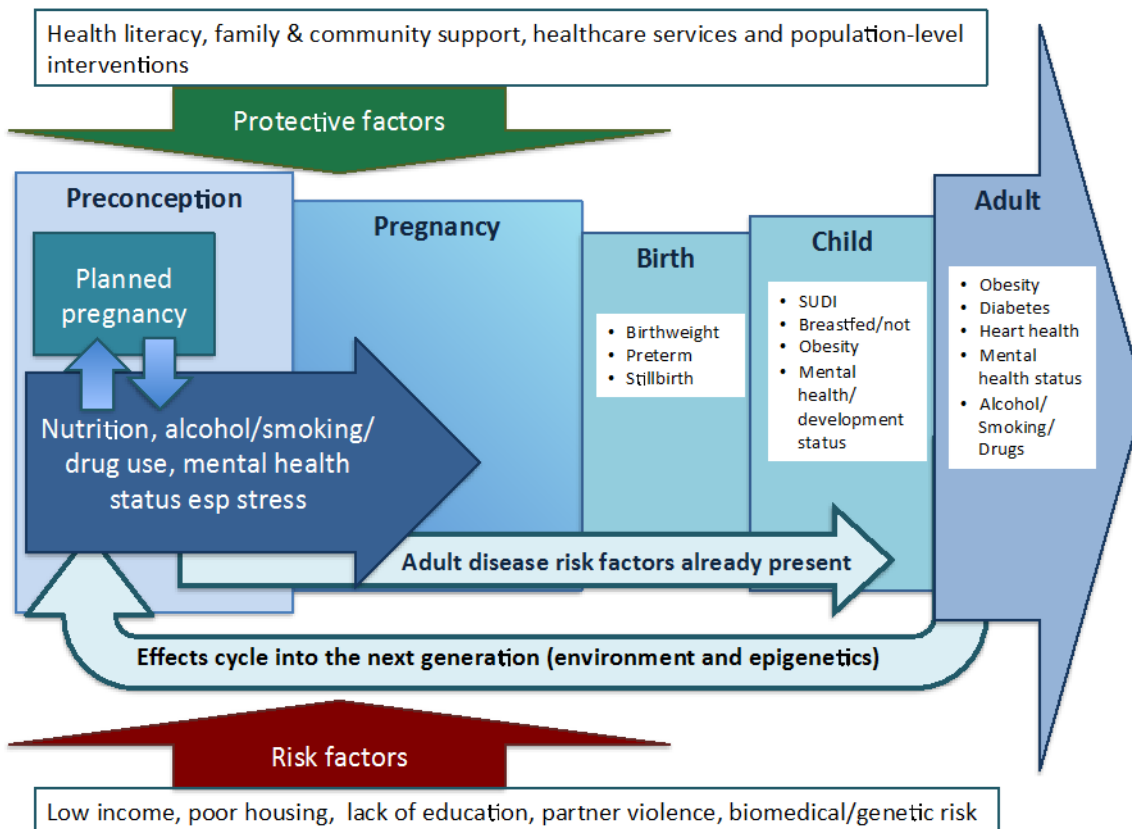
Suboptimal fetal growth is the final common pathway of many of these risks, most notably maternal smoking, alcohol and drug use; poor nutrition; stress; and infection during pregnancy. Poor fetal growth has been linked to a number of mental health disorders in offspring, including impaired cognitive function, inattention/hyperactivity, stress reactivity and possibly personality disorders and schizophrenia [89]. Although there is evidence for all of these pathways, one of the most important single risk factors is likely to be antenatal maternal stress: Talge et al. have estimated that up to 15% of behavioural problems in children may be caused by this single factor [132].

Identifying the antenatal causes of mental health problems is an active area of research, but little attention has been given to positive mental health, and to positive preconception and pregnancy factors that may promote this. This issue is further discussed in the 'Measuring and monitoring' section (see page 178).



Overview: Current understanding of preconception and pregnancy effects on child health

Figure 92. Links with preconception and pregnancy health across the life course



As **Figure 92** indicates, child health risks can begin in the previous generation(s) and the cycle of harm can extend across generations if not interrupted. The diagram reflects the current literature in being predominantly about risk; but when pathways to positive outcomes are better understood, effective interventions may arise from promoting these. The diagram also shows that there are multiple potential time points and populations for intervention. These are considered in more detail in a later section.

In linking specific risk or protective factors to specific outcomes, some caution is required because most of the studies reviewed in the previous sections were observational rather than randomised controlled trials (RCTs). RCTs are the 'gold standard' method for determining the effect of risk or protective factors on outcomes, but for many of the health risks discussed here, RCTs would not be ethical. This means that studies are vulnerable to bias: when many risk factors coexist (such as smoking, alcohol use and poor nutrition) but are incompletely measured or (as commonly happens) when these multiply occurring risk factors are studied in isolation rather than together, it can be hard for health planners to establish which of many potential intervention strategies have the most potential to influence outcomes.



Interventions

Implementing interventions to improve preconception and pregnancy health requires having sustainable efficacious and effective interventions and the means to measure change. These are challenging requirements at present. Many of the same difficulties encountered in identifying preconception and pregnancy risks are also apparent in evaluating interventions or comparing one to another. Testing interventions rigorously using an RCT design is often not feasible. In addition, studies show wide variation in populations, intervention approaches, and measurement of risks, outcomes, or confounders: as a result, it is rare for intervention studies to be similar enough to be combined into a meta-analysis. Thus, systematic reviews of interventions aimed at improving maternal health in pregnancy and in the preconception period are often inconclusive.

The following subsections will review the current evidence on intervention, considered in terms of timing and populations to target; whether focused on preconception or pregnancy life stages; issues-focused interventions or service strategies; and whether these are delivered at the individual or population-level. Most of the evidence reviewed is from observational studies; where evidence from RCTs are available this is indicated. At the end of this section, current evidence on measuring and monitoring health is reviewed as an introduction to the next section which discusses challenges in translating the evidence.

In this review, the focus is on strategies that can be implemented within the health services framework. It is recognised, however, that interventions that are not primarily about health may have a profound influence on pregnancy and on child wellbeing.

A final note is that, as this review demonstrates, the health of mothers and children is closely interlinked. This close alignment of health goals is a compelling argument in favour of better continuity of care between life stages (for example preconception to pregnancy to postnatal care; pregnancy to childhood) and between services [165]; the separation presented here is to aid clarity but in practice, these aspects are overlapping and are continuous with one another.

Timing of interventions

In considering the best time to intervene, two aspects to consider are sensitive periods during which a risk factor may have a greater effect than at other times (indicating critical intervention points), and cumulative effects over time which give an indication of the value of earlier versus later intervention.

Early pregnancy represents a critical period for many risks as it is an active time of growth and development, and is a time of high fetal sensitivity to environmental influences. This hypothesis is supported by observational studies, particularly with regard to alcohol intake and FASD [149]. A recent prospective study from the UK examined the effect of timing of alcohol consumption on birthweight and prematurity risk [166], reporting that the strongest association between alcohol consumption and birthweight or prematurity was seen in the first trimester.

A new body of research is also suggesting an important role for nutrition in early pregnancy, in particular that poor nutrition may adversely affect brain development [167]. The effect of maternal weight on child outcomes appears to vary according to the timing of the risk: one study [168] reported that maternal pre-pregnancy weight had a stronger association with childhood BMI and cardiovascular risk than weight gain during pregnancy; during pregnancy, higher weight gain in early (but not mid- or late-) pregnancy was associated with increased risk of childhood overweight and cardiovascular risk factors.

A US study [169] of 4600 pregnant women reported that the prevalence of past month serious psychological distress was 6.4% for women in the first trimester of their pregnancy and 3.9% in the third trimester, suggesting that early pregnancy might be a particularly vulnerable time. However, the sensitive period for an effect of stress on pregnancy outcomes may be later than that: a large study from Sweden [131] reported that maternal stress during months 5–6 of pregnancy had the strongest association with birth outcomes



such as preterm delivery, shorter gestational age, low birthweight and small-for-gestational-age, while a different large cohort study found that stress on behavioural and emotional problems was greater at 32 weeks than at 18 weeks [170].

There may be a cumulative risk for smoking during pregnancy: in one study, the effect of smoking on fetal growth at 34 weeks was milder for mothers who stopped smoking before 12 weeks compared to those who continued [171], while in another, infants of women who stopped smoking before or during early pregnancy had no increased risk of being small for gestational age or preterm compared to infants of non-smokers [172].

Populations to target

Pregnancy offers many opportunities for health promotion because most women engage with health services at this time [88]. However, many pregnancies are unplanned and as this review shows, there is substantial evidence for the need to support preconception health. This has important implications for service delivery. Pregnant women are a well-defined population who are likely to make contact with health services by a number of routes. Women of childbearing age who are not pregnant, by contrast, are a much larger group with little routine contact with health services; yet this is the population of interest for preconception health interventions.

One more efficient way to define the target population for preconception health interventions is to focus on women who may be at an interconceptional stage, i.e. women who have had at least one previous pregnancy [173] and can therefore be identified using routine healthcare datasets. In some settings, a negative pregnancy test result can present an opportunity for intervention [174]. Another option may be to focus on women attending fertility- or preconception healthcare clinics: these women, however, are likely to be already highly motivated and well-informed about preconception health [173].

An alternative strategy for preconception health promotion is to identify and target women who are most at risk of adverse outcomes. These might include women who have previously delivered a very low birthweight infant [173], teenagers and young women, women from historically disadvantaged ethnic groups, and women known to be at risk from violence, alcohol or drug use.

However, interventions which focus solely on pregnant women or women who may become pregnant are likely to be limited because they do not take context into account, for example, addressing smoking habits of pregnant women without considering the other people in the household who are smoking [137]. Similarly, as noted, stress is likely to be a driver of high-risk behaviours; addressing the behaviours without addressing the stress is unlikely to be helpful.

Pryor et al. have reported some interesting findings from the Growing Up in New Zealand study [175] in a paper which provides a snapshot of the children's fathers during pregnancy. Approximately 18% (728/4156) were current smokers, and 806 men reported that they had cut down on smoking (by smoking outside only, cutting down or quitting), 43% had reduced their alcohol intake, and half of the men interviewed were eating more fruit and vegetables. This suggests a potential for including partners in interventions supporting women to make healthier choices during pregnancy.

Also of note is that although the prospective fathers expected their partners would have a greater involvement and responsibility with caregiving than themselves, 78% intended to be involved with the day-to-day care of the child. This is encouraging in the light of emerging evidence for the value of social support, including partner support, on maternal wellbeing [96]. Support needs might include for example emotional support to reduce stress or tangible support such as help with transport to access antenatal care, or help with food shopping to support healthy eating [96].

Thus, identifying different target populations suggests that there are multiple potential levels of intervention and service delivery, including individually based care delivered by a Lead Maternity Carer; family/Whānau e.g. Whānau Ora approach [176]; women considered to be at risk; all women of childbearing age e.g. "Show Your Love" campaign in



the US (see box below); and whole population approaches such as smoking legislation [177] or mandatory micronutrient fortification of foods [97,178].

Intervening at the preconception stage

Interventions in the preconception period can be aimed at stopping or reducing high-risk behaviours such as binge drinking or smoking, or alternatively initiating and maintaining positive behaviours, for example, folic acid supplementation or healthy eating [95].

In 2006, the Centers for Disease Control (CDC) published a set of recommendations for improving preconception health, based on literature review and expert consensus [94]. The recommendations are based on the US health system and are not always applicable to the NZ context, for example in calling for more complete health insurance coverage for women with low incomes. Also, the recommendations begin by calling for 'individual responsibility across the lifespan', an emphasis on individual effort that is not shared by other authors [96].

Overall, the evidence for specific preconception health interventions is somewhat inconsistent. The authors of a recent systematic review of preconception interventions [179] concluded that there was substantial evidence of effectiveness for interventions targeted at dietary change and birthweight, smoking, and folic acid use. In the successful smoking intervention identified in this review, women were given a video, a guide and counselling [180]. This contrasts with the findings of a Cochrane review of nicotine replacement therapy which reported no benefit [181].

Evidence for the effectiveness of preconception alcohol reduction interventions is likewise mixed [179,182] with no clearly effective widely-available intervention. One interesting development is a report on a web-based self-guided change intervention to reduce alcohol exposure in pregnancy in the USA [183]. At baseline, all women receiving the intervention had some alcohol exposure and were not using effective contraceptive methods. At 4 months, 58% of the enrolled women were no longer at risk of alcohol exposure in pregnancy. Child outcomes were not measured in this study. Participant characteristics were similar to those of typical internet users in the USA, suggesting that the intervention may be particularly suitable for this group. However, lack of access to the internet by more disadvantaged women would prevent this from being more widely used in high-risk populations.

The role of health services in preconception care

In seeking to improve preconception health at the individual level, there is some evidence for the effectiveness of programmatic approaches, targeting multiple interventions [179]. For example, a case-control study of women attending a preconception care service in Brisbane between 2010–2013 [184] found that women who had received preconception care were more likely to report adequate periconceptual folate, being vaccinated against influenza and hepatitis B, specialist consultation regarding a pre-existing health condition, less weight gain up until booking, and a lower incidence of hypertensive disorders in pregnancy, compared to women who had planned their pregnancy but had not used the service.

In New Zealand, best practice guidelines for general practitioners [149] recommend asking all women of reproductive age about pregnancy risk or intent. In a general practice consultation, advice can then be tailored to the needs of the individual.

However, multiple contacts may be necessary: a Cochrane review of the effectiveness of routine pre-pregnancy health promotion [185] found that brief advice about folic acid supplementation had no detectable effect, while an intervention that delivered several sessions of group education was associated with increased consumption of folic acid supplements.

The role of population-level strategies in preconception care

Interventions targeted at women who intend to become pregnant are limited by the fact that such measures cannot address the consequences of unplanned pregnancy. Alternative strategies include aiming to improve health in all the population (see Box below



Case Study: Show Your Love). Effective interventions to reduce harm from risks such as substance use in the general population are likely to benefit pregnant women whether or not the pregnancy was intended. For the New Zealand context, a more detailed summary of population tobacco cessation interventions can be found at **Table 52** (on page 294), and of alcohol interventions at **Table 64** (on page 334).

Young people are particularly at risk of unplanned pregnancy in the setting of high-risk behaviours and there is an urgent need for interventions for this vulnerable population. Bearinger et al. have reviewed the challenges and approaches to sexual and reproductive health in adolescents, taking a global perspective [186].

Interested readers are also referred to an excellent review of interventions for young people by Jackson et al. [187]. The focus of this paper is on addressing multiple risk behaviours, in particular tobacco, alcohol and illicit drug use and sexual risk behaviour. The authors considered interventions delivered through a number of platforms including mass media campaigns, alcohol and tobacco pricing, school-based programmes and family-based interventions. They identified few interventions with clear evidence of effectiveness, but noted that multi-component interventions appeared to have the most effect. Another interesting finding from the review was that one of the more successful interventions was aimed at pre-adolescent children, not (as is more usually the case) children in early- to mid-adolescence. Finally, the authors noted that effective interventions aimed to increase young people's resilience and to support positive development, instead of simply focusing on reducing risk behaviours.

Case Study: Show Your Love

Show Your Love (<http://www.cdc.gov/preconception/showyourlove/>) is a national campaign in the USA, designed to improve the health of women and babies by promoting preconception health and healthcare. Information and resources are provided for members of the public, health professionals, policy makers and the media.

A key feature of this campaign is its broad target population: it is aimed at both women and men, and is not restricted to people planning to have children, noting that "preconception health is important for all women and men, whether or not they plan to have a baby one day". In this way, it aims to improve outcomes both for planned and unplanned pregnancies. In addition, the campaign explicitly recognises that there are health benefits for people who never have children: the campaign button for women who want to become pregnant is "Show Your Love. Your baby will thank you for it", while the button for women who do not want to become pregnant is "Show Your Love. Your body will thank you for it."

In recognition of the high proportion of unplanned pregnancies in the USA, a central strategy of the campaign is to reduce the number of unplanned pregnancies by encouraging individuals to develop a "Reproductive Life Plan".

The campaign was launched in 2013 and it will therefore be some time before it can be formally evaluated, but it is robustly evidence-based. The design of the campaign was informed not only by evidence on risk factors and pathways but, importantly, also by evidence on issues for implementation such as audience research, reaching vulnerable populations, and how to bundle several health topics into an intervention package. A good source for further detail on these approaches can be found in the commentary by Mitchell and Verbiest [93] in a special supplement issue of *the American Journal of Health Promotion*.

Further development of preconception care in New Zealand

Because understanding of the importance of preconception health is relatively new, in New Zealand, health service support is not as well-established as for antenatal services. The recent "Inquiry into improving child health outcomes and preventing child abuse with a focus from preconception until three years of age" (and government response) [188,189] has highlighted this as an area that requires development.

The World Health Organization has published a policy brief entitled "Preconception care: Maximizing the gains for maternal and child health" [190]. The authors define the scope of preconception care as "the provision of biomedical, behavioural and social health interventions to women and couples before conception occurs", with the aim of "improving



their health status, and reducing behaviours and individual and environmental factors that contribute to poor maternal and child health outcomes”.

This is a consensus document based on expert opinion. The recommendation in the policy brief is for preconception healthcare to be delivered as a ‘preconception care package’, addressing diverse topics such as psychoactive substance abuse and interpersonal violence that are ultimately seen to be connected. **Figure 93**, reproduced from this document, summarises the steps that could be taken at a national level to implement these recommendations.

Figure 93. A strategy for country action



Figure reproduced from WHO policy brief for preconception care [190]

Intervening during pregnancy

In this section, interventions are first considered in terms of specific health topics, then as service provision approaches, and finally as applied to the whole population.

Intervening on specific health topics

The literature on topic-specific interventions is extensive; for this review the focus is on pregnancy health topics that are likely to have the most influence on child health and is intended to be illustrative rather than exhaustive.

Nutrition

The NICE guidelines for antenatal care [191] recommend that folic acid supplementation should continue throughout the first 12 weeks of pregnancy, at 400 micrograms per day. (Fortification of food using folic acid and iodine is discussed in the section on population-level interventions below.) Under the NICE guidelines, women are also advised to consider Vitamin D supplementation (10 micrograms per day). There is, however, conflicting evidence about the effectiveness of maternal Vitamin D supplementation on offspring bone mineral density [192,193].

Weight gain in pregnancy

The Institute of Medicine (IOM) has recently updated its advice on optimal weight gain during pregnancy, based on new evidence that suggests that women should gain less weight than was previously thought. The guidelines are reproduced in the Ministry of Health 'Guidance for healthy weight gain in pregnancy' [194]: for example, a woman of with a BMI in the healthy range (18.5–24.9) should aim to gain 11.5–16kg during pregnancy. The guidelines also stress the importance of weighing and measuring women rather than relying on self-report and provide examples of advice that can be given for healthy nutrition and exercise during pregnancy.

The IMPROVE (Improving Maternal and Progeny Risks of Obesity Via Exercise) study is a promising Auckland-based RCT investigating the effect of an antenatal exercise programme on maternal and fetal outcomes, and is currently ongoing [195].

Smoking

Interventions to ameliorate the health effects of smoking may take place at population or individual level. A recent systematic review and meta-analysis reported that smoke-free legislation was associated with reductions in preterm birth and hospital attendances for asthma. A slight decrease was seen in the incidence of low birthweight although this was not significant at the 95% confidence level [177].

The New Zealand Ministry of Health has guidelines on smoking cessation in pregnancy [196], based on a review of the literature. The guidelines stress the importance of offering multi-session behavioural smoking cessation interventions to all pregnant and breastfeeding women and recommend conservative use of nicotine replacement therapy (NRT).

A more recent Cochrane review has concluded that psychosocial interventions to support women to stop smoking during pregnancy can be effective in decreasing the prevalence of smoking during pregnancy and can reduce the incidence of low birthweight and prematurity [197]. Types of interventions assessed in this review included incentive-based interventions, feedback interventions, counselling, health education, and social support. Incentive-based interventions had the largest effect sizes when compared with less intensive interventions. Counselling interventions appeared to have significant effects only where counselling was provided along with other types of intervention, while evidence was mixed for health education.

Also, the review of NRT to which the NZ guidelines refer [198] has since been superseded by a more recent Cochrane review of pharmacological interventions (e.g. NRT) for smoking cessation in pregnancy [181] which did not identify a difference in smoking cessation in later pregnancy between pregnant women offered NRT and controls. There appeared to be no differences, either positive or negative, in pregnancy outcomes (reported as stillbirth, premature birth, birthweight, neonatal intensive care admissions and neonatal deaths). The authors recommended that the next step should be placebo-controlled RCTs investigating higher doses of NRT.

Alcohol

Links to evidence on overall population alcohol interventions were provided in an earlier section. One major barrier to effective alcohol intervention during pregnancy is likely to be the timing of risk, given that the most sensitive period occurs before women may be aware they are pregnant [166] and before they are likely to have made contact with antenatal providers [199].

Mental health

Routine screening for mental health problems in pregnancy is recommended, but to date the evidence of effect is limited. A systematic review identified two trials [200]. In one, use of an antenatal diagnostic tool did appear to increase physician awareness of risk, but in the other, an intervention consisting of communication of test scores and a patient information booklet was not associated with reduction in Edinburgh Depression Scores at 16 weeks after delivery, compared to controls who received standard care. A systematic review of mind-body interventions for anxiety during pregnancy reported "some but no



strong evidence” that this type of intervention could reduce anxiety [201]. These results seem to suggest that identifying women with mental health problems in pregnancy is not difficult; rather, the challenge is to follow diagnosis with an effective intervention.

For current recommendations about perinatal and infant mental health services in New Zealand, see the “Healthy Beginnings” guidelines [176], and for a detailed review of child and adolescent mental health services, see the previous in-depth review of this topic, in the 2012 report, “The Determinants of Health for Children and Young People in New Zealand” [110].

Dunkel Schetter reviewed the current state of knowledge on coping in pregnancy and how this could be supported [96]. She concluded that this is an area requiring more research, amongst other reasons because previous research has been too nonspecific to generate robust theories or evidence. As a first step, she recommended that studies of coping behaviours in pregnant women should gather information on the specific stresses experienced by women in a population and the strategies they currently use to manage stress. This understanding could then be used to select the most appropriate coping and stress management interventions from an array of existing options.

Service provision during pregnancy

Services available to pregnant women include universal services, targeted services, and services outside the maternity framework, including antenatal education.

Universal services

Publicly funded maternity and child health services in New Zealand cover the period from preconception to 6 years [202].

Early access to antenatal care is highlighted as an important population health goal. NICE recommends that first contact should occur in the 1st trimester and ideally before 10 weeks [191]. This has been recommended as a target for New Zealand and is under consideration by the Ministry of Health [189]. However, a recent study of young (<20 years) Māori women reported that, although the participants promptly initiated contact with health services upon realising they were pregnant, many encountered systematic barriers to accessing care, for example, being unable to register immediately with a Lead Maternity Carer [199].

In addition to barriers in accessing services, a further concern is that there is limited evidence for the effectiveness of antenatal care in improving child outcomes. Recently, the Lancet published a quality framework review of the scope of midwifery and potential to improve outcomes [203]. The authors identified over 50 outcomes that could be influenced by midwife care, and called for a shift in focus from identifying and treating pathology to providing skilled care for all. They specifically recommended working to strengthen women’s capabilities and to promote normal reproductive processes.

Another opportunity afforded by antenatal healthcare is discussing breastfeeding, but currently, although antenatal promotion of breastfeeding is agreed to be an important discussion [204], there is a lack of consistent evidence regarding the effect of antenatal breastfeeding education on outcomes such as initiation and duration [205] of breastfeeding. See the National Strategic Plan [206] for more detail.

This feeling that current models of care are not optimal has prompted health practitioners to consider novel ways of delivering antenatal care. A systematic review of group antenatal care concluded that this was well received by mothers and that infant outcomes were no worse amongst women attending group antenatal care compared with one-to-one care [207].

Home visits have also been suggested as a method of improving outcomes for women who are drug or alcohol users. However, a Cochrane review [208] of home visit trials was not able to draw firm conclusions due to the poor methodological quality of the trials reviewed and the small number of studies reporting antenatal interventions.



Targeted services

Mental health is an important area where evidence of effectiveness is limited. A systematic review of interventions that could be delivered by midwives to improve maternal mental health and wellbeing [209] did not identify any interventions with clear evidence of benefit. The authors of the review called for further research into midwife-led mental health interventions, pointing out that midwives have multiple contacts with women during pregnancy and would be well-placed to deliver such interventions. However, access to services may be an additional barrier: a study from the USA [169] reported that fewer than half of pregnant women with severe psychological distress were accessing mental health services, and that access was predicted by social advantage.

Likewise, a systematic review of programmes providing additional social support to pregnant women who were at risk of having low birthweight babies did not identify a protective effect on birthweight, but there was a slightly decreased risk of antenatal hospital admission and Caesarean section [210]. However, there are some indications of effectiveness. A PRAMS-based (see below) study of the impact of antenatal counselling on maternal risk behaviour analysed data from just under 200,000 women. The authors reported positive behaviour changes following risk-appropriate counselling for women who used alcohol or tobacco, and that women with unintended pregnancies were more likely to use postnatal contraception [211].

Antenatal education

In New Zealand parenting and pregnancy antenatal education for pregnant women and their partners is offered by a range of providers, and is funded for approximately a third of women in a DHB population [189]. Internationally, reviews of antenatal education have not identified clear evidence that attending antenatal education improves outcomes [212]. One explanation may be that these and other services tend to be accessed less frequently by women who are disadvantaged.

Another identified concern [213] is that because of time constraints, antenatal education can have a limited focus, with much of the content devoted to issues around management of labour such as pain relief.

An alternative approach would be to reframe the aim of antenatal education as health literacy rather than as a simple transfer of information [213]. A health literacy approach would aim to increase women's skills and confidence when making healthcare-related decisions for themselves and their children. Health literacy can be defined as "the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand, and use information in ways which promote and maintain good health." (see Nutbeam [214] for a review of concepts of health literacy relevant to health promotion). Health literacy is critical to empowerment. It can influence health outcomes at three points: access to healthcare, the interactions between individuals and healthcare providers, and self-care, all of which are important for preconception and pregnancy health. Health literacy can enable parents to make better health decisions for their children [215], and there are indications that supporting mental health literacy, in particular, has the potential to improve outcomes for pregnant women [216].

Interventions at the population level

Health interventions implemented at the national level include alcohol and tobacco initiatives as mentioned above; micronutrient fortification is a promising population-level approach for nutrition.

Mandatory folic acid fortification has been advocated for New Zealand but to date has not been implemented. The authors of a New Zealand study in which postpartum women were asked about their folic acid supplementation history and bread intake estimated that 33% of women had received optimal amounts of folate, but that fortification of bread would have increased this to 59% [97]. Furthermore, modelling of projected folic acid intake suggested that mandatory fortification would decrease the inequalities in folic acid intake observed between women from different ethnic groups in this study.



Iodine fortification of salt used in bread has been implemented in New Zealand, but a recent survey of women of childbearing age in Palmerston North reported that iodine levels were suboptimal despite apparently adequate intake in the presence of fortification [123]. Results from an earlier modelling study had suggested that pregnant women would need to take iodine supplements in addition to iodine fortification of bread [178].

Measuring and monitoring to inform intervention

An essential aspect of policy and intervention planning is to measure and monitor the prevalence of determinants and outcomes in the population of interest. This section outlines approaches to measuring and monitoring key aspects of women's and children's health relevant to this topic.

US screening tools and interventions for preconception and/or inter-conception care have recently been summarised in a report for CDC [173]. The authors identified a number of screening tools but noted the lack of rigorous evaluation of these interventions and instruments.

In the US, the Pregnancy Risk Assessment Monitoring System (PRAMS) collects data each year on maternal health and attitudes to health before, during, and shortly after pregnancy. A detailed description of the system can be found on <http://www.cdc.gov/PRAMS/>. PRAMS data can be used to answer specific research questions [111] or to produce surveillance reports [217].

Factors that could be measured at the preconception stage or during pregnancy include dietary patterns [106,114], smoking (measured using self-report or urinary cotinine levels), and alcohol intake, particularly binge drinking [111,147,183]. Kesmodel [147] has reported robust measures of binge drinking in a Danish population using two questions: 1) "Try to think of your entire pregnancy, including the first weeks before you knew you were pregnant. How many times have you been drinking five or more drinks on a single occasion?" and 2) "How many weeks pregnant were you on this/these occasion(s)? These questions require clarification of the timing (which is spelt out in the study design), to avoid previously observed variations in surveys of early pregnancy binge drinking.

For individual women, it is important to identify their pre-pregnancy weight category: underweight (<18.5 kg/m²), normal (18.5–24.9 kg/m²), overweight (25.0–29.9 kg/m²), or obese (30.0 kg/m²) [102], because this determines their recommended weight gain during pregnancy [194].

Birth outcomes that are strongly influenced by preconception and pregnancy factors include fetal or neonatal death, prematurity, and birthweight. Perinatal deaths are collated at national level. Prematurity can be reported as delivery at <37 weeks or as a continuous measure, i.e. gestational age at birth [106]. Birthweight is an important measure that is discussed in detail in the following section.

Birthweight

Like prematurity, birthweight can be reported as a categorical measure, for example labelling infants with a birthweight <2500g as 'low birthweight', or as a continuous measure, e.g. weight in grams.

Lewis notes that "placental transmission or compromised placental function may comprise a small number of mechanisms that interrupt fetal development and therefore result in a similar set of child outcomes... Fetal growth, therefore, could continue to be considered a useful index of fetal adversity but also as an outcome for prenatal and preconception intervention to target, particularly for population-level interventions" [88].

Birthweight is influenced by numerous characteristics aside from the risk factors presented in this chapter. These include maternal factors (age, height, parity, and previous history of low birthweight) and infant factors (sex, gestational age at delivery, and ethnicity) [218,219] as well as a range of health conditions. It is particularly difficult to separate effects on birthweight and effects on gestational age, and new evidence suggests that adjusting for gestational age in analyses can introduce bias [220]. This complexity can make it difficult to use birthweight to assess the effect of an intervention at the individual level, even for



risk factors where there is very strong evidence of an effect on birthweight at the population level.

Smoking is a good example of this problem. Maternal smoking is estimated to reduce birthweight by about 90–170g [141,143], but because of normal variations in birthweight due to the above-mentioned factors and systematic differences between women who continue to smoke in pregnancy and those who do not, it is difficult in practice to demonstrate significantly improved birthweights following changes in smoking, especially among women who reduce consumption without stopping completely [221,222]. Thus, a failure to demonstrate significantly increased birthweights following an intervention does not necessarily mean that the intervention was ineffective. Secker-Walker et al. have published a helpful discussion about how to assess the effect of smoking reduction interventions on birthweight [218].

This problem further emphasises the need for a co-ordinated, programmatic approach rather than a single-issue intervention to improve outcomes for children: even if all smoking were prevented, other risk factors would continue to impact on birth outcomes.

Mental health

Mental health is a complex concept, and unlike birthweight, it is not routinely measured in adults or infants. It has been suggested that routine, universal psychosocial assessment of women during pregnancy may be effective in identifying women at risk and hence, intervening to improve perinatal outcomes. However, a systematic review [200] which identified two such trials was inconclusive; the studies were underpowered and confidence intervals were wide and included the null.

Measurements of child mental health need to take child age into account. Infants and young children can be assessed using the Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood: revised edition (DC:0-3R); an overview can be found in the 'Healthy Beginnings' report [176].

In New Zealand, as the twelfth core contact in the Well Child Tamariki Ora schedule, children undergo the B4 School Check, which includes the Strengths and Difficulties Questionnaire (SDQ) [223]. This instrument is designed to identify children with mental health or development problems who may require additional supports as they start school; it could potentially also be used as an outcome measure of preconception or pregnancy policy at the population level, because the B4 School Check had approximately 90% of the eligible child population checked in 2013/14.

However this measure is limited to identifying problems: despite its name, the SDQ is not designed to measure child strengths. This focus on problems gives an incomplete picture of children's functioning, and does not take into account more positive factors such as resilience in adversity. Given that preconception and pregnancy risk factors are strongly linked to disadvantage, it may be especially important to understand pathways to positive mental health and factors that can protect children born into families experiencing adversity. An alternative measure has been developed in the Australian Early Development Index and is described in the box below.

Case study: Measuring positive child mental health at the population level using the Australian Early Development Index

This study was instigated as a response to the observation that population-level reporting of child mental health focuses almost exclusively on mental health problems. The first step was to develop a definition of positive child mental health, drawing on the public health, psychology and social science literature. The major finding of this investigation was that population mental health researchers should adopt the dual continuum model, in which positive mental health and mental health disorders are seen as separate though correlated states [138]. The conclusions of this study were that concepts and measures of positive child mental health for public health purposes should be based on child strengths (not the absence of difficulties), should be developmentally contextualised, and should have a multilevel perspective, taking into account the complex relationships between children and the societies in which they live [139].



Based on these requirements, a novel indicator, mental health competence, was derived from positive constructs: overall social competence; responsibility and respect; approaches to learning; readiness to explore new things; and prosocial and helping behaviour.

The data source for this indicator is the Australian Early Development Index (AEDI), a three-yearly national census of child development at school entry [224]. It is an adaptation of the Early Development Instrument (EDI), which was originally developed in Canada and has since been rolled out in a number of countries [225].

The mental health competence indicator performed well in validation tests against the Strength and Difficulties Questionnaire. In logistic regression models, maternal education and mental health emerged as strong predictors of child mental health competence that may also protect against the adverse effect of family hardship [226]. Further work is ongoing to report on mental health competence in a full national cohort of Australian children as they started school.

Translating the evidence into action

As this review shows, the effect of preconception and pregnancy health on child health is an area of active research and it is understood that these are extremely important life stages in determining child health. However, this extensive literature does not currently provide a clear mandate for action in the form of a proposed programme of interventions with robust evidence of efficacy and effectiveness.

Nevertheless, although evidence on specific interventions is often inconclusive, some patterns can be discerned. One is the observation that successful interventions tend to be co-ordinated and programmatic rather than addressing a single issue [95,179,187]. Another is that successful trials tend to have a higher level of engagement with their participants than unsuccessful ones: interventions that seek to support behaviour change using counselling and multiple contacts seem to have more effect than interventions simply providing information [180,185,187,197]. Taken together with evidence that risk factors tend to co-associate and influence each other, these patterns suggest that maternal and child health is best regarded as a complex system where the effect of a single intervention is not linear and may be influenced by multiple factors external to the intended focus of the intervention.

This in turn indicates a need to build an explicit recognition of complexity into service and intervention design. FSG (www.fsg.org), a US-based consulting firm, has produced a thoughtful practice brief, 'Evaluating Complexity: Propositions for Improving Practice' [227] based on their experience of working with agencies across all sectors to bring about social change in complex circumstances.

This policy brief outlines nine propositions for evaluating complexity, based on nine characteristics of complex systems identified by the authors. These characteristics include observations that events in one part of the system affect all other parts; that "relationships between entities may be more important than the entities themselves"; that "context matters; it can often make or break an initiative"; and that "each situation is unique; best principles are more likely to be seen than best practices". The authors also emphasise the importance of gathering information about all of these aspects, and in particular, they stress the need to elicit information and then rapidly feed it back into the system so that initiatives are constantly learning and adapting.

This outline of the information demands of a complex system suggests that these demands are not well served by the traditional medical literature model of evaluating single interventions at a single time point (usually after the conclusion of the trial), and of focusing on interventions and outcomes without contextualising this and taking relationships into account. The authors of the practice brief discuss an array of methods and tools that they use for obtaining information and it is notable that these are outside the traditional RCT or quantitative study structure, for example using systems mapping to understand relationships within a complex system, or causal diagrams to understand multiple pathways of effect.

Recently, a similar need for additional and complementary sources of information was identified by health planners in the US as they considered public health strategies for another



very complex problem, obesity. The box below describes the L.E.A.D. framework that was developed in response to this identified need.

Developing an evidence base for a complex system

Even very large and authoritative systematic reviews such as those produced in the Cochrane system are generally commenting on just one aspect of the evidence, the internal validity of the studies, in other words how likely studies are to have measured the true effect of an exposure or intervention on an outcome. What is additionally required and essential to health planning, however, is evidence on external validity: how well study findings can translate into other settings [228]. This is harder to measure and fits less easily into an RCT paradigm [229], but is more suited to the information needs of health planners considering a complex problem.

Case Study: L.E.A.D.

The L.E.A.D. framework was developed in the US by the Institute of Medicine and is described in a recent paper by Chatterji et al. [228]. This is a systems-oriented framework which was originally developed to address obesity and is applicable to many other complex population health problems. The L.E.A.D. acronym stands for 'Locate the evidence, Evaluate the evidence, Assemble the evidence, and inform Decisions' and the framework locates these cyclical steps within a systems perspective, with panels showing that decision-makers may identify a need and opportunity to generate evidence at any step.

The authors describe three types of questions that can be used to guide evidence gathering:

- 1) 'Why' questions e.g. 'Why should we be concerned about preconception health?'
- 2) 'What' questions e.g. 'What actions could be taken to ensure adequate folic acid intake before and during pregnancy?'
- 3) 'How' questions e.g. 'How can this be implemented in the most disadvantaged populations?'

All types of questions are important, but the biggest evidence gaps in this topic are in the 'how' questions.

As an example of how a study that was not RCT-based can provide critical information to guide interventions, a recent paper in the New Zealand Medical Journal "Why Māori women continue to smoke while pregnant" reported on the results of a survey of 60 pregnant Māori women who were smokers [137]. These in-depth interviews provided detailed and specific information about women's beliefs about smoking and their circumstances, and in doing so identified a number of barriers to smoking cessation, including, for example, the observations that women were smoking to self-medicate for stress, and that for all the women interviewed there was at least one other smoker in the household (with a third of the participants agreeing that they might as well continue smoking as they were exposed to so much second-hand smoke). This suggests that a smoking cessation intervention for these women that did not address the stress they are experiencing or that did not encompass all members of a household would have limited success.

This need for practical, local knowledge is summed up by Green and Glasgow who note that "if we want more evidence-based practice, we need more practice-based evidence" [229].

Conclusions

As this review demonstrates, there is a growing understanding that risk factors and behaviours that are present before conception and during pregnancy can influence child health [86].

Major influences on child health that have their effects both in the preconception period and during pregnancy include nutrition at the macro- and micronutrient level, mental health status, and exposure to alcohol, smoking and drugs. Moreover, risk factors commonly co-associate and the presence of one may lead to another. The relationships are complex: unintended pregnancy may both cause and be caused by other health behaviours. An additional problem of unintended pregnancy is that early pregnancy is an especially sensitive period for a number of harmful influences and women may be unaware of pregnancy at this time: this adds weight to recommendations for greater support of preconception health.

Maternal stress during pregnancy is now understood to pose a major risk to child physical and mental wellbeing and the evidence is strong enough to indicate that this should be an intervention priority; there is also evidence that as well as being harmful in itself, maternal stress can be a driver of other harmful behaviours [96].



Consequences of these risks for children include adverse birth outcomes such as stillbirth and prematurity; outcomes that emerge during childhood such as obesity and mental health difficulties [88]; and, it is now increasingly recognised, adult health problems such as diabetes and cardiovascular disease [87]. Low birthweight or small size for gestational age is a finding common to many of these problems although not an outcome in itself [88].

The urgency of addressing these health issues is underlined by emerging evidence from longitudinal cohorts and epigenetics research showing that adverse effects originating in the preconception period can carry through into adulthood and potentially into the next generation [126]. This increasingly detailed evidence of the importance of preconception health signals a need for a new, broader approach to promoting child health. As Mitchell and Verbiest put it: “Ultimately, a key task of the preconception health movement is to change social norms about the importance of the health of women and men and the impact it can have on their future reproductive goals” [93]. As a population health goal, this will be neither easy nor simple to achieve, but the influence on child wellbeing is likely to be profound [196].

Taking action requires a sound evidence base. This is challenging: when evaluating preconception or pregnancy interventions that impact on child health, randomised controlled trials are not always feasible; nor do they always provide the information that is most needed [169], such as specific, local understandings of barriers to intervention uptake and success.

The issue of external validity (how well interventions translate into new settings) is critical for this topic. Most of the risk factors discussed here are already well known to be harmful to human health, and further clarification of risk, even when this has high precision, will add little to our recognition of these as important problems that require action. The challenge is not so much to measure the risks but to address them effectively in the real-life settings in which women live.

The intractability of these problems indicates a need to consider new approaches and solutions. For example, it is clear that knowledge of risk alone is not enough to support health-promoting behaviours or behaviour change in the preconception period [95] or during pregnancy [200]. Similarly, current interventions tend to require intensive investment of resources to be effective [180,185,187,197]. These and other considerations highlight the importance of approaches that can address the complexity of these issues.

Finally, a striking feature of the research literature on preconception and pregnancy health is that it has a very strong focus on risk, with little attention given to strengths and resilience in individuals and communities. This may limit the strategies currently available to healthcare services and professionals.

Dunkel Schetter warns against blaming women for poor health choices, pointing out that “mothers are embedded in multiple layers of influence, including social and cultural contexts containing many complex causal determinants that are often uncontrollable.... Societies that nourish resilience in mothers and their families are surely likely to see maternal optimality” [96]. This resilience might take the form of health literacy [214], positive mental health in mothers [140] and children [139], or the knowledge and support of family and whānau. Indeed, this positive, supportive approach to maternal health is closely aligned with the principles of Whānau Ora [230] suggesting that our communities may already hold the key to supporting a healthy start for the generations to come.



WELL CHILD SERVICES



INTRODUCTION TO WELL CHILD TAMARIKI ORA SERVICES

All New Zealand families and whānau are entitled to the Well Child/Tamariki Ora (WCTO) programme, a package of free health services for children from birth to the age of five years [231]. Most children receive WCTO services from Plunket, but some receive WCTO services from Māori and Pacific non-governmental agencies, DHB-funded providers, or primary health organisations [232].

The services all children are entitled to receive are set out in the Well Child/Tamariki Ora Schedule (on the Ministry of Health website), which describes the surveillance, education and support services that are delivered across a total of 12 core contacts [233]. As well as these 12 core contacts, the Schedule also includes a general practitioner check at six weeks of age, linked to the six-week immunisations, to ensure babies are connected to primary health services. High needs children and families may be allocated additional contacts on the basis of need [233]. The WCTO Schedule divides services into three parallel streams, to be delivered as an integrated package of care. The streams are: health and development assessments, care and support for families and whānau, and health education.

The present WCTO framework is the result of an extensive review of the previous framework, involving consultation with key stakeholders and a literature review. The review led to WCTO services having a greater focus on social and emotional developmental stages (in addition to physical developmental stages), a greater emphasis on psychosocial factors that can affect children's wellbeing, more proactive approaches to promotion of attachment and prevention of behavioural problems, and an increased focus on identification of, and response to, individual family and whānau needs [234]. In addition, the present framework: includes evidence-based assessment tools to support care planning; encourages better coordination between WCTO practitioners/providers, lead maternity carers, general practice, specialist health services, and education and social services; promotes better use of information collected antenatally to improve postnatal care; and has an increased focus on monitoring and quality improvement.

The following sections review the immunisation coverage of children, the number of visits received by new babies enrolled with Plunket, and children participating in the B4 School Check.



IMMUNISATION COVERAGE

Introduction

Immunisation is the process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine [235]. Vaccines mimic disease-causing micro-organisms and stimulate the body's immune system to produce T-lymphocytes and antibodies which provide protection against future encounters with these viruses or bacteria and thus prevent disease [236]. When a high proportion of a population is protected against a particular disease-causing virus or bacterium it is difficult for the associated disease to spread through the population because there are so few susceptible people left to infect. In such a population even non-vaccinated individuals receive a measure of protection. This phenomenon is known as "herd immunity" [237].

The 20th Century saw dramatic declines in vaccine-preventable diseases worldwide and vaccination has been identified as a cost-efficient means of reducing inequities in health [238,239]. Since 2005, the National Immunisation Register has provided data for monitoring immunisation coverage in New Zealand [240]. Immunisation rates have improved in recent years [241]. In the second quarter of the 2013/14 primary health care targets, 92% of eight month olds enrolled in a PHO were fully immunised [242] compared to 2005–2007 when 85% of all eligible children were fully immunised at 12 months [243]. Further increases in immunisation rates are likely to be beneficial; for instance, measles is considered to be eradicable if immunisation rates exceed 95% [244].

Immunisation uptake has been lower in populations living in more deprived areas in New Zealand, as is the case in other countries [243]. The "deprivation gradient" in immunisation rates has also been more pronounced for Māori and Pacific children [243]. Increasing immunisation coverage and timeliness continues to be a Ministry of Health target. The current target is that by December 2014, 95 percent of eight-months-olds will have had their primary course of immunisation (six weeks, three months and five months immunisation events) [245].

The following section provides a brief overview of New Zealand's current immunisation schedule, along with a summary of recent changes.

New Zealand's Current Immunisation Schedule

The New Zealand Immunisation Schedule offers publicly funded vaccination for eleven vaccine preventable diseases: diphtheria, tetanus, pertussis, poliomyelitis, hepatitis B, *Haemophilus influenzae* type b, measles, mumps, rubella, pneumococcal disease and rotavirus, to children aged between six weeks and 11 years (**Table 30**) [246]. Human papillomavirus (HPV) vaccination is offered to girls aged 12 years. Additional publicly funded vaccinations for hepatitis A, influenza, meningococcal A, C, W135 and Y, varicella (chickenpox), and tuberculosis (BCG vaccination) are offered to those at risk.

The Ministry of Health has recently published a new Immunisation Schedule that details the changes made to timing or type of immunisation [246,247]. All children transfer to the new Schedule from 1 July 2014. The rotavirus vaccine and the 13-valent pneumococcal vaccine are new additions. The text box below provides a brief overview of these two additions.



Table 30. The National Immunisation Schedule for babies, children, and adolescents

Age	Antigen	Vaccine Brand Name
6 weeks	Diphtheria/tetanus/acellular pertussis/inactivated polio vaccine/hepatitis B/ <i>Haemophilus influenzae</i> type b	1 injection (INFANRIX-hexa®)
	13-valent pneumococcal conjugate	1 injection (Prevenar 13®)
	Pentavalent rotavirus vaccine (an oral vaccine)	1 dose RotaTeq®
3 months	Diphtheria/tetanus/acellular pertussis/inactivated polio vaccine/hepatitis B/ <i>Haemophilus influenzae</i> type b	1 injection (INFANRIX-hexa®)
	13-valent pneumococcal conjugate	1 injection (Prevenar 13®)
	Pentavalent rotavirus vaccine (an oral vaccine)	1 dose RotaTeq®
5 months	Diphtheria/tetanus/acellular pertussis/inactivated polio vaccine/hepatitis B/ <i>Haemophilus influenzae</i> type b	1 injection (INFANRIX-hexa®)
	13-valent pneumococcal conjugate	1 injection (Prevenar 13®)
	Pentavalent rotavirus vaccine (oral vaccine)	1 dose RotaTeq®
15 months	<i>Haemophilus influenzae</i> type b	1 injection (Act-HIB®)
	measles/mumps/rubella	1 injection (M-M-R II®)
	13-valent pneumococcal conjugate	1 injection (Prevenar 13®)
4 years	Diphtheria/tetanus/acellular pertussis/inactivated polio vaccine	1 injection (INFANRIX-IPV®)
	Measles/mumps/rubella	1 injection (M-M-R II®)
11 years	Diphtheria/tetanus/acellular pertussis	1 injection (BOOSTRIX®)
12 years girls only	Human papillomavirus	3 injections given over 6 months (GARDASIL®)

Source: Ministry of Health, New Zealand Immunisation Schedule [246]

Recent changes to the New Zealand Immunisation Schedule

Rotavirus vaccination has been added to the schedule from 1 July 2014. Rotavirus is ubiquitous in the community and all children are likely to be infected before the age of five years. Rotavirus infection causes gastroenteritis (diarrhoea and vomiting). The resulting dehydration can lead to infants being admitted to hospital. The peak incidence of rotavirus gastroenteritis is between 6 and 24 months of age [248]. The rotavirus vaccine used in New Zealand, RotaTeq®, is a live oral vaccine containing five human-bovine rotavirus reassortants: G1, G2, G3, G4 and P1A [242,248].

The 2012 Cochrane review assessing vaccines for preventing rotavirus diarrhoea reported on 12 RCTs of RotaTeq® [249]. It found that in children aged less than one year living in countries with low mortality rates, RotaTeq® probably prevented 87% of severe rotavirus diarrhoea cases (relative risk 0.13, 95% CI 0.04–0.45). This finding was based on moderate quality evidence from three trials with a total of 2344 participants. One trial from Finland, with 1029 participants, provided low quality evidence that the vaccine may prevent 72% of severe all-cause diarrhoea cases: (RR 0.28, 95% CI 0.16–0.48). Three other trials conducted in low-mortality countries, with a total of 3190 participants, reported on severe rotavirus diarrhoea in the two years after vaccination. These trials provided moderate quality evidence that RotaTeq® probably prevented 82% of severe rotavirus diarrhoea cases (RR 0.18, 95% CI 0.07–0.50). In addition, the trial from Finland provided low quality evidence that, in the two years after vaccination, the vaccine may prevent 96% of all-cause severe diarrhoea: (RR 0.04, 95% CI 0.00–0.70). There was no evidence that the vaccine affected mortality rates, but since death from rotavirus infection is very rare in developed countries, the trials were underpowered to detect an effect on this end point. Following vaccination with RotaTeq® there were adverse events reported in 1884 out of 78,226 children. Thirty-four cases of intussusception were reported in 81,459 children. (Intussusception is a serious adverse event which involves part of the intestine being pulled in on itself. This can result in blockage of the intestine and loss of blood supply to part of the intestine causing it to die.) There was no significant difference in intussusception rates between children receiving RotaTeq®, Rotarix (the other vaccine brand) and placebo.



Since 2006, many countries have included rotavirus vaccination in their vaccination schedules. Studies in high income countries have found that, following the introduction of the pentavalent vaccine, there was a 89–100% reduction in rotavirus emergency department visits or hospitalisations in children under five years of age [250]. A study which investigated rates of intussusception following the introduction of rotavirus vaccination in Australia, where both brands of the vaccine are used in different states, found a statistically significantly increased risk of intussusception in the seven days after the first, and to a lesser extent, the second, vaccine doses. The magnitude of increased risk was similar for both vaccines. The study authors estimated that the introduction of the vaccine had resulted in 14 extra cases of intussusception and more than 6,500 fewer gastroenteritis hospitalisations in young children in Australia each year [251].

The 13-valent pneumococcal vaccine (Prevenar 13®, PCV13) replaced the 10-valent vaccine for all children in July 2014 [246]. The first pneumococcal vaccine in the immunisation schedule was Prevnar-7® (PCV7), introduced in June 2008. It was replaced by the 10-valent vaccine Synflorix® in July 2011. Invasive pneumococcal disease (IPD) has been notifiable since 2008 and notification data is reported on by the ESR [252].

The latest ESR report indicates that the rate of IPD in infants under two years of age has decreased by 64% since the introduction of PCV7 from an average incidence of 100.3 cases per 100,000 population per year in 2006/07 to 35.9 per 100,000 per year in 2012. Cases of IPD caused by PCV7 serotypes in 0–2 year olds decreased by 98%, from an average of 83.1 per 100,000 in 2006/2007 to 1.6 per 100,000 in 2012. There were also significant reductions in both all IPD and PCV7 IPD cases in the 2–4 years age group. Rates of PCV7 IPD, but not all-cause IPD, decreased in the 5–64 years and the 65+ years age groups indicating a herd immunity effect. Rates of IPD for Māori have been about 3 times, and for Pacific peoples about 4 times the European rate. Since 2009, in the <2 years age group, IPD rates have decreased significantly for Māori, decreased, but not significantly, for Europeans and increased, but not significantly, for Pacific peoples. Reductions in incidence of both all IPD and IPD due to the pneumococcal serotypes that are additional in the PCV13 vaccine have been reported in the U.S., the U.K, Denmark, Germany, Greece and Spain [253]. A study of admission rates for all lower respiratory infections in Counties Manukau following the introduction of PCV7 in June 2008 found that pneumonia admissions in children <2 years decreased significantly after the introduction of the vaccine (incidence risk ratio (IRR) 1.51; 95% CI 1.08–1.77), additional to the gradual decline that had been occurring since 2001. There was significant decline for Pacific children (IRR 1.70; 95% CI 1.39–2.07) but not for Māori children (IRR 1.05; 95% CI 0.78–1.40) [254].

Immunisation Coverage Rates

The following section uses the National Immunisation Register to review immunisation coverage rates for children at 6, 8, 12, 18, and 24 months, and 5 years of age.

Data Source and Methods

Indicator

Proportion of children fully immunised at 6, 8, 12, 18, and 24 months, and 5 years of age

Numerator: National Immunisation Register (NIR): The number of children who turned the milestone age during the reporting period and who had completed their age appropriate immunisations by the time they turned that milestone age.

Denominator: NIR: The number of children who turned the milestone age during the reporting period.

Notes on Interpretation

During pregnancy and after birth, parents are informed about the NIR, with Lead Maternity Carers playing a key role in information provision. Following delivery, all of the relevant information about each child is added to the NIR, with parents being able to 'opt off' having their child's immunisation information stored in the NIR. In this case the child's National Health Index number, date of birth, District Health Board and any immunisations already recorded in the NIR are retained, so that immunisation coverage can be accurately calculated. Parents may also choose not to immunise their children and this is recorded on the NIR as a declined immunisation event to prevent recalls.

The NIR was implemented by the Ministry of Health and District Health Boards in 2005. The rollout occurred in a staged fashion commencing with the Greater Auckland region in April 2005 and finishing in Nelson Marlborough in December 2005. Thus only children born from 2005 onwards have their details recorded in the NIR. However, all children immunised with the MeNZB vaccine as part of the Meningococcal B Immunisation Programme had their details recorded in the NIR, along with any other immunisations given at the same time (although no further vaccinations are recorded on the NIR for these older children). For further details on the NIR see <http://www.health.govt.nz/our-work/preventative-health-wellness/immunisation/national-immunisation-register/questions-and-answers-national-immunisation-register>.



New Zealand Distribution and Trends

Distribution by Milestone Age

In New Zealand during 2009 to 2014 (years ending 30 June), the immunisation coverage rates were highest for children aged 12 and 24 months. The coverage rates were lowest for children aged 6 months. Immunisation coverage rates, however, increased for all age groups during this period.

The immunisation health targets were expanded in 2012/13 to include completion of primary course of immunisation by 8 months. For the year ended June 2013, the immunisation coverage rates for children aged 8 months was 88.7% and increased to 90.8% for the year ended June 2014. (**Figure 94**).

Distribution by Ethnicity

In New Zealand during the year ending June 2014, the immunisation coverage rates increased for all ethnic groups. The immunisation coverage rates during this period were highest for Asian and Pacific children aged 12 and 24 months, followed by European children, with rates being the lowest for Māori children (**Figure 95**).

The immunisation coverage rates were highest for Asian children aged 8 months, followed by Pacific and European children. The lowest rates at 8 months were for Māori children (**Figure 97**).

Distribution by NZ Deprivation Index Decile

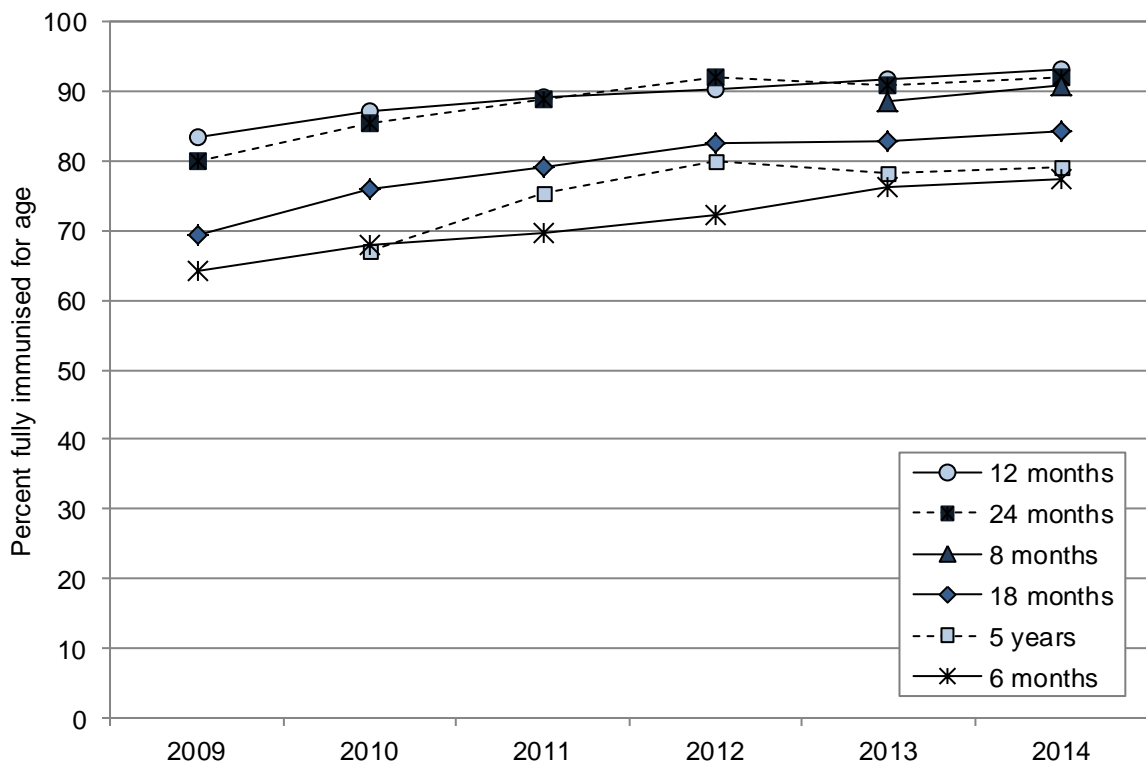
In New Zealand for the years ending June 2009 to 2014, the immunisation coverage rates among children across the deprivation quintiles increased (**Figure 96**).

The coverage rates at 24 months were higher for children from the least deprived (NZDep deciles 1–2) than those in average deciles (NZDep deciles 5–6) and all were higher than the most deprived areas (NZDep deciles 9–10) until the year ended June 2011. The socioeconomic gradients lessened after this so that by June 2014, coverage rates were very similar for children from the most and the least deprived areas (**Figure 97**).

During the quarters ending March 2013 to June 2014 the immunisation coverage rate at 8 months remained highest for children from the least deprived areas (NZDep deciles 1–2) compared to the average (NZDep deciles 5–6) and rates were higher than those for the most deprived areas (NZDep deciles 9–10) (**Figure 97**). By the year ended 30 June 2014, immunisation coverage at 8 months was 92.3% for children from the least deprived areas (NZDep deciles 1–2), 91.5% for children from average areas (NZDep deciles 5–6), and 88.7% for children from the most deprived areas (NZDep deciles 9–10) (**Figure 96**).

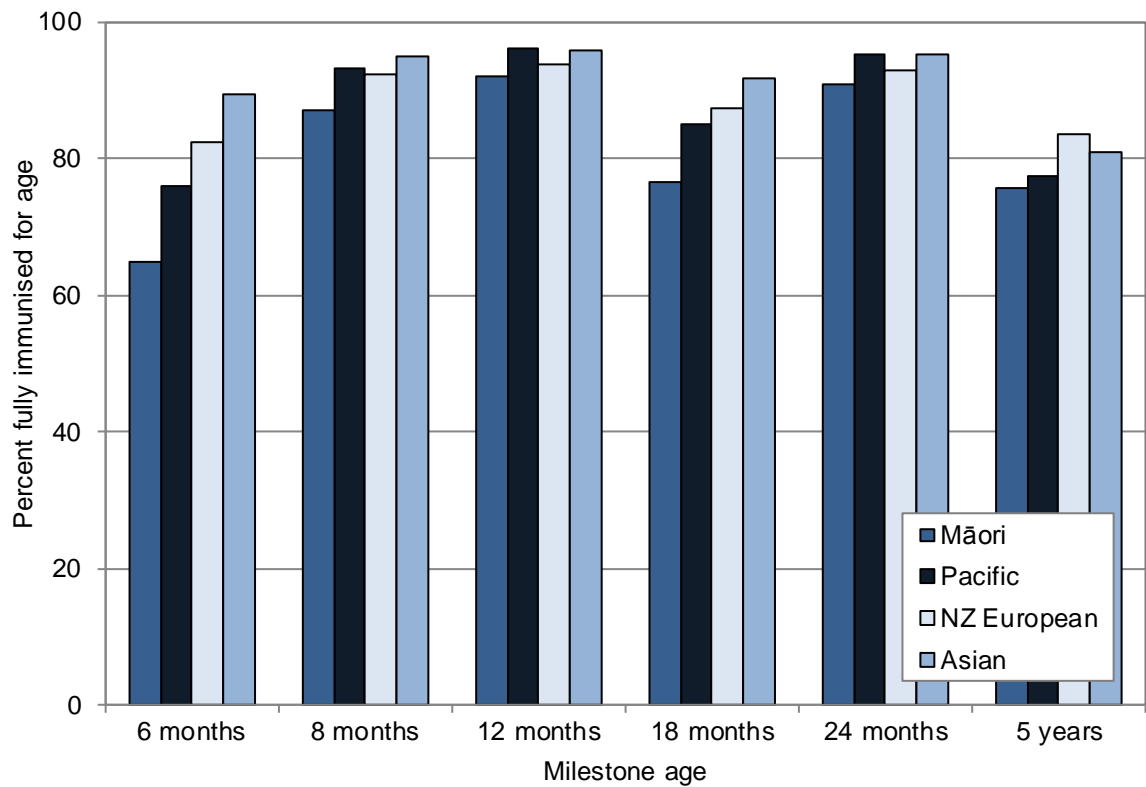


Figure 94. Immunisation coverage by milestone age New Zealand, years ended 30 June 2009–2014



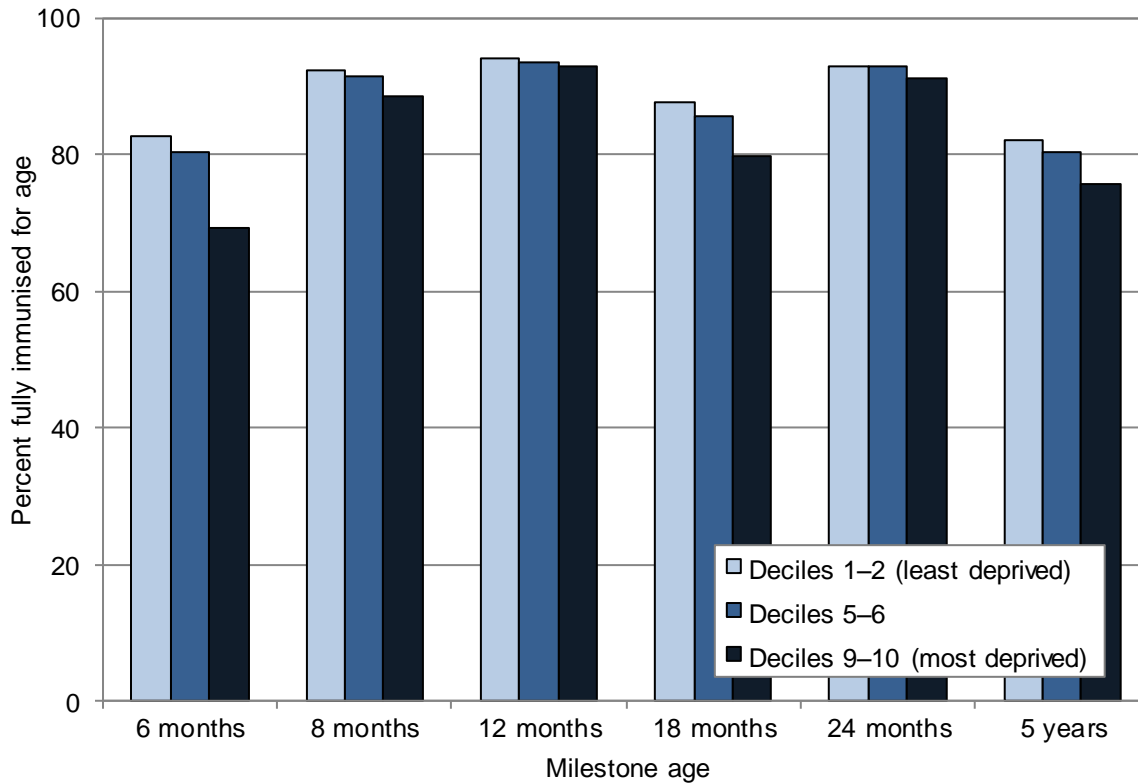
Source: National Immunisation Register

Figure 95. Immunisation coverage by milestone age and ethnicity New Zealand, year ended 30 June 2014



Source: National Immunisation Register

Figure 96. Immunisation coverage by milestone age and NZ Deprivation Index decile, New Zealand year ended 30 June 2014



Source: National Immunisation Register; Note: NZ Deprivation Index is Dep 06

Northern DHBs Distribution and Trends

Distribution by Milestone Age

In Northland during 2009 to 2014 (years ending 30 June), while immunisation coverage increased, rates at each milestone age were lower than the New Zealand rate. However, in the Waitemata DHB coverage rates were very similar to the New Zealand rate (**Figure 98, Figure 100**).

In the Auckland and Counties Manukau DHBs, while coverage at 8 months was very similar to the New Zealand rate, DHB vs. NZ differences at other ages were more variable (**Figure 99, Figure 100**).

Distribution by Ethnicity

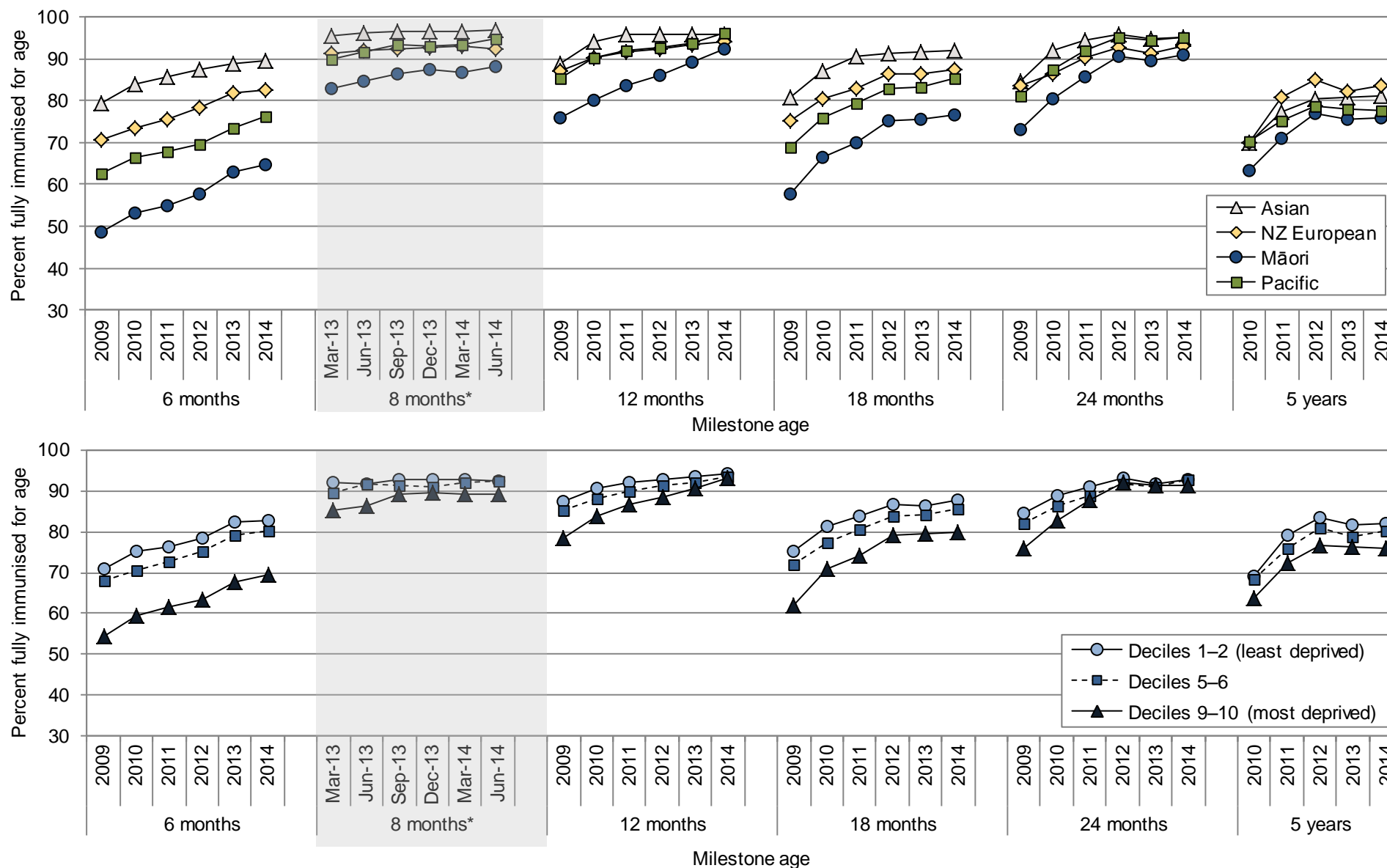
In the Waitemata, Auckland and Counties Manukau DHBs during the quarters ending March 2013 to June 2014, immunisation coverage rates at 8 months were generally higher for Asian > European and Pacific > Māori infants. In Northland however, coverage rates at 8 months were similar for Māori and European infants (**Figure 101**).

Distribution by NZ Deprivation Index Decile

In the Northern DHBs during the quarters ending March 2013 to June 2014, there were no consistent socioeconomic differences (as measured by NZDep Index decile) in immunisation coverage rates at 8 months of age, although coverage for Auckland and Counties Manukau infants living in the most deprived areas (NZDep deciles 9–10) were lower than for infants from other areas for parts of this period (**Figure 102**).

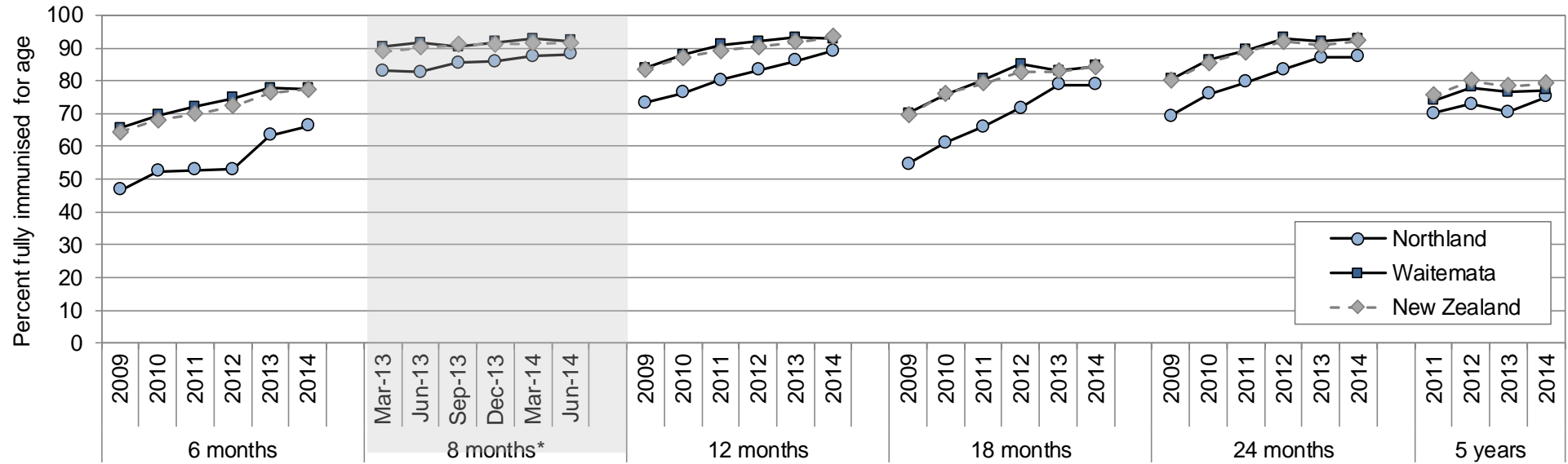


Figure 97. Immunisation coverage by milestone age, ethnicity and NZ Deprivation Index decile, New Zealand years ended June 2009–2014



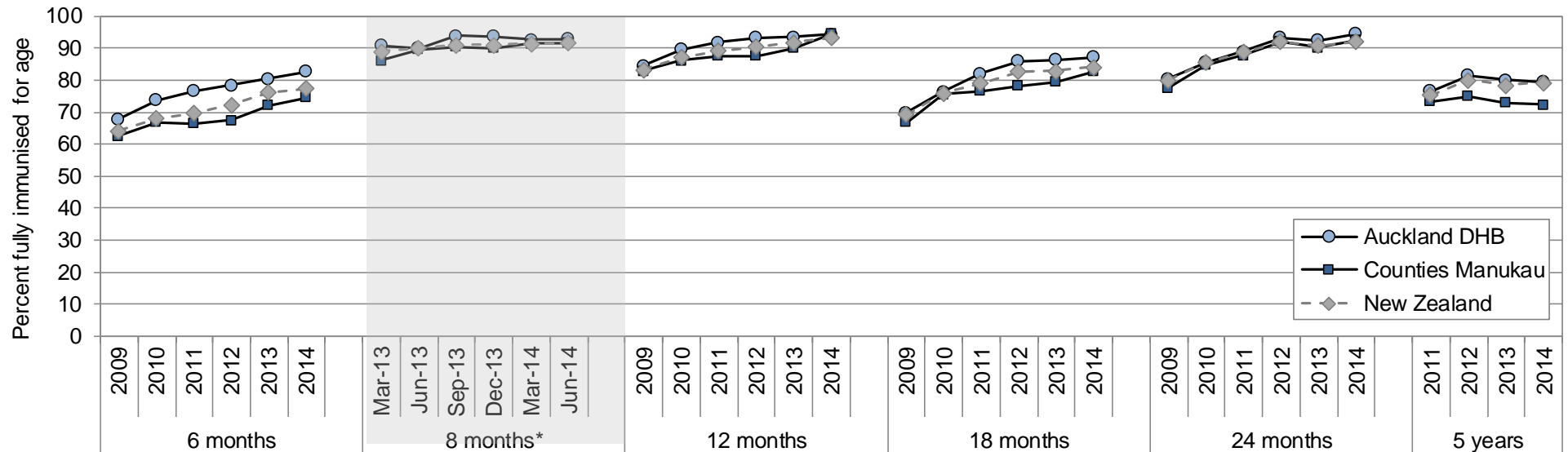
Source: National Immunisation Register; Note: Ethnicity is level 1 prioritised; NZ Deprivation Index is Dep 06; *Immunisation coverage at milestone age of 8 months was first reported for the quarter ended March 2013

Figure 98. Immunisation coverage by milestone age, Northland and Waitemata DHBs vs. New Zealand years ended June 2009–2014



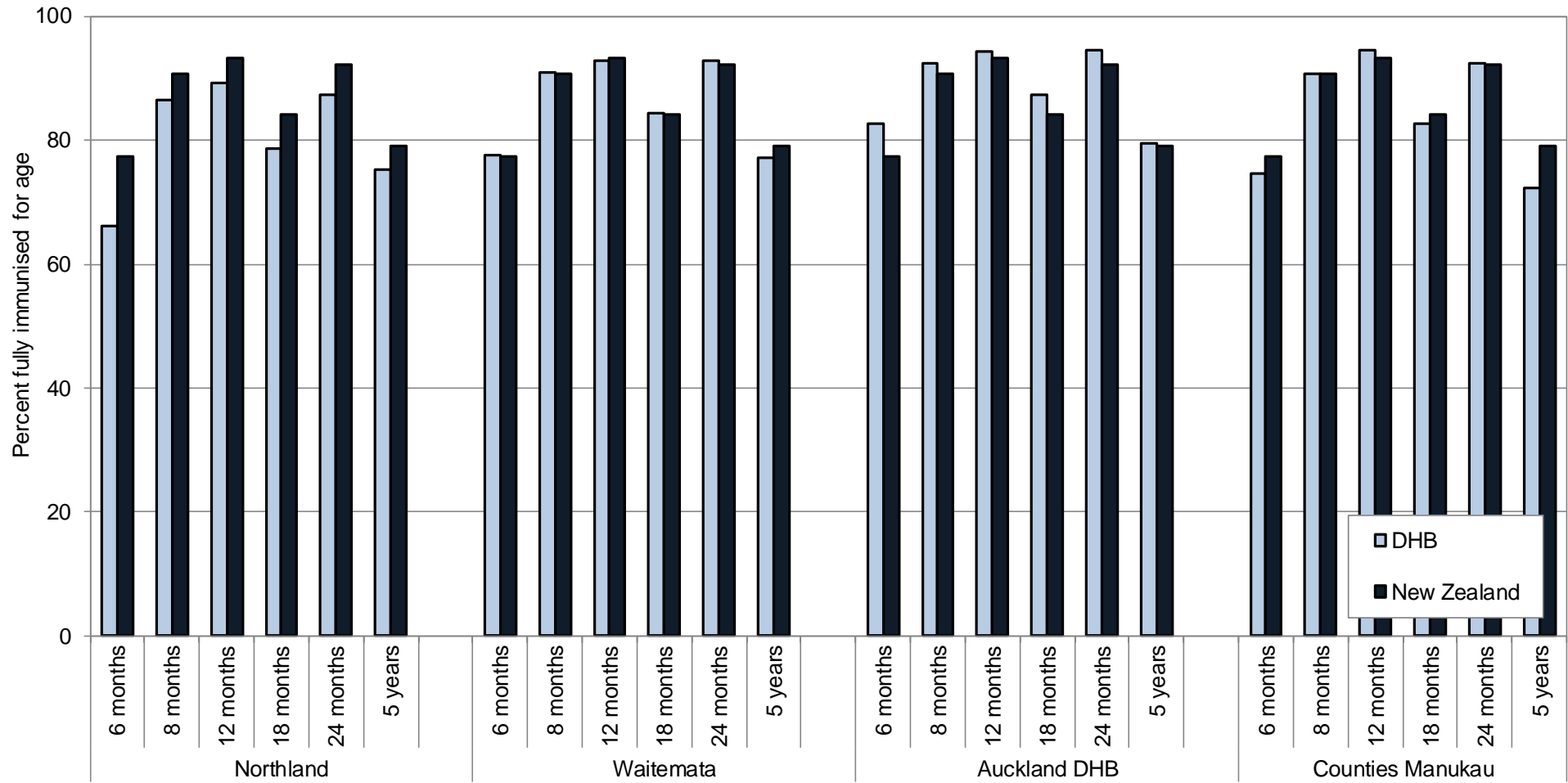
Source: National Immunisation Register; Note: *Immunisation coverage at milestone age of 8 months was first reported for the quarter ended March 2013

Figure 99. Immunisation coverage by milestone age, Auckland and Counties Manukau DHBs vs. New Zealand, year ended 30 June 2014



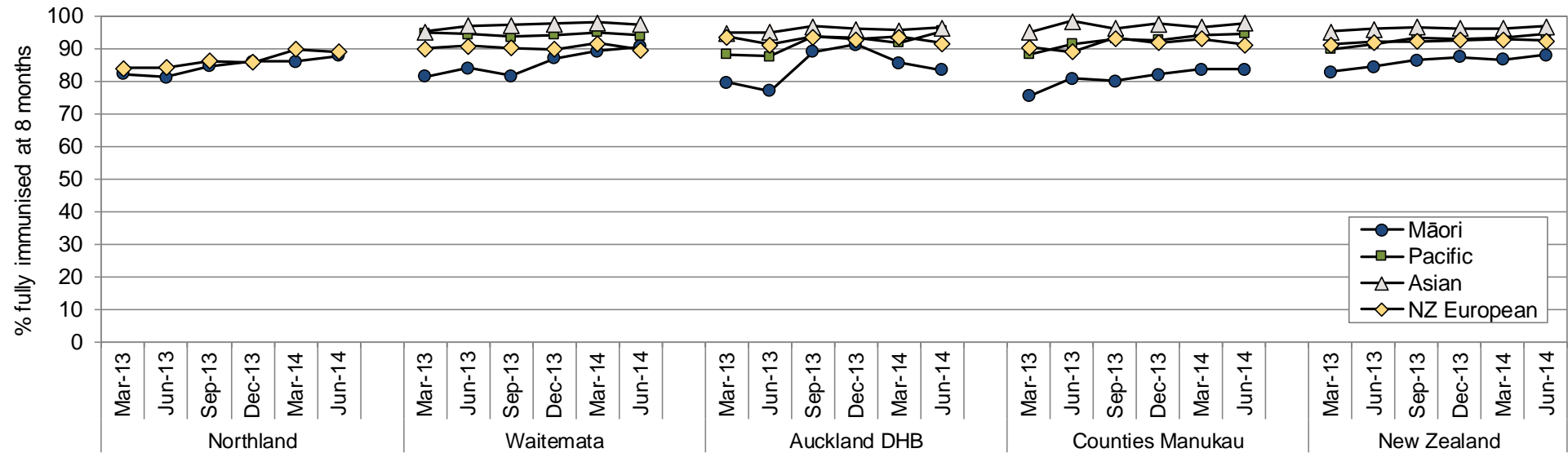
Source: National Immunisation Register

Figure 100. Immunisation coverage by milestone age, Northern DHBs vs. New Zealand, year ended 30 June 2014



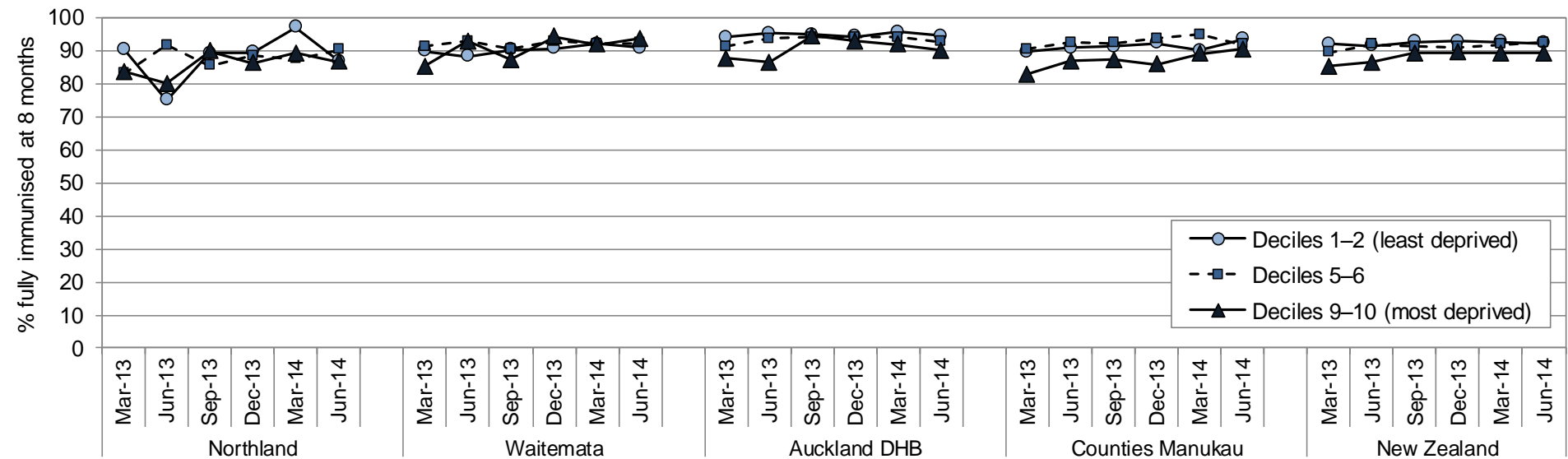
Source: National Immunisation Register

Figure 101. Immunisation coverage at eight months by ethnicity, Northern DHBs vs. New Zealand for the quarters ended March 2013 to June 2014



Source: National Immunisation Register; Note: Ethnicity is prioritised; Immunisation coverage at milestone age of 8 months was first reported for the quarter ended March 2013

Figure 102. Immunisation coverage at eight months by NZ Deprivation Index decile, Northern DHBs vs. New Zealand for the quarters ended March 2013 to June 2014



Source: National Immunisation Register; Note: NZ Deprivation Index is NZDep 06

Local Policy Documents and Evidence-based Reviews Relevant to Immunisation and Increasing Immunisation Coverage

Table 31 below provides a brief overview of local policy documents and evidence based reviews which consider immunisation and interventions aimed at increasing immunisation coverage.

Table 31. Local policy documents and evidence-based reviews relevant to immunisation and increasing immunisation coverage

Ministry of Health publications
<p>Ministry of Health. 2012. National Guidelines for Vaccine Storage and Distribution. Wellington: Ministry of Health. http://www.health.govt.nz/publication/national-guidelines-vaccine-storage-and-distribution-2012</p> <p>From the place of manufacture to the point of administration, vaccines must be kept within the temperature range +2°C to +8°C. The system for achieving this is known as the “cold chain”. These guidelines are intended to ensure that everyone who handles vaccines is aware of their responsibilities for maintaining the cold chain to maximise the effectiveness of the immunisation programme.</p>
<p>Ministry of Health. 2012. Annual Cold Chain Management Guide and Record. Wellington: Ministry of Health. http://www.health.govt.nz/publication/annual-cold-chain-management-guide-and-record</p> <p>This guide is a quality tool to support immunisation providers in achieving cold chain accreditation. It enables immunisation providers to</p> <ul style="list-style-type: none"> • record vaccine refrigerature temperatures • use the trouble shooting tips for cold chain problems • self-audit vaccine handling and storage.
<p>Ministry of Health. 2011. Immunisation Handbook 2011. Wellington: Ministry of Health. http://www.health.govt.nz/publication/immunisation-handbook-2011</p> <p>The Immunisation Handbook provides clinical guidance for health professionals on the effective and safe use of vaccines. The Handbook contains information on eligibility for vaccines and the diseases covered by the National Immunisation Schedule, as well as on other vaccine preventable diseases.</p>
<p>Ministry of Health. 2011. Targeting Immunisation: increased immunisation. Wellington: Ministry of Health. http://www.health.govt.nz/system/files/documents/publications/targeting-immunisation-health-target.pdf</p> <p>Increased immunisation has been a national health target since 2007. The 2014 immunisation target (available at: http://www.health.govt.nz/new-zealand-health-system/health-targets/about-health-targets/health-targets-increased-immunisation) is that 90% of eight-month-olds will have had their primary course of immunisation at six weeks, three months and five months on time by July 2014, increasing to 95% by December 2014.</p> <p>This report provides a summary of the reasons behind this target, including improvements in child health and reductions in ethnic inequalities in health, and a series of case studies illustrating best practice in increasing immunisation uptake. Three recommendations are identified:</p> <ul style="list-style-type: none"> • All children should be enrolled with a general practice as soon as possible after birth. • Parents should be contacted before each immunisation is due • Immunisation appointments should be made at a time that suits the parents.
<p>Ministry of Health. Review of Neonatal BCG Immunisation Services in New Zealand. 2007, Ministry of Health: Wellington. http://www.health.govt.nz/publication/review-neonatal-bcg-immunisation-services-new-zealand</p> <p>This review evaluated the neonatal BCG immunisation programme. Its objectives were: to describe the neonatal BCG immunisation services; review tuberculosis (TB) surveillance data and service monitoring; identify any imbalance between current policy and services; and make recommendations on the future monitoring of the service. The incidence of TB over the previous 20 years was found to be stable although increasing rates had been identified in immigrants and refugees from high-risk Asian and African countries, and recent arrivals from Pacific countries and their contacts. A survey of all 21 DHBs indicated a wide variability in how the service was offered in New Zealand. Monitoring was patchy and only a few DHBs collected data on the number of TB risk assessments performed on babies, meaning that coverage rates could not be calculated because the total number of eligible babies was unknown. Three priorities for improving the effectiveness of service were identified: to institute a systematic approach to delivering the BCG immunisation service in all DHBs; to improve the quality of the monitoring of the BCG immunisation service; and to improve the completeness of notification data. The review made a number of recommendations in the areas of contracts, monitoring, new resources and surveillance.</p>

International guidelines

Taddio A, Appleton M, Bortolussi R, et al. 2010. **Reducing the pain of childhood vaccination: an evidence-based clinical practice guideline**. *Cmaj*, 182(18), E843–55. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3001531/>

This Canadian guideline offers practical recommendations backed up by an evidence base derived from systematic reviews of the literature. It relates to the immediate pain and distress occurring at the time of vaccination, not any delayed-onset pain occurring in the hours or days after vaccination. The guideline addresses 18 clinical questions related to vaccination and it provides evidence-based answers for fourteen of them. The questions that had an evidence base to provide definitive recommendations relate to breastfeeding during the procedure, the use of sweet tasting solutions, brand of vaccine, position of child, injection techniques, order of injections, tactile stimulation, parent led distraction and coaching, topical anaesthetics, clinician-led distraction, child-led distraction, breathing techniques, combined psychological interventions, and telling the child “it won’t hurt”. The questions for which there was insufficient evidence related to skin cooling techniques, using two providers to give two injections simultaneously at different sites, intramuscular vs. subcutaneous administration of a vaccine when either is acceptable, and oral ibuprofen or acetaminophen (paracetamol) given before injections. The guideline authors note that the practice of giving acetaminophen before vaccination has been questioned as there is some data indicating that it may interfere with the immunogenicity of some childhood vaccines.

Evidence-based medicine reviews

Fu LY, Bonhomme L-A, Cooper SC, et al. 2014. **Educational interventions to increase HPV vaccination acceptance: A systematic review**. *Vaccine*, 32(17), 1901–20.

The authors of this review identified 33 English language studies of HPV vaccination educational interventions for both young women and their parents. The studies were of various designs: RCTs (25 studies), non-randomised trials and quasi-experimental (comparing pre and post intervention outcomes). Eight studies tested the effectiveness of interventions with adolescents or young adults and seven with parents. Eighteen compared the effectiveness of different message frames in interventions (e.g. comparing “advantages of getting the vaccine” with “disadvantages of not getting it” or “preventing cervical cancer” with “preventing genital warts” or “message delivery by peers” with “message delivery by medical experts”) with either adolescents, young adults or their parents. The authors judged that seven studies were at low risk of bias, 15 at medium risk and 11 at high risk. Most of the studies had methodological deficiencies and most did not have receipt of HPV vaccination as the primary outcome measure but rather intention to receive HPV vaccination or attitude towards HPV vaccination. The review authors concluded that there was not strong evidence to recommend any one specific educational intervention. They noted that most studies had used written informational hand-outs aimed at educated populations and they stated that further research should include interventions for less literate or culturally diverse populations since HPV infection disproportionately affects minority and socioeconomically disadvantaged women.

Sadaf A, Richards JL, Glanz J, et al. 2013. **A systematic review of interventions for reducing parental vaccine refusal and vaccine hesitancy**. *Vaccine*, 31(40), 4293–304.

Parents may choose not to immunise their children for various reasons: they may believe that vaccines are dangerous, or that they can control their child’s susceptibility to disease, they may distrust modern medicine, or cite religious grounds for vaccine refusal. Research on cognitive decision making has indicated that parents prefer to make “errors of omission” (such as letting their child their child get sick because of not being vaccinated) to “errors of commission” (e.g. being responsible for their child having an adverse reaction to vaccination). This review aimed to assess the effectiveness of interventions to address parental vaccine refusal. This review included 33 studies, 25 of which were from the U.S. where vaccination is mandatory for entry to school and childcare. (There are variations between states in which vaccines are mandatory. Exemptions are allowed for medical reasons in all states and for religious reasons in most states. Some states allow personal beliefs/philosophical exemptions.)

There were 13 before and after intervention studies, 3 RCTs, 7 non-RCTs, and 6 evaluation studies. Four studies evaluated the results of introducing state-level philosophical or personal belief exemptions for school immunization requirements and three studies evaluated the results of varying the complexity of state-level procedures for obtaining exemptions on nonmedical exemption rates. The most commonly studied intervention was parent-centred education or information. Seventeen studies (including 2 RCTs) tested written educational information. Other interventions included: outreach by immunisation coordinator, parent meeting, ‘Radionovela’, Powerpoint presentations and a web-based decision aid for parents. Fifteen studies of educational interventions measured parents’ attitudes to vaccination as the outcome and eight of them reported a statistically significant improvement. Of the ten studies evaluating educational interventions and using parents’ intention to vaccinate their children as the outcome measure, five reported a statistically significant positive effect on intention. The review authors considered that the overall quality of the studies investigating education/information interventions was poor. They assigned the 2 RCTs a final GRADE evidence score of 2 (out of a possible 8). They concluded that their review had not revealed any convincing evidence regarding effective interventions to address parental vaccine hesitancy and refusal. They stated that “there is a need for randomized trials on cost-effective interventions with outcomes that are measured in terms of the impact on vaccination rates among refusing parents”.

Kaufman J, Synnot A, Ryan R, et al. 2013. **Face to face interventions for informing or educating parents about early childhood vaccination.** Cochrane Database of Systematic Reviews, 5.
<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD010038.pub2/abstract>

This review aimed to assess the effects of face to face interventions for educating or informing parents about early childhood vaccination on immunisation uptake and parental knowledge. It included six RCTs and one cluster RCT, involving 2978 participants in total. The cluster RCT did not contribute usable data to the review. The interventions were delivered in the clinic or hospital, in the mother's home or at antenatal classes. The six RCTs compared face to face intervention with individuals vs. control and the cluster RCT compared face to face intervention with groups of parents vs. control. Six studies measured immunisation status as an outcome but in two of them it was not possible to isolate the effect of the face to face intervention from the effects of other components of the intervention. Three studies measured parental knowledge or understanding of vaccination. The quality of the evidence for each outcome was considered to be low or very low, with moderate risk of bias overall, and the study results were inconsistent. The review authors concluded that the limited available evidence was of low quality and suggested that face to face interventions have little or no effect on immunisation status, or knowledge or understanding of immunisation. They also found no evidence to allow them to comment on the cost of such interventions, parent intention to vaccinate, parent experience of vaccination or adverse effects of vaccination.

Hendry M, Lewis R, Clements A, et al. 2013. **"HPV? Never heard of it!": A systematic review of girls' and parents' information needs, views and preferences about human papillomavirus vaccination.** *Vaccine*, 31(45), 5152–67.

This review included 28 qualitative studies and 44 surveys exploring girls and parents' information needs, views and preferences regarding HPV vaccination. The authors considered that all but one of the qualitative studies were of good to moderately good standard but that only about one third of the surveys had been well conducted. Only five surveys had a sample size > 600 participants and a response rate of >70%. The main findings of the review were as follows. Overall the acceptability of HPV vaccination was high but people had insufficient knowledge and understanding of HPV. The link between HPV, cancer and sexually transmitted infection was not well understood by the girls or their parents. This lack of knowledge hampered their ability to weigh up the risks and benefits of vaccination and make an informed choice. Some people erroneously thought that HPV vaccination replaced cervical screening. Parents were afraid that vaccination might encourage their daughters into early and/or promiscuous sexual activity. Mothers were worried about vaccine safety and girls were worried about the size of the needle. These factors are likely to affect uptake of HPV vaccination and could affect future uptake of cervical screening.

Uman LS, Birnie KA, Noel M, et al. 2013. **Psychological interventions for needle-related procedural pain and distress in children and adolescents.** Cochrane Database of Systematic Reviews (10).
<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD005179.pub3/abstract>

This updated review included 39 RCTs involving 3394 children between the ages of two and 19 years. The most common needle-related procedures in the studies included venepuncture, intravenous line insertion and immunisation. The psychological interventions to reduce pain included distraction, hypnosis and cognitive behavioural theory (CBT). Nineteen studies examined distraction only (e.g. music, toys, books, watching cartoons or playing games). Six studies investigated hypnosis. There was strong evidence supporting the efficacy of both distraction and hypnosis. The review authors found no evidence to support the efficacy of preparation and/or information, combined CBT, parent coaching plus distraction, suggestion or virtual reality. They reported that more research is needed on the following interventions which had been the subject of only one RCT each: memory alteration, parent positioning plus distraction, blowing out air, and distraction plus suggestion. They stated that: "There are continuing issues with the quality of trials examining psychological interventions for needle-related pain and distress".

Kassab M, Foster JP, Foureur M, et al. 2013. **Sweet-tasting solutions for needle-related procedural pain in infants one month to one year of age.** Cochrane Database of Systematic Reviews (2).
<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD008411.pub2/abstract>

This review included 14 RCTs involving 1551 participants. Compared to infants who received water, infants who received a sweet-tasting solution had a significantly reduced duration of cry: mean difference (in seconds) -13.47 (95% CI -16.80 to -10.51, $p < 0.00001$). There was considerable heterogeneity between studies and the review authors stated that they were unable to explain it. Duration of cry was the only outcome for which meta-analysis could be done, due to differences in study design, but most of the individual studies that assessed pain in other ways found that sucrose significantly reduced pain compared to controls. One study compared sucrose with Lidocaine-prilocaine cream and found no significant difference for the outcomes cry duration and pain. The review authors stated that, due to differences between the studies they could not determine the optimal concentration, volume or method of administration of sweet tasting solutions in this age group and that additional large RCTs are needed. They concluded that there was insufficient evidence to allow confident judgment of the effectiveness of sweet-tasting solutions in reducing needle-related pain in infants aged one to 12 months but the treatment appeared promising and further RCTs were warranted to determine the optimal concentration, volume and method of administration and to assess possible adverse effects.

Harrison D, Yamada J, Adams-Webber T, et al. 2011. **Sweet tasting solutions for reduction of needle-related procedural pain in children aged one to 16 years.** Cochrane Database of Systematic Reviews (10).
<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD008408.pub2/abstract>

This review included four RCTs with 330 participants in total. Two studies involved toddlers and pre-schoolers receiving either sucrose or water/no treatment for immunisation pain and two studies involved school-aged children who received either sweetened or unsweetened chewing gum before, or before and during, immunisation and blood collection. The results for the pre-schooler studies were conflicting. In one study the sucrose group had significantly lower cry duration and behavioural pain scores and in the other there was no difference in cry duration. In the school-age children sweetened chewing gum did not significantly reduce pain scores. The review authors concluded that: "Based on these four studies, two of which were subgroups of small numbers of eligible toddlers from larger studies, there is insufficient evidence of the analgesic effects of sweet tasting solutions or substances during acute painful procedures in children over one year of age. Further well-conducted RCTs are warranted in this population".

Williams N, Woodward H, Majeed A, et al. 2011. **Primary care strategies to improve childhood immunisation uptake in developed countries: systematic review.** JRSM Short Rep, 2(10), 81.
<http://researchonline.lshtm.ac.uk/1126650/1/SHORTS-11-112.pdf>

This review included 46 studies assessing strategies to optimise immunisation uptake for preschool children in developed countries, published between 1980 and 2009. It included 26 RCTs, 11 before and after studies, and 9 controlled intervention trials. Twenty two papers reported on 41 interventions involving parental reminders and recalls (by various methods including postcards, letters and telephone calls, both personal and automated). Using Black's quality scoring framework the review authors determined that the average quality score for these studies was 24.8 (out of a possible 29.5). Fourteen out of the 41 intervention arms (39%) found a statistically significant increase in immunisation rates (median 11%, range -11% to +19%). No one type of reminder/recall appeared to be better than any other. Two papers reported on two intervention arms assessing the effect of simple parental education programmes on immunisation uptake. Neither of them found a significant effect on immunisation rates. Five studies reported on six intervention arms looking at provider recall/reminder strategies (such as automatic computer notifications or the person dealing with patient records manually searching patients' records and notifying practitioners that immunisations are due). These studies had an average quality score of 23.7 (out of a possible 31). The median change in immunisation rate was +7% (range -2% to +33%). Four studies reported on four intervention arms studying the effect of provider education on immunisation rates. These studies had an average quality score of 22.4 and found a median change in immunisation rates of +8% (range 1% to 25%). Four studies reported on six intervention arms involving provider feedback as part of strategies to improve immunisation rates. The average quality score for these papers was 24.1 and the overall median change in immunisation rates was 19% (range 12% to 19%). Eight studies reported on eight intervention arms which featured a combination of interventions. These had an average quality score of 20.5 (out of a possible 31) and an overall median change in immunisation rates of 15% (range -4% to 47%). Three of these intervention arms reported that the change in immunisation rates was statistically significant and four did not report the significance level for their results. The review authors concluded that reminding parents and providers of upcoming and overdue immunisations as well as educating and giving feedback to immunisation providers can help improve immunisation rates. They stated that further research is needed to determine the cost-effectiveness of these interventions and their impact in groups with poor immunisation rates and in those at high risk of complications from vaccine-preventable diseases.

In their commentary on this review the CRD stated: "Concerns about study quality, reporting of the review and the synthesis mean that the conclusions may not be sufficiently cautious and reliable". The CRD commentary can be found here: http://www.crd.york.ac.uk/NIHR_CRDWEB/ShowRecord.asp?LinkFrom=OAI&ID=12012051405#.U4aPzPmSx8E

Glenton C, et al. 2011. **Can lay health workers increase the uptake of childhood immunisation? Systematic review and typology.** Tropical Medicine & International Health, 16(9), 1044-53.
<http://onlinelibrary.wiley.com/doi/10.1111/j.1365-3156.2011.02813.x/pdf>

This review assessed the effects of lay health workers (LHWs) on childhood immunisation uptake. Twelve studies, (including 10 RCTs) were included in the review, mostly comparing LHWs with no intervention or standard care. Seven of the studies were conducted among economically disadvantaged populations in high-income countries (LHWs made home visits to parents to promote routine childhood immunisations and encourage clinic visits for vaccination), and the remaining five studies were conducted in low and middle income countries (in some of which LHWs gave vaccinations). Most of the studies showed that LHWs increased immunisation coverage. The diversity of settings meant the meta-analysis was possible for only four of the studies, all in high income settings (3568 participants). These LHW programmes were associated with a statistically significant increased the number of children whose immunisations were up to date (RR 1.19, 95% CI 1.09 to 1.30). The authors conclude that while LHWs show promise in improving vaccination coverage, further high quality studies are needed in low and middle income countries.

National Collaborating Centre for Women's and Children's Health. 2009. **Reducing differences in the uptake of immunisations (including targeted vaccines) in children and young people aged under 19 years: systematic review of effectiveness and cost effectiveness evidence.** London: National Collaborating Centre for Women's and Children's Health. <http://www.nice.org.uk/nicemedia/live/12247/45534/45534.pdf>

This review provides the evidence base for the NICE guidance on reducing differences in uptake of immunisations. (The guidance can be found here: <http://guidance.nice.org.uk/PH21/Guidance/pdf/English>). The review is focused on what interventions are effective and cost effective in reducing differences in immunisation uptake in children and young people aged less than 19 years. The effectiveness review included 142 studies and the cost-effectiveness review included 10 studies. Three key themes were identified: issues relevant to all childhood vaccines; issues relevant to MMR as an exemplar of a universal vaccine; issues relevant to neonatal Hep B as an exemplar of a targeted vaccine. Interventions assessed included: recipient reminder/recall systems; home visits; client or family incentives/disincentives; interventions in school or day care settings; provider based interventions (including education, reminders and incentives); national immunisation programmes; and multi-component interventions. A review of studies examining barriers to immunisation and the views and experiences of children, young people, parents/carers, and health professionals is included. Only one study included evaluated differential uptake of immunisations across population subgroups, although numerous studies assessed targeted interventions. The executive summary provides 66 effectiveness evidence statements and three cost-effectiveness evidence statements. The quality of included studies was variable and while there were some RCTs included, only 16 intervention studies had the highest quality rating. Evidence-based recommendations include:

- improve access to immunisation services, for example, by extending clinic times and making sure clinics are 'child-friendly'
- provide parents and young people with tailored information and support and an opportunity to discuss any concerns
- check children and young people's immunisation status during health appointments and when they join nurseries, playgroups, schools and further education colleges, and offer them vaccinations
- ensure babies born to hepatitis B-positive mothers are given all recommended doses of the vaccine on time, a blood test to check for infection and, where appropriate, hepatitis B immunoglobulin.

Other Relevant Publications

Litmus. 2013. **Audience Research: Delayers of Infant Immunisation.** Wellington: Ministry of Health. <http://www.health.govt.nz/publication/audience-research-delayers-infant-immunisation>

This is the report of qualitative research commissioned by the Ministry of Health to learn more about the parents who have delayed one or more of their baby's immunisations. Understanding the reasons why some parents delay their child's immunisation is an important step in achieving the immunisation target. The research involved focus groups and interviews with 68 parents of infants aged eight to 12 months for whom one or more immunisations had not been administered on time. It found that parents had a strong desire to protect their babies' health. They generally believed babies are protected at home but vulnerable to disease once they start socialising outside the family. Starting early childhood education was often the "tipping point" for catching up with delayed immunisations. Parents had little understanding of the importance of timely immunisation and were reluctant to immunise an infant who was unwell. Mothers found support from their partner or other family member very valuable when their baby was being immunised. Most parents feared the immunisation experience even though they had confidence in vaccine safety. Low income families could find it difficult to get their babies' immunisations on time due to environmental factors such as not having transport. While most parents were comfortable having their child immunised in a clinical setting they did not like having to comfort a distressed infant in a public waiting room.

Litmus. 2012. **HPV Immunisation Programme Implementation Evaluation Volume 1: Final Report.** Wellington: Litmus. <http://www.health.govt.nz/publication/hpv-immunisation-programme-implementation-evaluation>

Litmus was commissioned by the Ministry of Health to evaluate the implementation of the HPV Immunisation Programme and assess whether the programme was equitable for Māori and Pacific girls (as the Ministry has a long term goal of reducing inequalities in cervical cancer). The evaluation focused on Māori, Pacific and Other (non-Māori, non-Pacific) young women in two groups: those born between 1990 and 1991 who could access the free vaccine up till 31 December 2011, and those born in 1997. The evaluation found that in the 1997 cohort, vaccine uptake targets for dose 1 were achieved for Māori and Pacific girls, but not for Other girls. Some Pākehā parents were not opposed to the vaccine but wished to delay it until their daughters were more mature while others perceived that it was only necessary for Māori and Pacific girls (an unintended consequence of targeting these groups). In the 1990–91 cohort, equity of uptake was achieved for Pacific young women, who achieved the target for doses 1 and 2 but not 3, but not for Māori who were around 10% under the target for doses 1, 2 and 3. Other young women were close to achieving the target for all three doses. Twice as many Māori and Pacific young women (as compared to Other young women) failed to access dose 3 after having received dose 1. Vaccine uptake appeared to be greater where there was integration and information sharing between the various components involved in programme implementation: DHB Planning and Funding; the HPV Team/Coordinator; school-based delivery; primary care delivery; and whānau engagement. Key ways to improve HPV vaccine coverage were stated to be: development of evidence-based strategies to counter misinformation about the HPV vaccine; increased integration of school-based and primary care delivery; and identifying possible health equity mechanisms that could be used in primary care delivery, including the role of and levers available to primary health organisations.

Health Committee. 2011. **Inquiry into how to improve completion rates of childhood immunisation, and Briefings from the Chief Coroner on the coronial process, from Dr Michael Tatley on the adverse reaction process, and from Professor Sir Peter Gluckman on how to improve completion rates of childhood immunisation.** 49th Parliament: March. http://www.parliament.nz/en-NZ/PB/SC/Documents/Reports/8/c/a/49DBSCH_SCR5060_1-Inquiry-into-how-to-improve-completion-rates-of.htm

This Parliamentary Health Committee inquiry into improving rates of childhood immunisation examined: statistics on timeliness and completion of vaccination in New Zealand, and international comparisons; the National Immunisation Register; relevant literature on optimising timeliness and completion rates; information on community concerns, informed consent and conscientious objection; and an assessment of the benefits of immunisation. A large number of recommendations are made regarding what methods could be applied at minimal cost to improve immunisation coverage in New Zealand. Recommendations include an expansion of targets to older age groups, improvements in the National Immunisation Register, exploration of provider and parent incentives, and improved information resources targeted at parents. Dr Nikki Turner's "six star" plan to improve rates of childhood immunisation, covering enhanced business as usual, contractual/legislative aspects, responsibilities and support for primary care and parents, communication and safety surveillance, is included in the appendices.

On 22 June 2011, the Government, led by the Ministry of Health, issued its response to the Health Select Committee's Report, noting that the Ministry had met, or that work was underway to meet, the majority (24) of the Report's 30 recommendations (http://www.parliament.nz/en-NZ/PB/Presented/Papers/6/d/4/49DBHOH_PAP21651_1-Government-Response-to-Report-of-the-Health-Committee.htm). A briefing paper, released by the Ministry of Health in August 2012 outlines the Ministry's progress on implementation of the six remaining recommendations, including ongoing exploration of incentives for parents and providers and improved immunisation information for pregnant women (<http://www.health.govt.nz/our-work/preventative-health-wellness/immunisation/immunisation-programme-decisions/progress-report-inquiry-how-improve-completion-rates-childhood-immunisation>).

Websites

Ministry of Health. 2014. **New Zealand Immunisation Schedule.** <http://www.health.govt.nz/our-work/preventative-health-wellness/immunisation/new-zealand-immunisation-schedule> accessed May 2014.

This web page contains the current immunisation schedule and links to other pages relevant to immunisation.

Ministry of Health. 2014. **2014 Immunisation Schedule Change.** <http://www.health.govt.nz/our-work/preventative-health-wellness/immunisation/new-zealand-immunisation-schedule/2014-immunisation-schedule-change> accessed June 2014.

This web page contains information on the changes to the immunisation schedule, and the following links to relevant publications:

- [Schedule from 1 July 2014 \(pdf, 139 KB\)](#)
- [Rotavirus and the RotaTeq vaccine: Factsheet for vaccinators and health professionals \(pdf, 162 KB\)](#)
- [Rotavirus and the RotaTeq vaccine: Factsheet for vaccinators and health professionals \(docx, 293 KB\)](#)
- [Additional Funded vaccines for special groups \(pdf, 110 KB\)](#)

Note: The publications listed were identified using the search methodology outlined in **Appendix 1**

PLUNKET CHILDREN RECEIVING CORE WELL CHILD CONTACTS

Introduction

Plunket is one of the Well Child/Tamariki Ora (WCTO) providers contracted by the Ministry of Health to provide Well Child services to newborn babies, and preschool children.

A number of contractual changes have occurred in Plunket's provision of WCTO services over the years. Between 2002 and 2012, Plunket was contracted to deliver a minimum of seven core contacts at specified age bands (Table 32) along with additional services such as contact via telephone. In 2007, the 8th core contact was excluded from the Plunket contract and became the B4School Check subsequent to a review of the WCTO Framework. In October 2012, flexibility increased with respect to the age at which core contacts could occur. For example, the first three contacts could occur between the ages of 2 weeks–15 weeks 6 days and up to 5% of the Core 4–7 contacts could occur in the next age band (**Table 32**). In 2013, Plunket was contracted to deliver an average of six core contacts and an equivalent number of additional contacts. These additions can include joint face-to-face visits and joint care planning.

In addition to the WCTO visits, Plunket provides support to families through PlunketLine and Facebook Chats, as well as services such as parenting education, support groups, car seat schemes and safety schemes. Plunket also has a number of contracts with some of the DHB's to provide services to clients.

Table 32. The age bands used by Plunket for the core Well Child/Tamariki Ora visits

Contact	Well Child/Tamariki Ora age	Plunket age band (pre 2012)	Plunket age band (post 2012)
Core 1	4–6 weeks	2 weeks–5 weeks 6 days	3 contacts between ages: 2 weeks–15 weeks 6 days
Core 2	8–10 weeks	6 weeks–9 weeks 6 days	
Core 3	3–4 months	10 weeks–15 weeks 6 days	
Core 4	5–7 months	16 weeks–7 months 4 weeks	16 weeks–7 months 4 weeks
Core 5	9–12 months	7 months 4 weeks 1 day– 13 months 4 weeks	7 months 4 weeks 1 day– 13 months 4 weeks
Core 6	15–18 months	13 months 4 weeks 1 day– 20 months 4 weeks	13 months 4 weeks 1 day– 20 months 4 weeks
Core 7	2–3 years	20 months 4 weeks 1 day– 47 months 4 weeks	20 months 4 weeks 1 day– 47 months 4 weeks
Core 8	B4School check	36 months–60 months	

The following section uses the Plunket data to assess the number of contacts Plunket has provided to children enrolled with Plunket before one year of age during July 2005–June 2013.

Data Sources and Methods

Indicator: Proportion of Plunket clients who received Well Child/Tamariki Ora contacts

Source: Plunket Database

Numerator: Number of Well Child contacts received by type of contact

Denominator: Number of new baby cases enrolled with Plunket at less than one year of age

Notes on Interpretation

Note 1: This data is based on new baby case information as extracted from the Plunket Database on 18 June 2014. Any new baby cases enrolled after one year of age is not included in these figures.

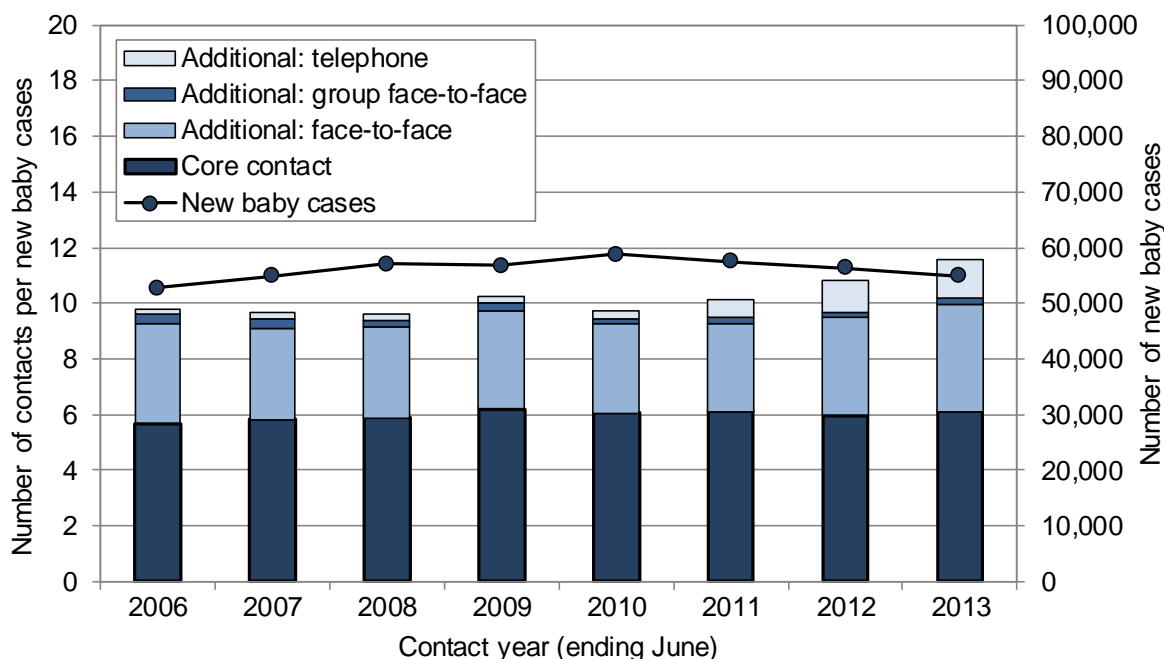
Note 2: Additional contacts are provided based on a needs assessment undertaken by the Plunket Nurse. The assessment determines the type of additional contact required, and who may undertake the contact, e.g. a health worker or another nurse.

New Zealand Distribution and Trends

In New Zealand during the period 1 July 2005–30 June 2013, around 56,000 new babies were enrolled with Plunket each year. The number of core contacts received by the new Plunket babies increased from 5.7 core contacts for the year ending June 2006 to 6.1 core contacts for the year ending June 2013. The number of additional contacts also increased. These were predominantly face-to-face contacts (**Figure 103**).

In the year ending June 2013 year, 54,958 new babies were enrolled with Plunket. They received 6.1 core contacts and 5.4 additional contacts (3.8 face-to-face, 0.2 group face-to-face, and 1.4 telephone).

Figure 103. Number of Plunket contacts for new babies enrolled, by contact type, New Zealand year ending June 2006–2013



Source: Plunket

Proportion Receiving Contacts by Ethnicity, and NZDep Index Decile

The number of core contacts and additional contacts for new babies enrolled with Plunket increased for all ethnic groups between the years ending June 2006 and 2013. Although Māori and Pacific babies had lower numbers of core contacts provided by Plunket compared with babies of other ethnicities, they received higher numbers of additional contacts (**Figure 104**).

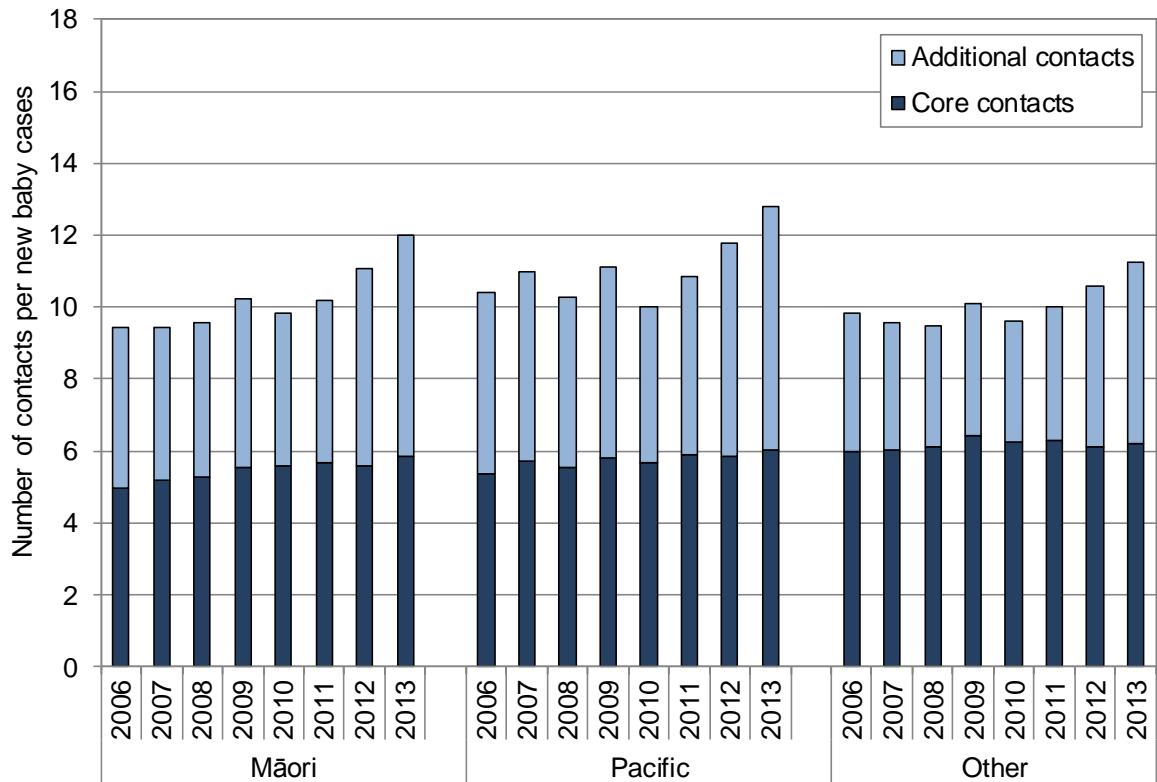
In the year ending June 2013, Māori babies received 12.0 contacts provided by Plunket (5.8 core contacts and 6.2 additional contacts), while Pacific babies received 12.8 contacts, of which 6.0 were core contacts and 6.8 were additional contacts.

During 2006 to 2013 (years ending 30 June), new babies enrolled with Plunket who resided in the least deprived areas (NZDep deciles 1–2) received higher numbers of core contacts compared with babies residing in the most deprived areas (NZDep deciles 9–10), however, the babies residing in the most deprived areas received higher numbers of additional contacts (**Figure 105**).

In the year ending June 2013, the number of contacts for new babies who resided in the least deprived areas was 10.8 contacts (6.4 core contacts and 4.4 additional contacts) compared with those residing in the most deprived areas who had 13.1 contacts (5.9 core contacts and 7.2 additional contacts).

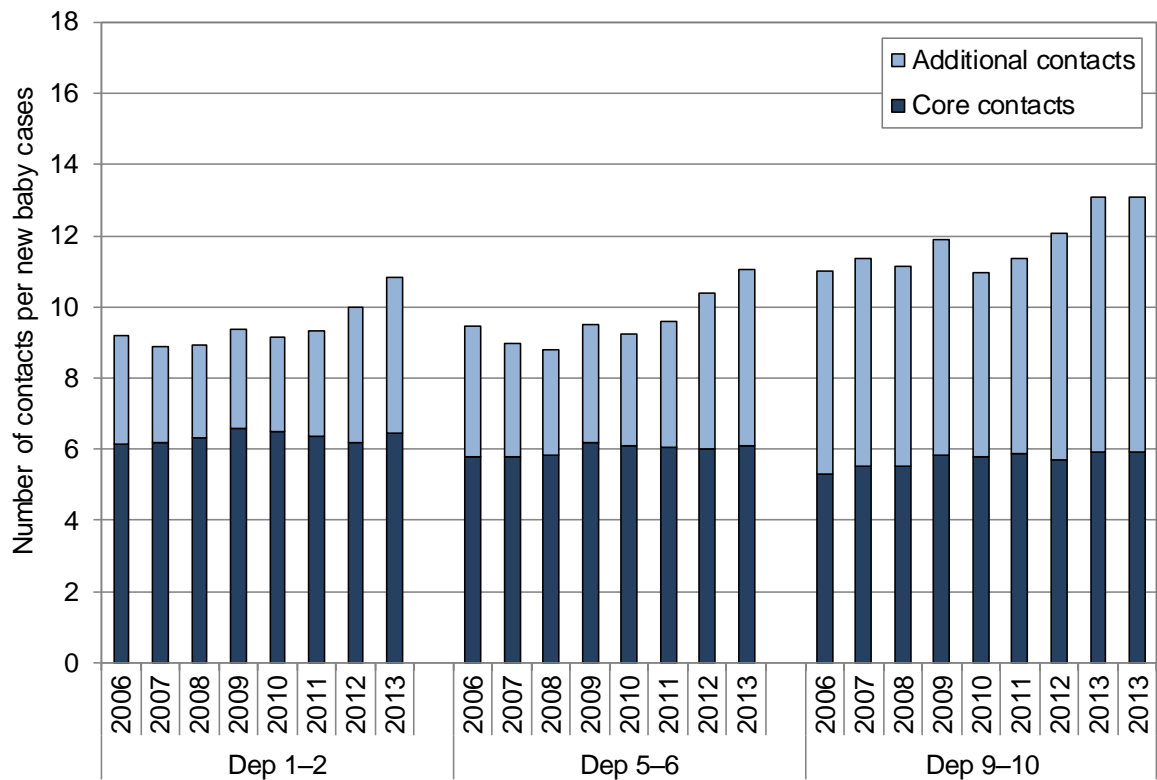


Figure 104. Number of Plunket contacts for new babies enrolled, by contact type and ethnicity, New Zealand years ending June 2006–2013



Source: Plunket

Figure 105. Number of Plunket contacts for new babies enrolled, by contact type and selected NZ Deprivation Index deciles, New Zealand years ending June 2006–2013



Source: Plunket



Northern DHBs Distribution and Trends

Northern DHB Trends

In the Northern DHBs during 2006–2013 (years ending 30 June), the number of core contacts received by new babies enrolled with Plunket remained relatively static. However the number of additional contacts (which were predominantly face-to-face contacts) was higher in 2013 than in 2006 in all four DHBs (**Figure 106**).

Distribution by Ethnicity

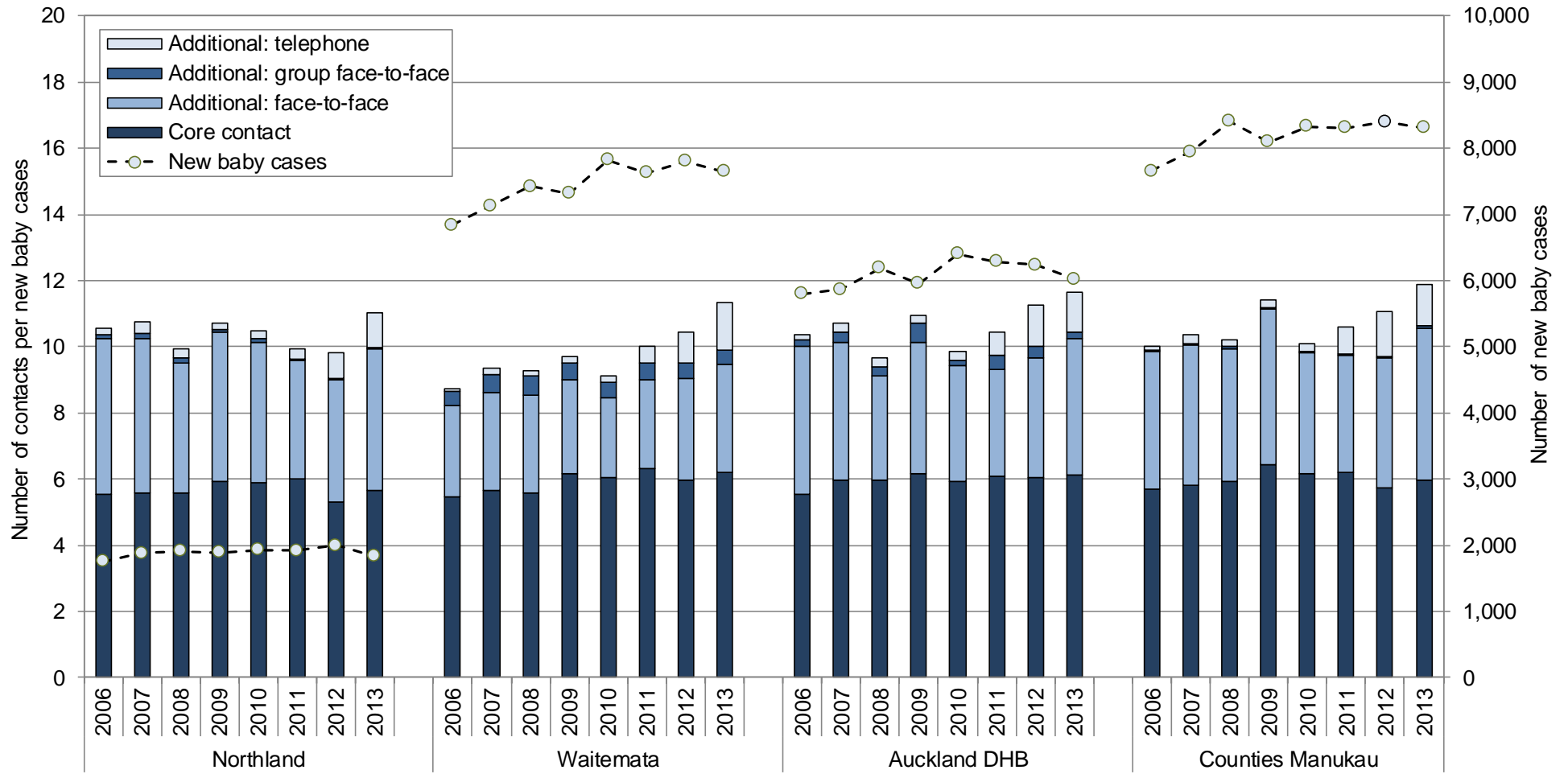
In the Northern DHBs in the year ending June 2013, there were no marked ethnic differences in the number of core contacts received by new babies enrolled with Plunket. However, Māori and Pacific babies received a higher number of additional contacts than babies from Other ethnic groups in all four DHBs (although differences between Māori and Other babies in Waitemata were small) (**Figure 107**).

Distribution by NZDep Index Decile

In the Northern DHBs in the year ending June 2013, there were no marked socioeconomic differences (as measured by NZDep Index decile) in the number of core contacts received by new babies enrolled with Plunket. However, babies from the most deprived areas (NZDep deciles 9–10) received a higher number of additional contacts than babies from the least deprived areas (NZDep deciles 1–2) in all four DHBs (**Figure 108**).

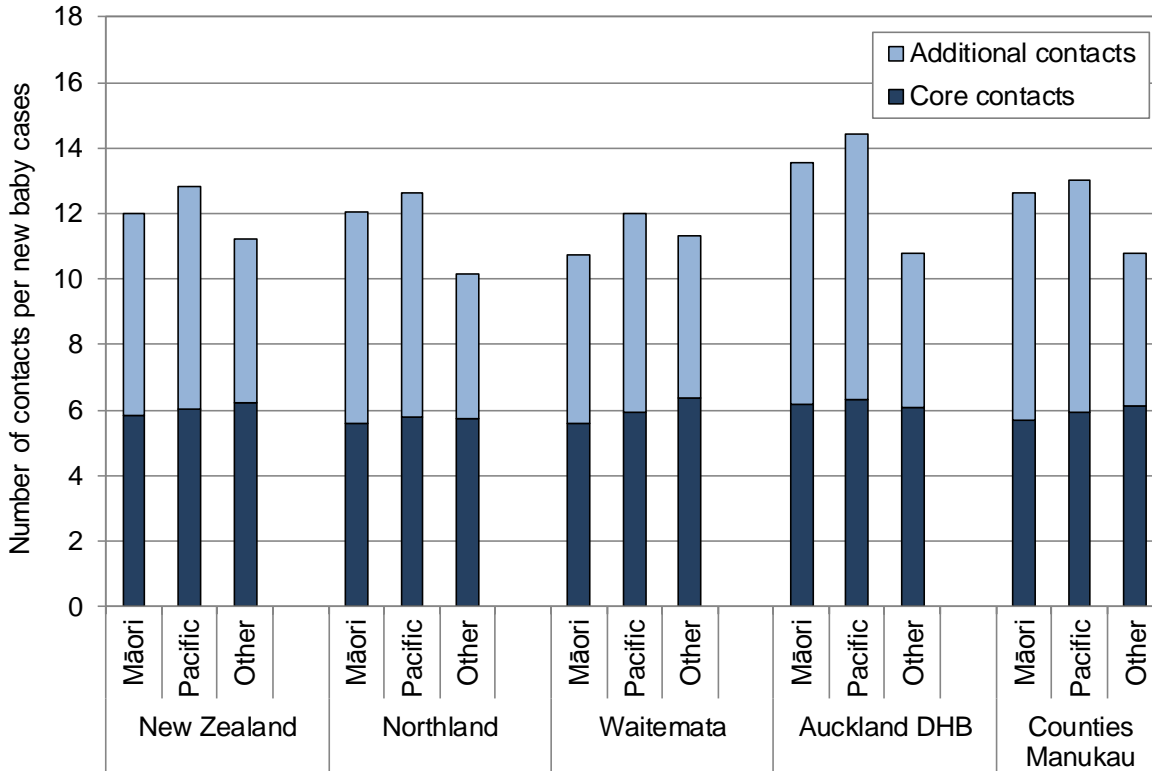


Figure 106. Number of Plunket contacts for new babies enrolled by contact type, Northern DHBs years ending June 2006–2013



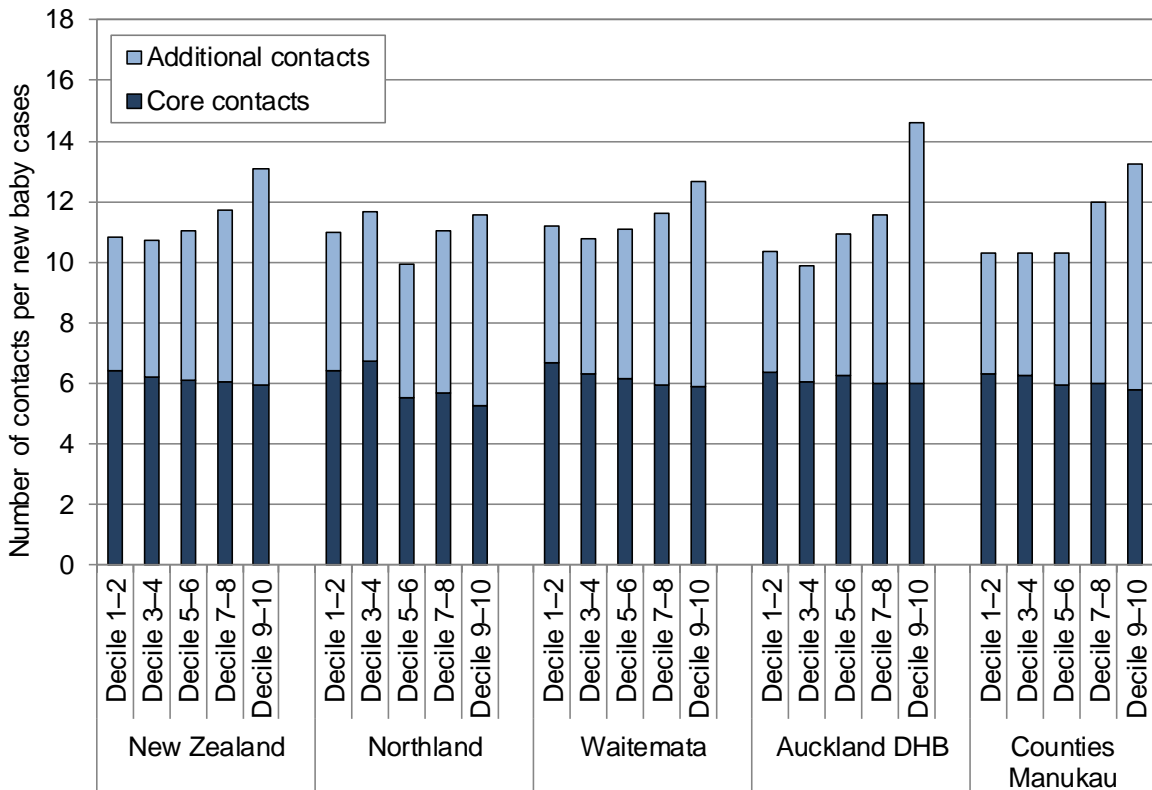
Source: Plunket

Figure 107. Number of Plunket contacts for new babies enrolled, by contact type and ethnicity, Northern DHBs vs. New Zealand year ending June 2013



Source: Plunket

Figure 108. Number of Plunket contacts for new babies enrolled, by contact type and NZ Deprivation Index decile, Northern DHBs vs. New Zealand year ending June 2013



Source: Plunket



THE B4 SCHOOL CHECK

Introduction

The B4 School Check (B4SC) aims to promote the health and wellbeing of preschool age children and to identify any behavioural, developmental or health concerns that might impact on their ability to learn in the school environment [231]. It is offered to the families of all four year old children, with its key elements comprising [255]:

- A Child Health Questionnaire
- Hearing & vision screening: sweep audiometry, tympanometry, distance visual acuity
- Measurement of height and weight
- Behavioural and developmental questions using the Strengths and Difficulties Questionnaire (SDQ) and Parental Evaluation of Developmental Status (PEDS) tools
- An oral health screen using *Lift the Lip* and a check for school dental clinic enrolment
- Health promotion and education (e.g. information resources, advice and support)
- Referrals to appropriate health, education and social services where the need for these services has been identified

The B4SC itself is carried out by registered nurses with experience in child health with the help of other providers such as Vision and Hearing Technicians. Parents are provided with a full explanation of what the B4SC involves and must sign a consent form before the check can commence. Checks may take place in a variety of settings including preschools, kohanga reo, doctors' clinics, churches and marae. While most children are assessed at age four, children missing out are offered a School New Entrant Check which includes at a minimum, hearing and vision screening [231].

The following section uses the B4 School Check Information System to review the proportion of children receiving a B4 School Check.

Data Sources and Methods

Indicators

1. *Proportion of eligible children who received a B4 School Check (coverage)*

Numerator: Number of children who have received and completed their B4 School Check between the ages of 4 years and 5 years 7 days

Denominator: Number of children eligible for a B4 School Check

2. *Proportion of eligible children whose caregivers declined a B4 School Check*

Numerator: Number of children whose caregiver did not consent to a B4 School Check

Denominator: Number of children eligible for a B4 School Check

3. *Proportion of children receiving a B4 School Check who commenced their check before 4.5 years*

Numerator: Number of children who commenced a B4 School Check prior to 4.5 years of age (i.e. prior to 4 years and 6 months)

Denominator: Number of children who commenced a B4 School Check

Data Source

Numerator: B4 School Check Information System

Denominator: PHO Enrolment Collection (indicators 1 and 2 only)

Notes on Interpretation⁷

Note 1: The data presented cover the years 2012 to 2014 with each year ending on the 7th July.

Note 2: The calculation of coverage rates (indicator 1) includes children whose caregivers formally declined the B4 School Check but who received some of its components (e.g. hearing and vision screening; as per the Ministry of Health's usual methodology).

Note 3: Indicator 3 excludes children whose caregivers did not consent to a B4 School Check from both the numerator and the denominator

Note 4: DHB is DHB of service rather than DHB of residence

Note 5: The term *high deprivation* refers to those residing in NZ Deprivation Index decile 9–10 areas. The Ministry of Health sets coverage targets for both the total population and for those from high deprivation areas.

Note 6: While information on a wide range of ethnic groups was available from the B4 School Check Information System, denominators from the PHO Enrolment Collection were restricted to three ethnic groups: Māori, Pacific, and European/Other. Thus this analysis is restricted to these three broad ethnic groups, with the European/Other category including European, Asian/Indian, MELAA, and Other children, as well as those whose ethnicity was not stated.

New Zealand Distribution and Trends

Coverage: New Zealand Trends

In New Zealand during 2012–2014 (years ending 7 July), the proportion of children receiving a B4 School Check increased from 77.8% (n=51,137) in 2012 to 91.2% (n=59,581) in 2014. Coverage rates were very similar when the analysis was restricted to those from the most deprived areas (NZDep deciles 9–10; **Figure 109**).

Coverage: Trends by Ethnicity

During 2012–2014 (years ending 7 July), a higher proportion of European/Other children than Māori or Pacific children received a B4 School Check. However, coverage increased for all ethnic groups during this period, with 96.1% of European, 82.7% of Māori, and 79.7% of Pacific children receiving a B4 School Check in the year ending 7th July 2014 (**Figure 110**).

Timeliness: New Zealand Trends

During 2012–2014 (years ending 7 July), the proportion of children receiving a B4 School Check who started this check prior to 4.5 years of age changed very little, being 80.6% in 2012 and 82.5% in 2014. The proportion starting their checks in a timely manner was very similar when the analysis was restricted to those from the most deprived areas (NZDep deciles 9–10) (**Figure 111**).

Timeliness: Trends by Ethnicity

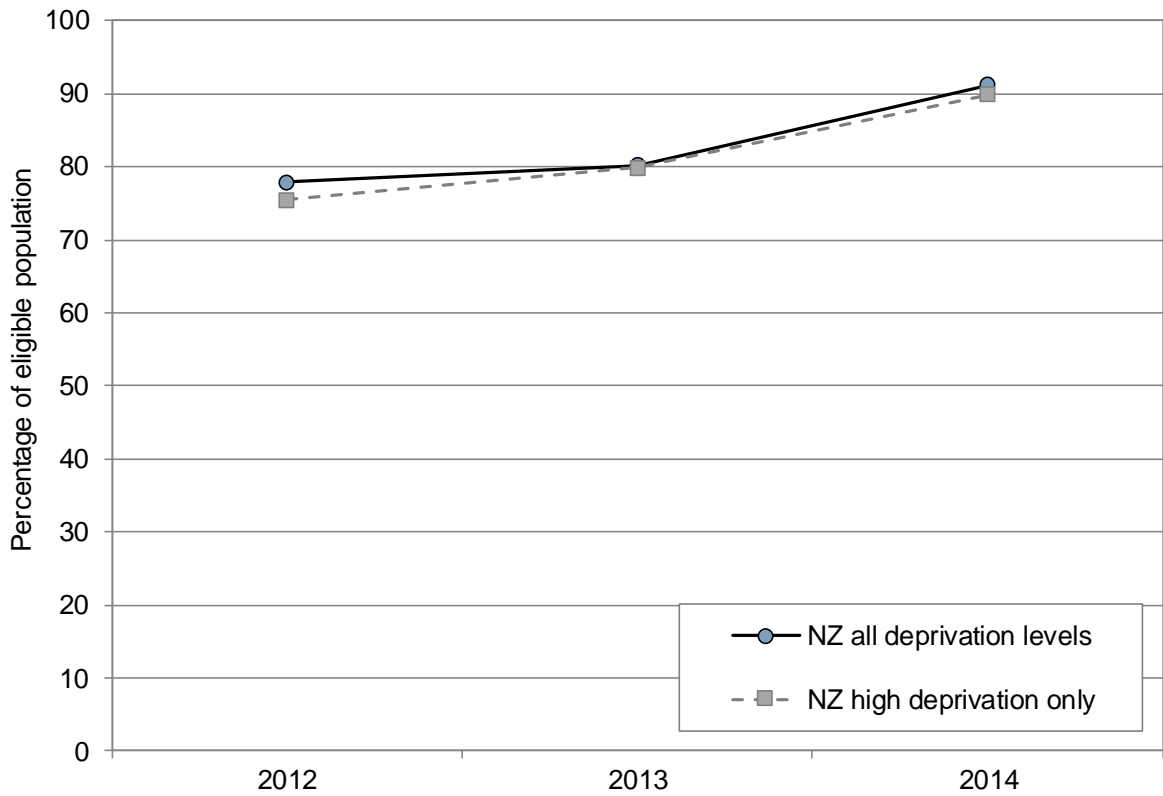
During 2012–2014 (years ending 7 July), a slightly higher proportion of European/Other and Pacific children started their B4 School Check prior to 4.5 years of age than did Māori children. In the year ending 7th July 2014, 84.1% of European/Other, 80.9% of Pacific, and 78.0% of Māori children who received a B4 School Check had started this check prior to 4.5 years of age (**Figure 112**).

Decline Rates

During 2012–2014 (years ending 7 July), a lower proportion of the caregivers of children from the most deprived areas (NZDep deciles 9–10) declined a B4 School Check, than did the caregivers of New Zealand children as a whole. In 2014 the decline rates were low for both groups, with 2.1% (n=336) for children from the most deprived areas and 2.9% (n=1,907) for New Zealand children as a whole (**Figure 113**).

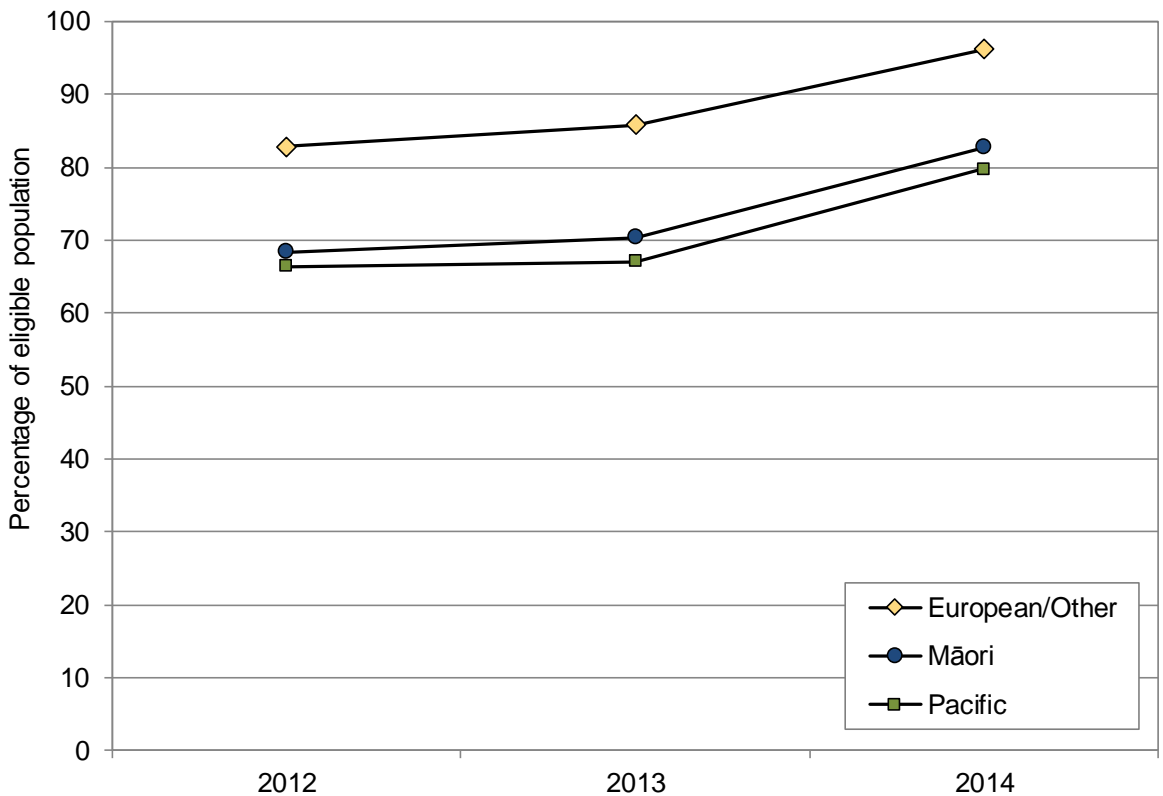


Figure 109. Percentage of children receiving their B4 School Check, New Zealand years ending 7 July 2012–2014



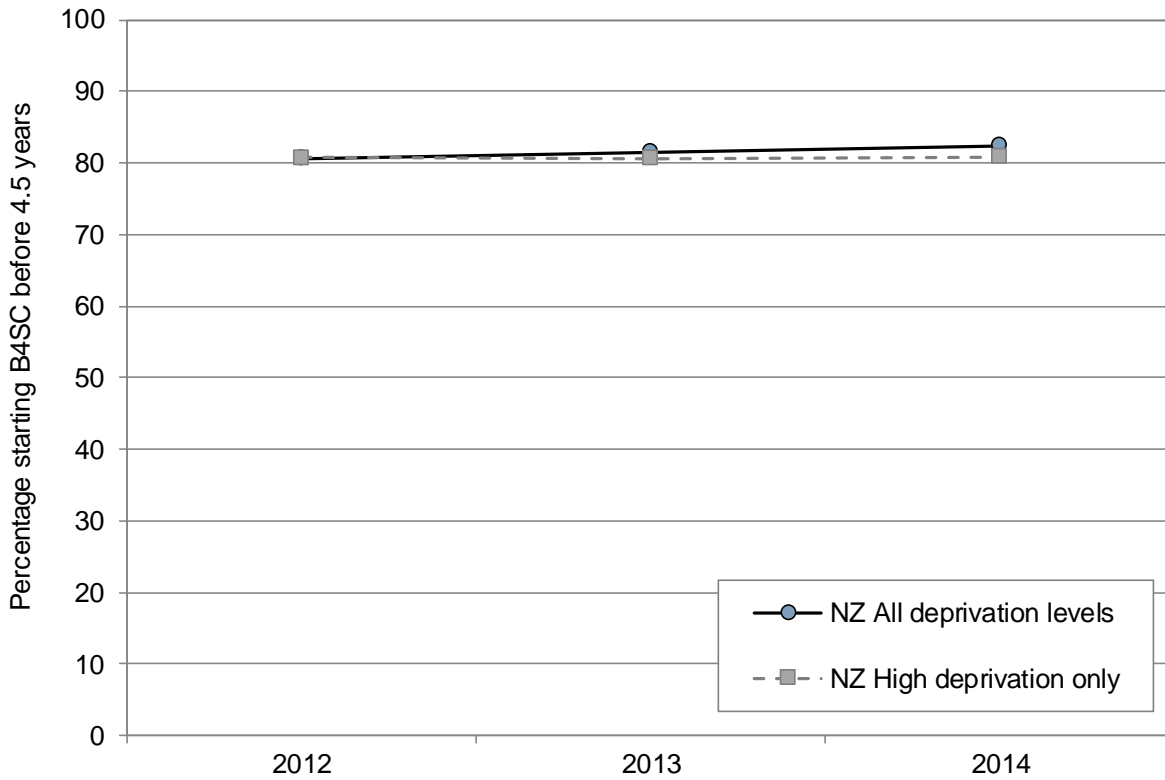
Source: Numerator: B4 School Check Information System; Denominator: PHO Enrolment Collection; Note: high deprivation refers to those residing in NZDep decile 9–10 areas

Figure 110. Percentage of children receiving their B4 School Check by ethnicity, New Zealand years ending 7 July 2012–2014



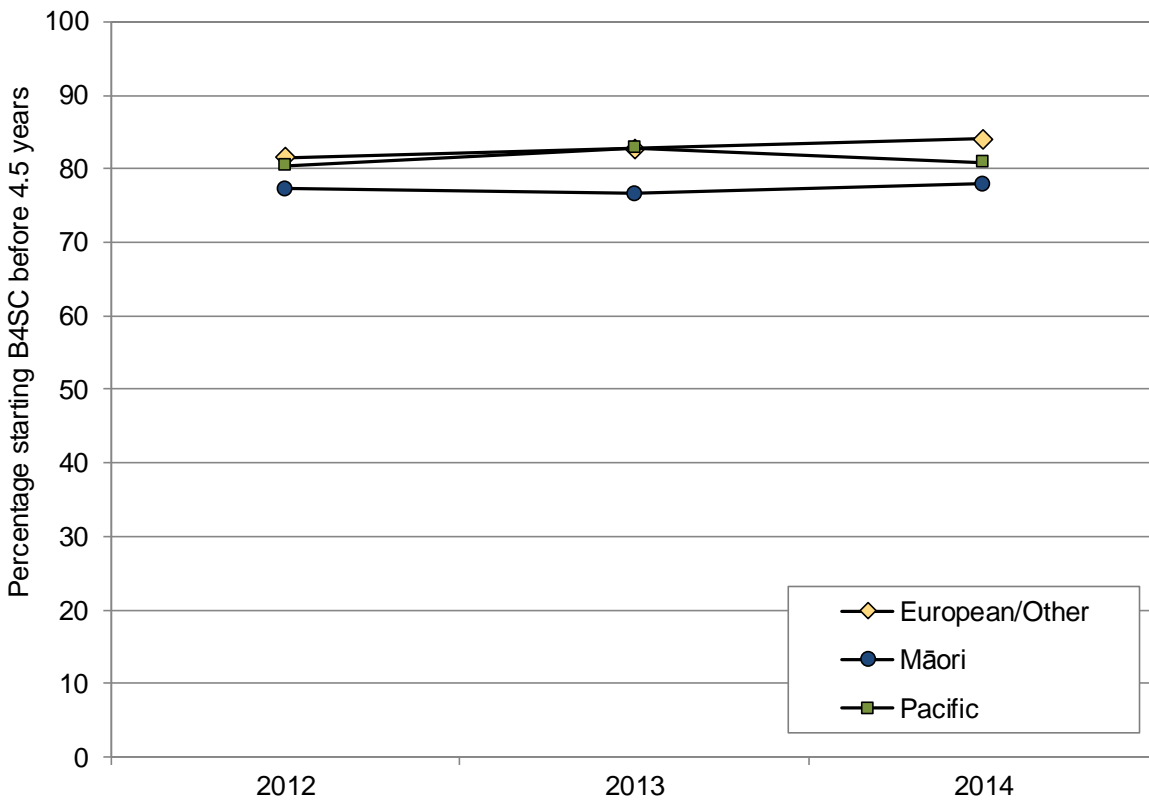
Source: Numerator: B4 School Check Information System; Denominator: PHO Enrolment Collection; Note: European/Other includes European, Asian/Indian, MELAA, Other, Not stated

Figure 111. Percentage of children starting their B4 School Check (B4SC) before 4.5 years of age, New Zealand years ending 7 July 2012–2014



Source: B4 School Check Information System; Note: high deprivation refers to those residing in NZDep decile 9–10 areas

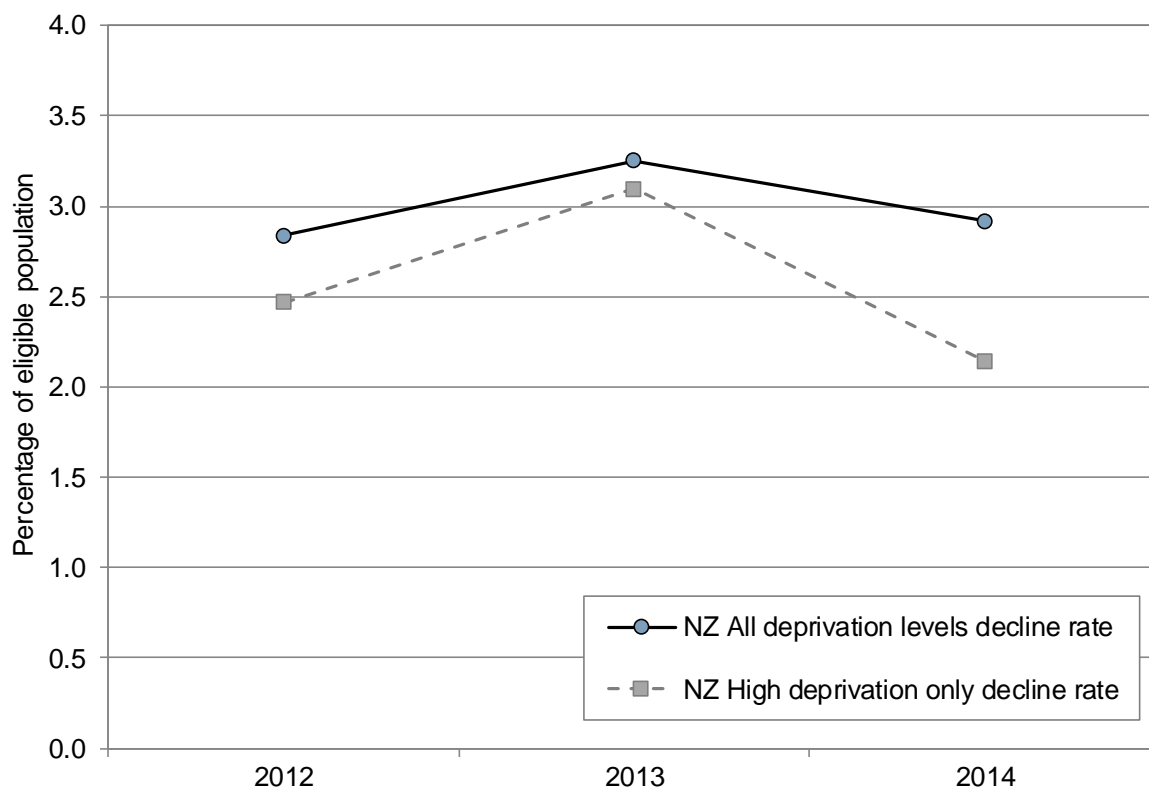
Figure 112. Percentage of children starting their B4 School Check (B4SC) before 4.5 years of age by ethnicity, New Zealand years ending 7 July 2012–2014



Source: B4 School Check Information System; Note: European/Other includes European, Asian/Indian, MELAA, Other, and Not stated



Figure 113. Percentage of children whose caregivers declined a B4 School Check, New Zealand years ending 7 July 2012–2014



Source: Numerator: B4 School Check Information System; Denominator: PHO Enrolment Collection; Note: high deprivation refers to those residing in NZDep decile 9–10 areas

Northern DHBs Distribution and Trends

Coverage: Northern DHB Trends

During 2012–2014 (years ending 7 July), the proportion of children receiving a B4 School Check increased in all four Northern DHBs, with coverage in Northland and Counties Manukau being very similar to the New Zealand rate. However, coverage in Auckland DHB was consistently lower than the New Zealand rate, while coverage in the Waitemata DHB was lower during 2012 and 2013. Similar patterns were seen when the focus was restricted to those from the most deprived areas (**Figure 114**).

Coverage: Trends by Ethnicity

In the Waitemata, Auckland and Counties Manukau DHBs during 2012–2014 (years ending 7 July), a higher proportion of European/Other than Māori or Pacific children received a B4 School Check, while in Northland coverage was higher for European than for Māori children (**Figure 115**).

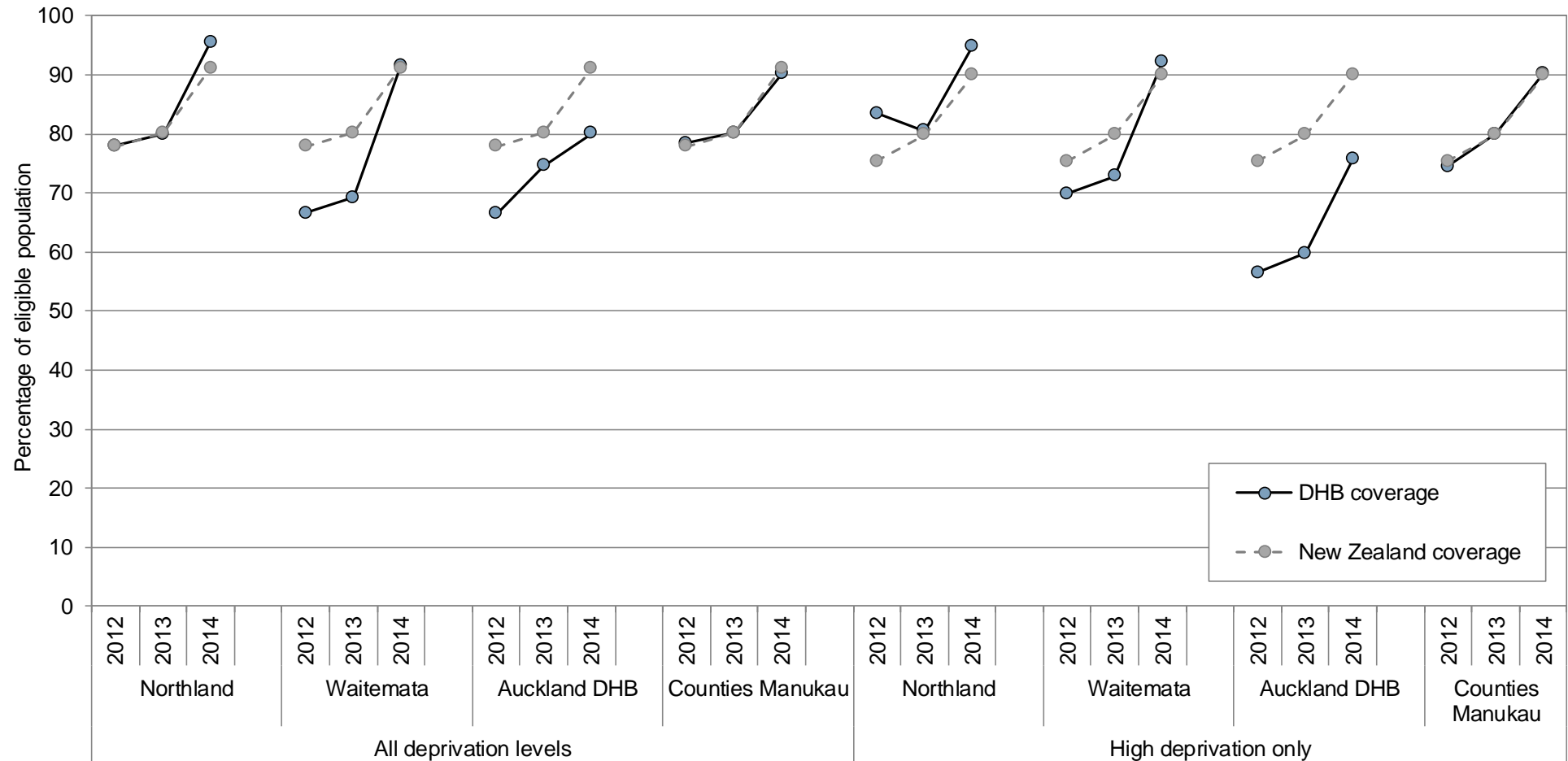
Timeliness: Northern DHB Trends

In the Northland and Auckland DHBs during 2012–2014 (years ending 7 July), the proportion of children receiving a B4 School Check who started their check prior to 4.5 years of age was consistently lower than the New Zealand rate. In Counties Manukau however, rates were higher than the New Zealand rate, while in the Waitemata DHB rates were similar to the New Zealand rate (**Figure 116**).

Decline Rates

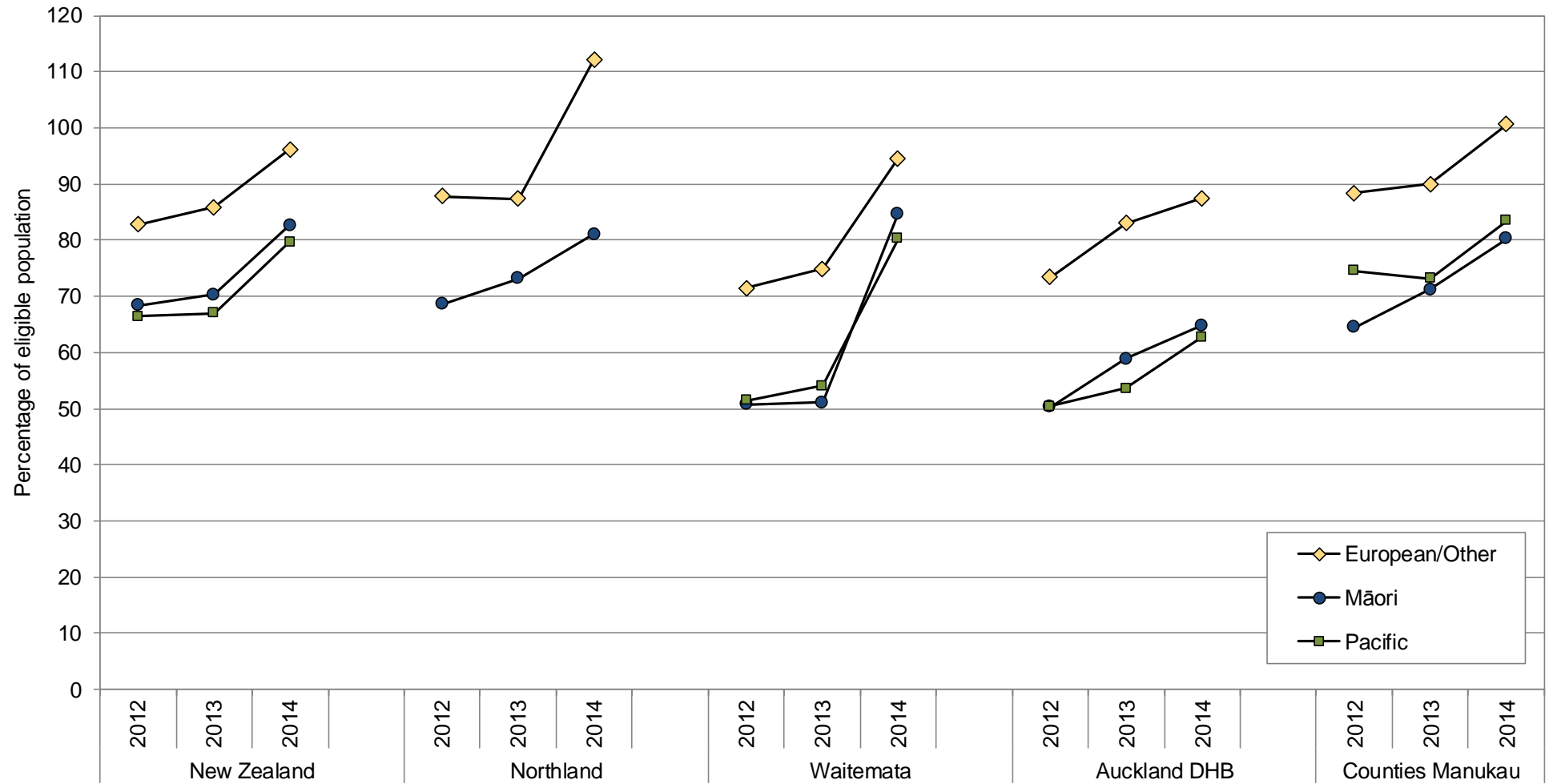
During the year ending 7 July 2014, 5.2% (n=131) of Northland, 4.0% (n=336) of Waitemata, 2.5% (n=158) of Auckland and 1.8% (n=164) of Counties Manukau caregivers of eligible children declined a B4 School Check.

Figure 114. Percentage of children receiving their B4 School Check, Northern DHBs vs. New Zealand years ending 7 July 2012–2014



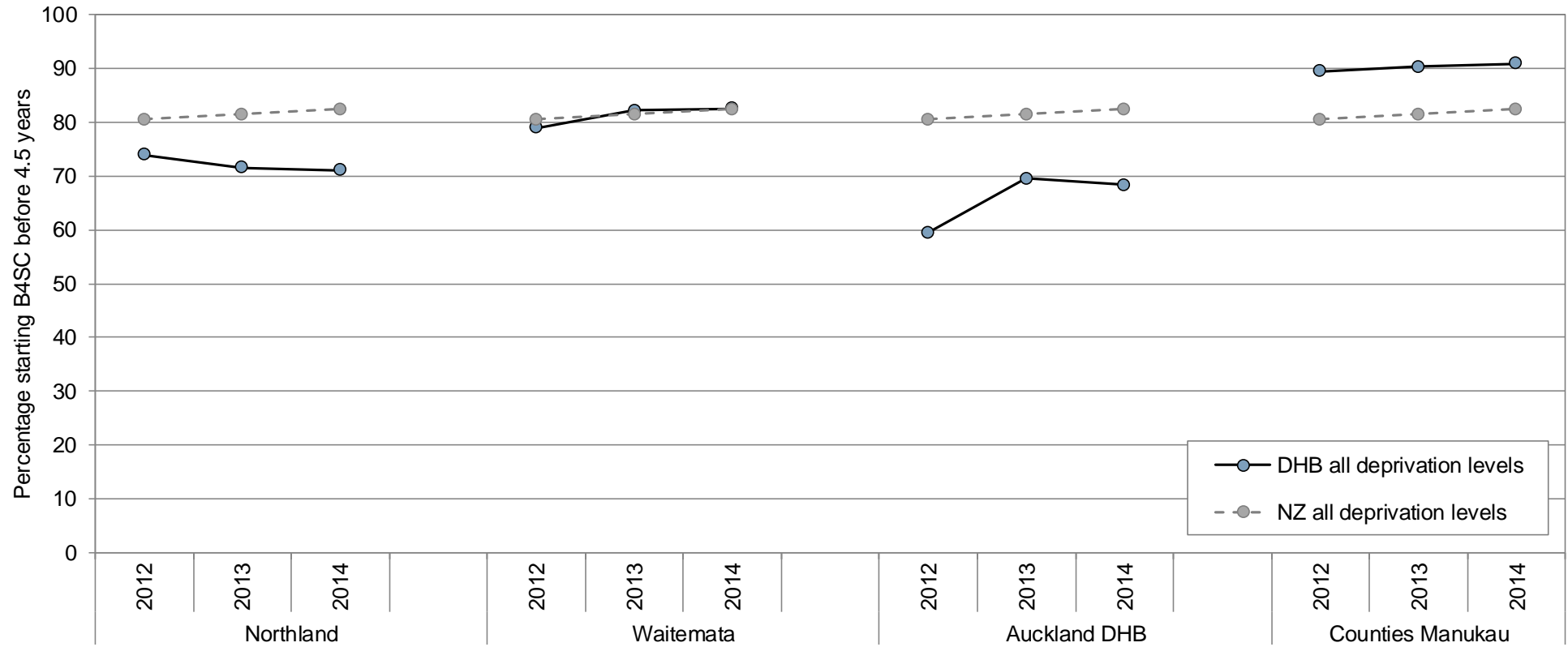
Source: Numerator: B4 School Check Information System; Denominator: PHO Enrolment Collection; Note: high deprivation refers to those residing in NZDep decile 9–10 areas

Figure 115. Percentage of children receiving their B4 School Check by ethnicity, Northern DHBs vs. New Zealand years ending 7 July 2012–2014



Source: Numerator: B4 School Check Information System; Denominator: PHO Enrolment Collection; Note: European/Other includes European, Asian/Indian, MELAA, Other, and Not stated

Figure 116. Percentage of children starting their B4 School Check (B4SC) before 4.5 years of age, Northern DHBs vs. New Zealand years ending 7 July 2012–2014



Source: B4 School Check Information System

B4 SCHOOL CHECK: HEARING AND VISION SCREENING

Hearing Screening

Hearing screening and surveillance are key parts of the Well Child Tamariki Ora programme, with screening beginning shortly after birth as part of the Universal Newborn Hearing Screening and Early Intervention Programme. Hearing surveillance then continues at each core Well Child Check, until four years of age, when the next formal hearing screen occurs as part of the B4 School Check [231].

The B4 School Check occurs as soon as possible after the child turns four. The aims of its hearing screening component are to [231]:

1. Identify hearing loss that is likely to interfere with normal speech, language development and learning;
2. Find children with persistent middle-ear disease that is likely to lead to significant hearing loss;
3. Identify and refer children with hearing-related developmental or learning difficulties, so that appropriate intervention can be initiated prior to the child starting primary school.

Children missing this component of the B4 School Check are checked at school entry [231].

Hearing screening involves screening audiometry (also known as the sweep test), with tympanometry only being used to further assess children with an abnormal screening result (although some DHBs use targeted tympanometry screening for groups at high risk from otitis media with effusion) [231]. Following screening, one of four possible outcomes is recorded [231]:

1. **Not tested** because the child was unable or unwilling to participate. These children are booked for rescreening in three months' time
2. A **Pass** is recorded if the child hears audiometry screening levels of 20 dB at 1000, 2000 and 4000 Hz and 30 dB at 500 Hz bilaterally
3. A **Rescreen** is scheduled if the child hears 40 dB bilaterally at 1000 Hz, but does not respond to the next or any other tone
4. A child is **Referred** for further assessment if they do not respond to 40 dB in either the right or the left ear at 1000 Hz.

Referral pathways vary by region, but, in general, referrals for suspected sensorineural hearing loss are made to audiology, while referrals for suspected conductive hearing loss (e.g. due to otitis media with effusion) are made to general practitioners or ear nurses. However, as a sensorineural hearing loss may be masked by a conductive hearing loss, any identified middle ear disease must be treated and the child retested once this has resolved [231].

The following section uses the B4 School Check Information System to review hearing screening outcomes for children undergoing a B4 School Check, while a later section reviews the outcome of vision screening.



Data Sources and Methods

Indicators

1. *Proportion of children who required hearing rescreening*

Numerator: Number of children recorded as requiring hearing rescreening in the B4SC-IS

Denominator: Number of children who had a hearing screening outcome recorded in the B4SC-IS

2. *Proportion of children who failed audiometry and required hearing rescreening*

Numerator: Number of children who failed audiometry in one or both ears and who were recorded as requiring hearing rescreening in the B4SC-IS

Denominator: Number of children who had a hearing screening outcome recorded in the B4SC-IS

3. *Proportion of children who failed audiometry and required referral*

Numerator: Number of children who failed audiometry in one or both ears and who were recorded as requiring a referral in the B4SC-IS

Denominator: Number of children who had a hearing screening outcome recorded in the B4SC-IS

Data Source

B4 School Check Information System (B4SC-IS)

Notes on Interpretation

Note 1: Indicator 1 includes those children who underwent audiometry and were recorded as requiring rescreening, as well as those who did not undergo audiometry (e.g. as a result of developmental or behavioural issues, or for other reasons) but were recorded as requiring rescreening.

Note 2: Children whose caregivers declined the B4 School Check or its hearing screening component were excluded from all analyses, as were those who were already under care for hearing problems.

Note 3: DHB is DHB of service rather than DHB of residence

Note 4: The term *High deprivation* refers to those residing in NZ Deprivation Index decile 9–10 areas, while the term *Low-Average deprivation* refers to those residing in decile 1–8 areas.

Note 5: While information on a wide range of ethnic groups was available in the B4SC-IS, this analysis has been restricted to three broad ethnic groups: Māori, Pacific, and European/Other, in order to ensure comparability with the previous section on the B4 School Check (which explored coverage and timeliness).

Note 6: Care should be taken when interpreting DHB vs. New Zealand differences or trends over time, as it is likely that many of these differences arise from local variations in service delivery, or the way DHBs record information in the B4 School Check Information System, rather than from real differences in the prevalence of hearing problems or middle ear disease in the community.

Note 7: Because of the live nature of the B4SC-IS, the number of children requiring rescreening and referral may vary over time, as in some DHBs, staff update the B4SC-IS (to either pass or refer) once the outcome of the rescreen is known. In other DHBs however, the field is left unchanged (as rescreen). While the B4SC-IS generally becomes more stable with time (as the results of children's rescreens are entered) differences in the way DHBs update the B4SC-IS following rescreening may be responsible for some of the differences seen.

New Zealand Distribution and Trends

New Zealand Trends

In New Zealand during 2012–2014 (years ending 7 July), the proportion of children requiring rescreening because of failed audiometry was lower than the total rescreen rate, presumably as many children were unable to complete their initial audiometry (e.g. as a result of developmental, behavioural or other issues). While total and failed audiometry rescreen rates both declined during this period, the proportion of children requiring referral following failed audiometry was more static (5.5% in 2012 and 5.8% in 2014) (**Figure 117**).

Trends by Ethnicity

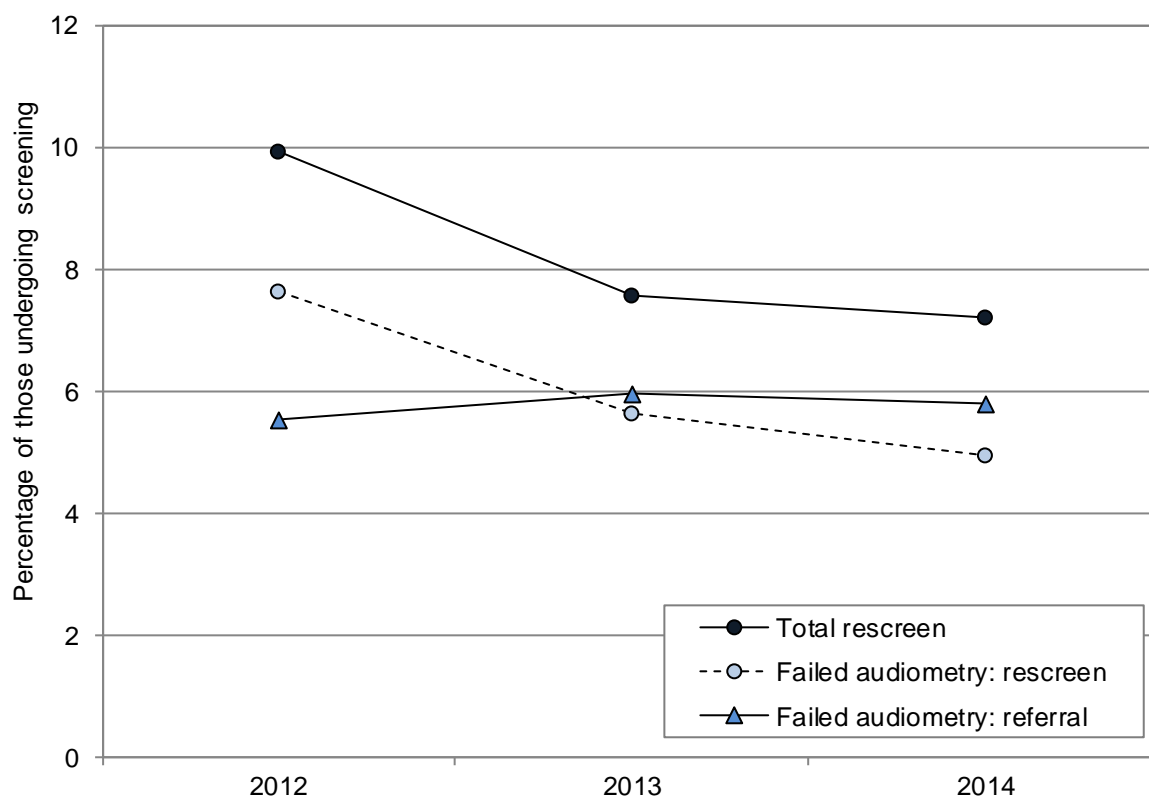
During 2012–2014 (years ending 7 July), a *significantly higher* proportion of Pacific, than Māori, than European/Other children required rescreening or referral following failed audiometry (**Table 33**). Rescreening rates declined for all ethnic groups during this period, while referral rates for Pacific and European/Other children were more static (**Figure 118**).

Trends by NZ Deprivation Index Decile

During 2012–2014 (years ending 7 July), a *significantly higher* proportion of children from the most deprived areas (NZDep deciles 9–10 vs. deciles 1–8) required rescreening or referral following failed audiometry (**Table 33**). Rescreening rates declined for both socioeconomic groups during this period, while referral rates were more variable (**Figure 119**).



Figure 117. Percentage of children who failed hearing screening and who required rescreening or referral, New Zealand B4 School Check years ending 7 July 2012–2014



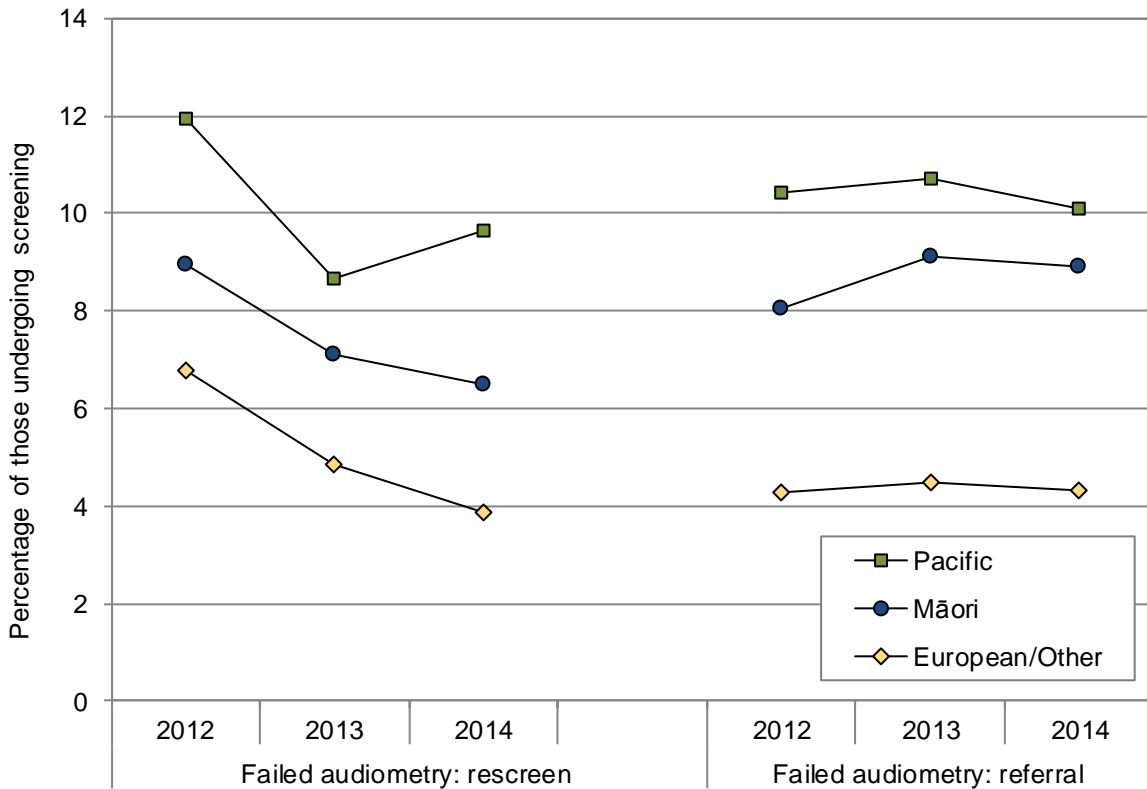
Source: B4 School Check Information System; Note: Excludes children already under care for hearing problems

Table 33. Children who failed audiometry and who required rescreening or referral, by ethnicity and NZ Deprivation Index Decile, New Zealand B4 School Check years ending 7 July 2012–2014

Variable	Number: total 2012–2014	Number: annual average	%	Rate ratio	95% CI
Failed audiometry: rescreen					
NZ Deprivation Index decile					
Deciles 1–8 (low-average deprivation)	6,374	2,125	5.48	1.00	
Deciles 9–10 (high deprivation)	2,722	907	7.79	1.42	1.36–1.49
Ethnicity					
Māori	2,203	734	7.43	1.46	1.39–1.53
Pacific	1,412	471	10.03	1.97	1.86–2.08
European/Other	5,481	1,827	5.09	1.00	
Failed audiometry: referral					
NZ Deprivation Index decile					
Deciles 1–8 (low-average deprivation)	5,739	1,913	4.93	1.00	
Deciles 9–10 (high deprivation)	3,001	1,000	8.59	1.74	1.67–1.82
Ethnicity					
Māori	2,584	861	8.71	2.00	1.91–2.09
Pacific	1,464	488	10.40	2.38	2.25–2.52
European/Other	4,692	1,564	4.36	1.00	

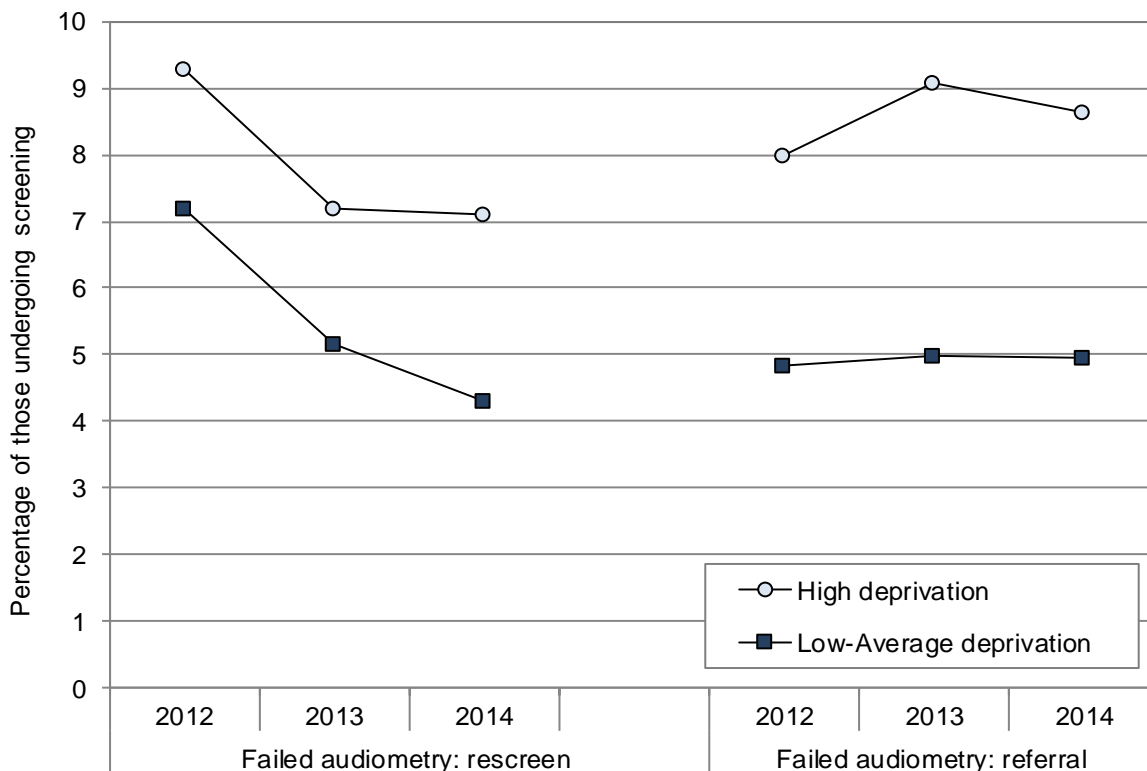
Source: B4 School Check Information System; Note: Excludes children already under care for hearing problems; European/Other includes European, Asian/Indian, MELAA, Other, and Not stated

Figure 118. Children who failed audiometry and who required rescreening or referral, by ethnicity, New Zealand B4 School Check years ending 7 July 2012–2014



Source: B4 School Check Information System; Note: Excludes children already under care for hearing problems; European/Other includes European, Asian/Indian, MELAA, Other, and Not stated

Figure 119. Percentage of children who failed audiometry and who required rescreening or referral, by NZ Deprivation Index Decile, New Zealand B4 School Check years ending 7 July 2012–2014



Source: B4 School Check Information System; Excludes children already under care for hearing problems; High deprivation is NZDep deciles 9–10, Low-Average deprivation is NZDep deciles 1–8



Northern DHBs Distribution and Trends

Northern DHB Trends

In the Northland and Waitemata DHBs during 2012–2014 (years ending 7 July), the proportion of children requiring rescreening or referral following failed audiometry was consistently lower than the New Zealand rate, while in the Auckland DHB rates were not consistently different from the New Zealand rate. In Counties Manukau the proportion requiring rescreening following failed audiometry was similar to the New Zealand rate, while the proportion requiring referral was consistently higher (**Figure 120**).

Note: Care should be taken when interpreting DHB vs. New Zealand differences or trends over time, as it is likely that many of these differences arise from local variations in service delivery, or the way DHBs record information in the B4 School Check Information System, rather than from real differences in the prevalence of hearing problems or middle ear disease in the community.

Distribution by Ethnicity

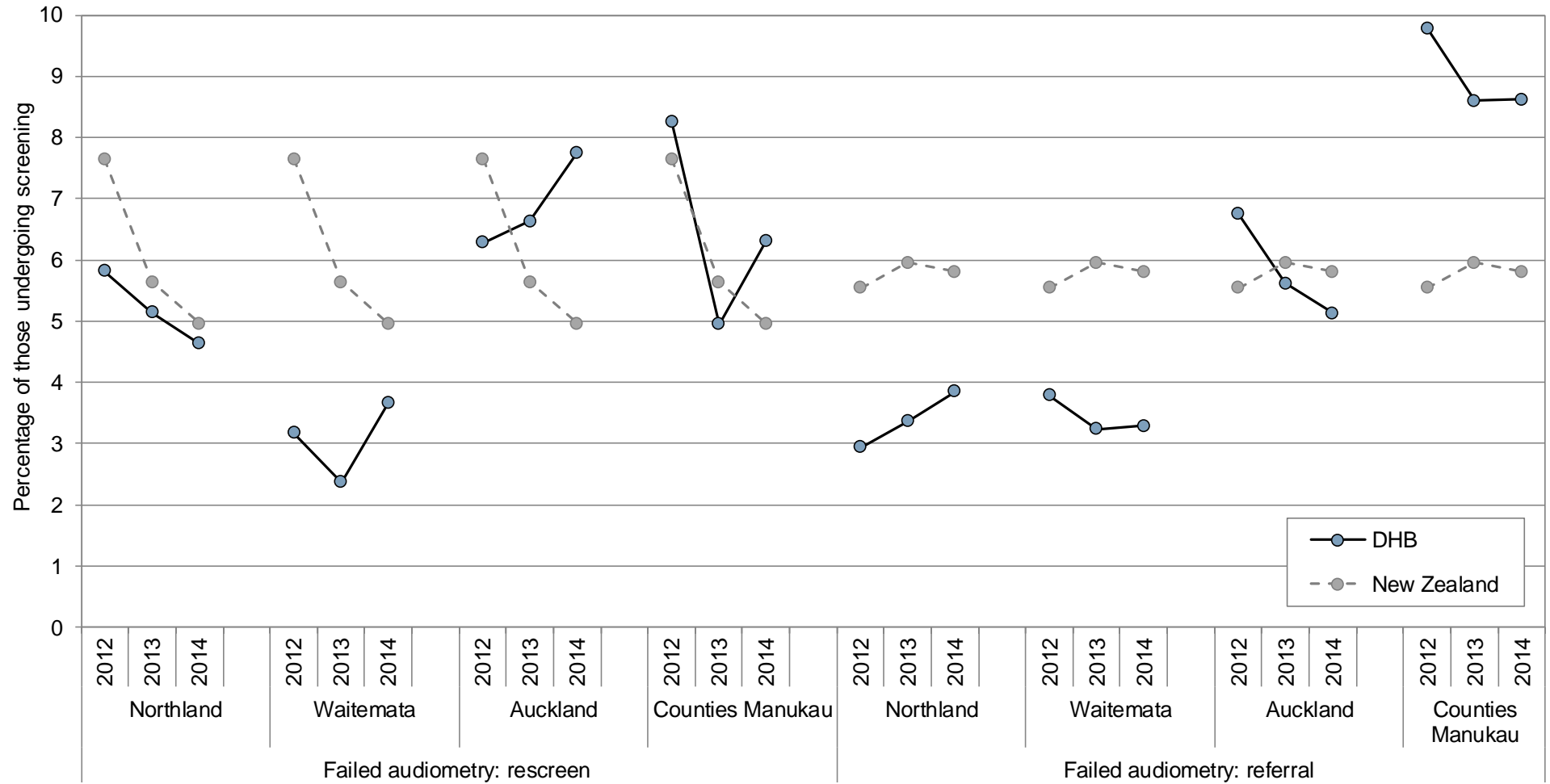
In the Waitemata, Auckland and Counties Manukau DHBs during 2012–2014 (years ending 7 July), a higher proportion of Pacific and Māori children than European/Other children required referral following failed audiometry, while in Northland a higher proportion of Māori than European/Other children required referral (**Figure 121**).

Distribution by NZ Deprivation Index Decile

In all four Northern DHBs during 2012–2014 (years ending 7 July), a higher proportion of children from the most deprived areas (NZDep decile 9–10 vs. decile 1–8) required referral following failed audiometry (**Figure 122**).

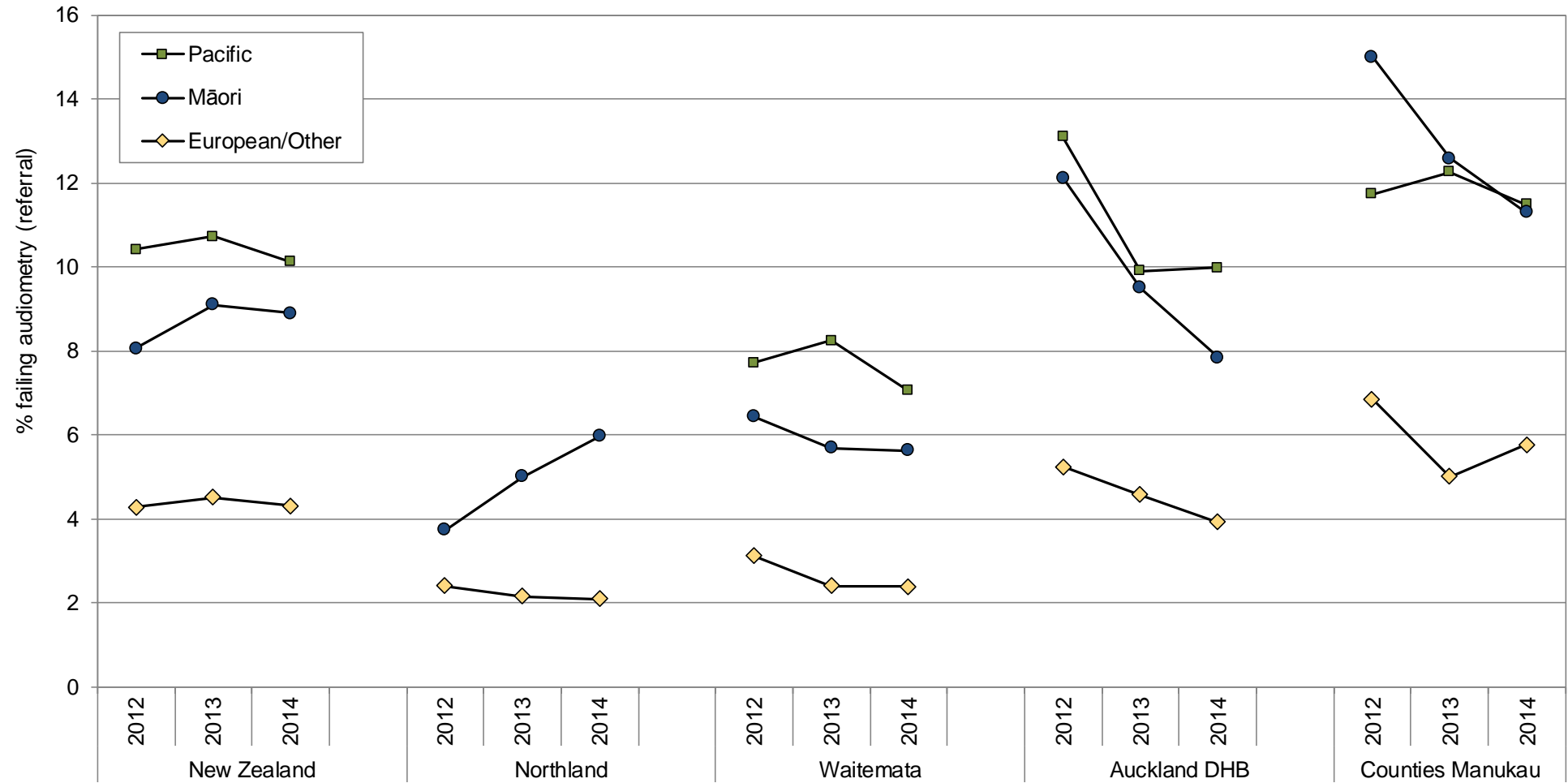


Figure 120. Percentage of children who failed audiometry and who required rescreening or referral, Northern DHBs vs. New Zealand B4 School Check years ending 7 July 2012–2014



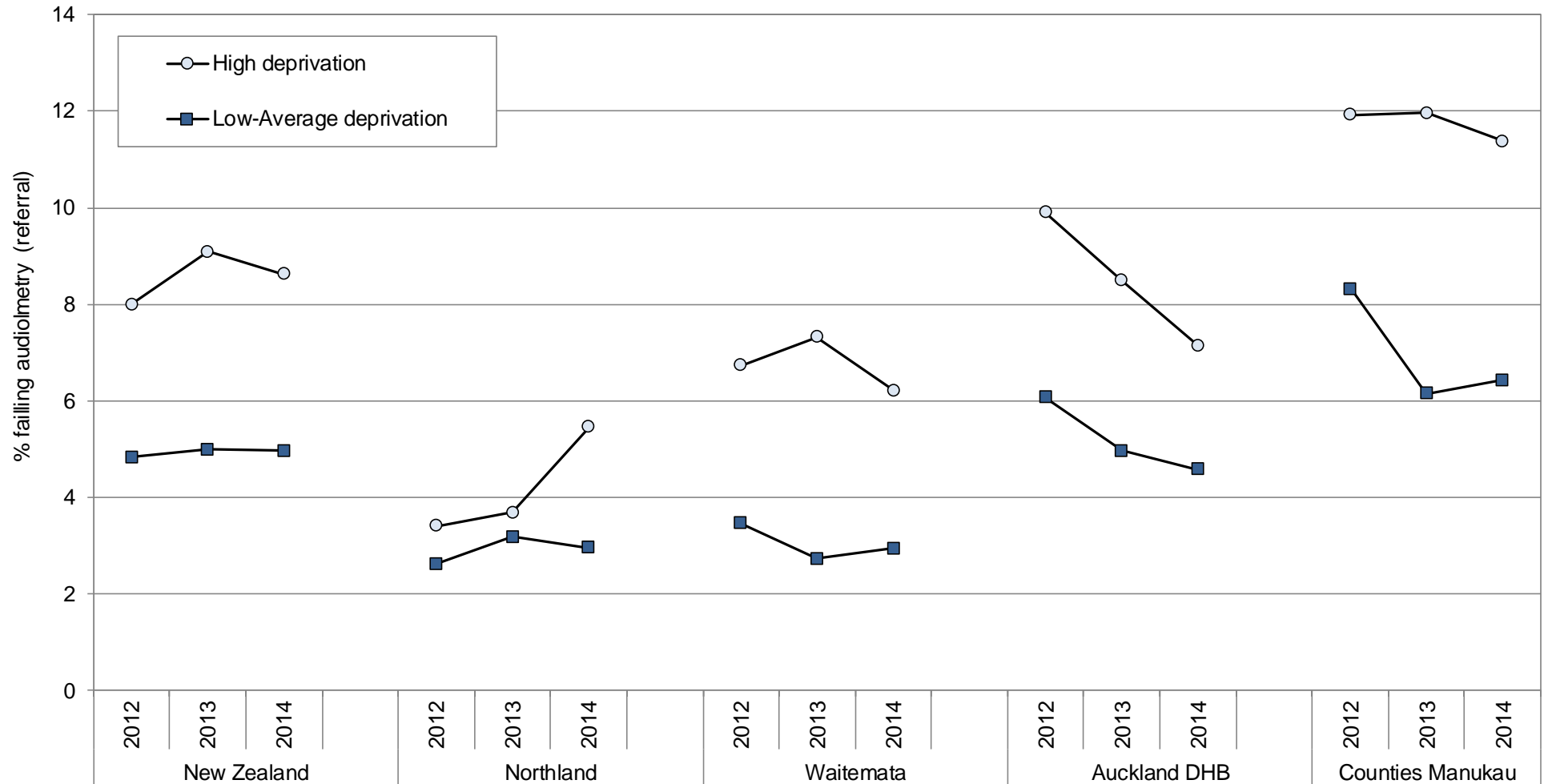
Source: B4 School Check Information System; Note: Excludes children already under care for hearing problems

Figure 121. Percentage of children who failed audiometry and who required referral, by ethnicity, Northern DHBs vs. New Zealand B4 School Check years ending 7 July 2012–2014



Source: B4 School Check Information System; Note: Excludes children already under care for hearing problems; European/Other includes European, Asian/Indian, MELAA, Other, and Not stated

Figure 122. Percentage of children who failed audiometry and who required referral, by NZ Deprivation Index decile, Northern DHBs vs. New Zealand B4 School Check years ending 7 July 2012–2014



Source: B4 School Check Information System; Note: Excludes children already under care for hearing problems; High deprivation is NZDep deciles 9–10, Low-Average deprivation is NZDep deciles 1–8

Vision Screening

Approximately 10–15% of preschool children are estimated to have visual deficits, with around 1–3% having amblyopia (lazy eye) which can lead to permanent vision loss in one eye if it is not treated early. Distance visual acuity is measured as part of the B4 School Check at four years of age with a view to [231]:

1. Identifying children who may have amblyopia at an age when it may still be treatable
2. Referring children who are unable to complete the screen for further assessment

Children missing this component of the B4 School Check are checked at school entry. However, if the child is under the care of an ophthalmic/optometric practitioner, screening is unnecessary, whether the child wears glasses or not [231].

In the B4 School Check, distance visual acuity is measured using either Parr letter-matching vision charts or Sheridan Gardner charts. Screening has three possible outcomes [231]:

1. A **Pass** is recorded if the child's vision is 6/9 or better in both eyes
2. A **Rescreen** within three to six months is recorded if the child's vision is 6/9 in one eye and 6/6 in the other (as one eye may be improving or one eye getting worse and a rescreen will distinguish between the two)
3. A **Refer** is recorded if the child's vision is 6/12 or worse in one or both eyes. Referrals are made either to an ophthalmologist or an optometrist, depending on practitioner availability and parental preference.

The following section uses the B4 School Check Information System to review vision screening outcomes in this age group.

Data Sources and Methods

Indicator

1. *Proportion of children not already under care for vision problems who were recorded as having a visual acuity of 6/12 or worse in one or both eyes*

Numerator: Number of children with a visual acuity of 6/12 or worse in one or both eyes recorded in the B4SC-IS, who were not already under care for a vision problem

Denominator: Number of children who had a vision screening outcome recorded in the B4SC-IS and who were not already under care for a vision problem

Data Source

B4 School Check Information System (B4SC-IS)

Notes on Interpretation

Note 1: Children whose caregivers declined the B4 School Check or its vision screening component were excluded from all analyses, as were those who were already under care for a vision problem.

Note 2: DHB is DHB of service rather than DHB of residence

Note 3: The term *High Deprivation* refers to those residing in NZ Deprivation Index decile 9–10 areas, while the term *Low-Average Deprivation* refers to those residing in decile 1–8 areas.

Note 4: While information on a wide range of ethnic groups was available in the B4SC-IS, this analysis has been restricted to three broad ethnic groups: Māori, Pacific and European/Other, in order to ensure comparability with the previous section on the B4 School Check (which explored coverage and timeliness).

Note 5: Care should be taken when interpreting ethnic and socioeconomic differences as it is unclear whether they reflect real differences in the underlying prevalence of vision problems, or differences in early identification and access to care (as children already under care for a vision problem have been excluded from the analysis).

Note 6: Care should be taken when interpreting DHB vs. New Zealand differences or trends over time, as it is likely that many of these differences arise from local variations in service delivery, or the way DHB staff record information in the B4 School Check Information System, rather than from real differences in the prevalence of vision problems in the community.



New Zealand Distribution and Trends

New Zealand Trends

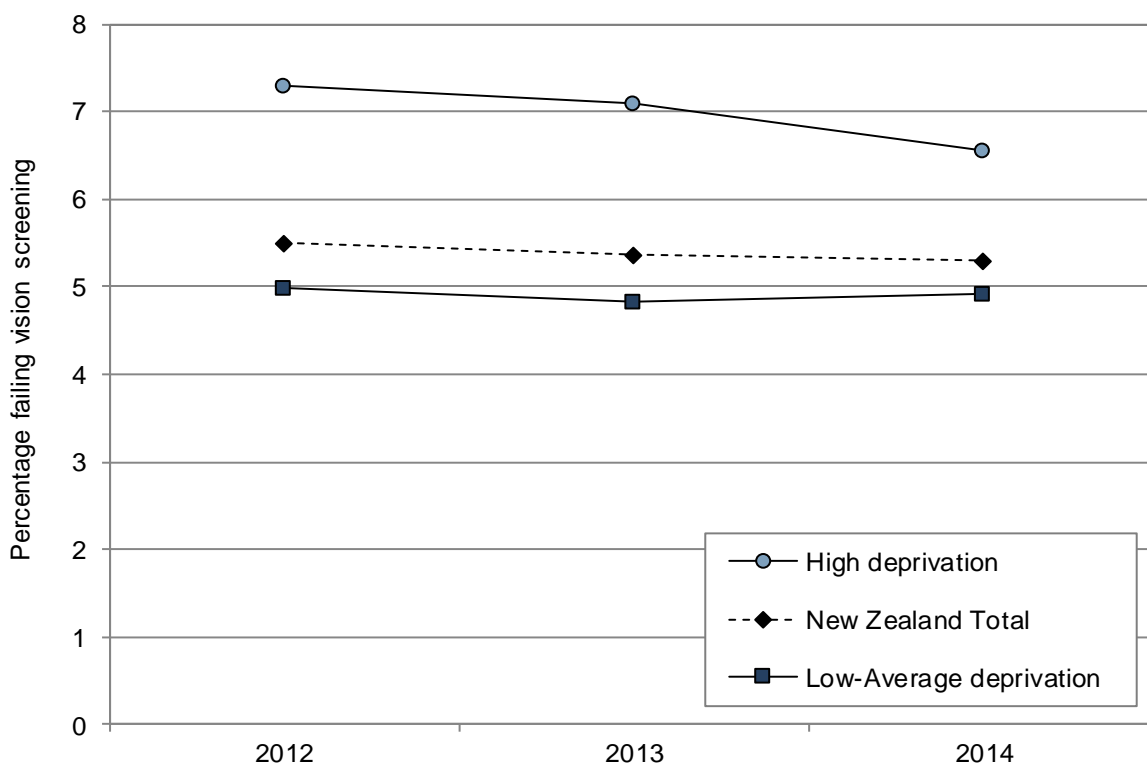
In New Zealand during 2012–2014 (years ending 7 July), the proportion of children not already under care with a visual acuity of 6/12 or worse in one or both eyes changed very little, being 5.5% in 2012 and 5.3% in 2014 (**Figure 123**).

Trends by NZ Deprivation Index Decile

In New Zealand during 2012–2014 (years ending 7 July), a *significantly higher* proportion of children from the most deprived areas (NZDep deciles 9–10 vs. deciles 1–8) had an untreated visual acuity of 6/12 or worse in one or both eyes (**Table 34**). However rates for children from the most deprived areas declined during this period, while rates for children from less deprived areas were more static (**Figure 123**).

Note: Care should be taken when interpreting these differences as it is unclear whether they reflect real differences in the underlying prevalence of vision problems, or differences in early identification and access to care (as children already under care for a vision problem have been excluded from the analysis).

Figure 123. Percentage of children not already under care who had a visual acuity of 6/12 or worse in one or both eyes by NZ Deprivation Index decile, New Zealand B4 School Check years ending 7 July 2012–2014



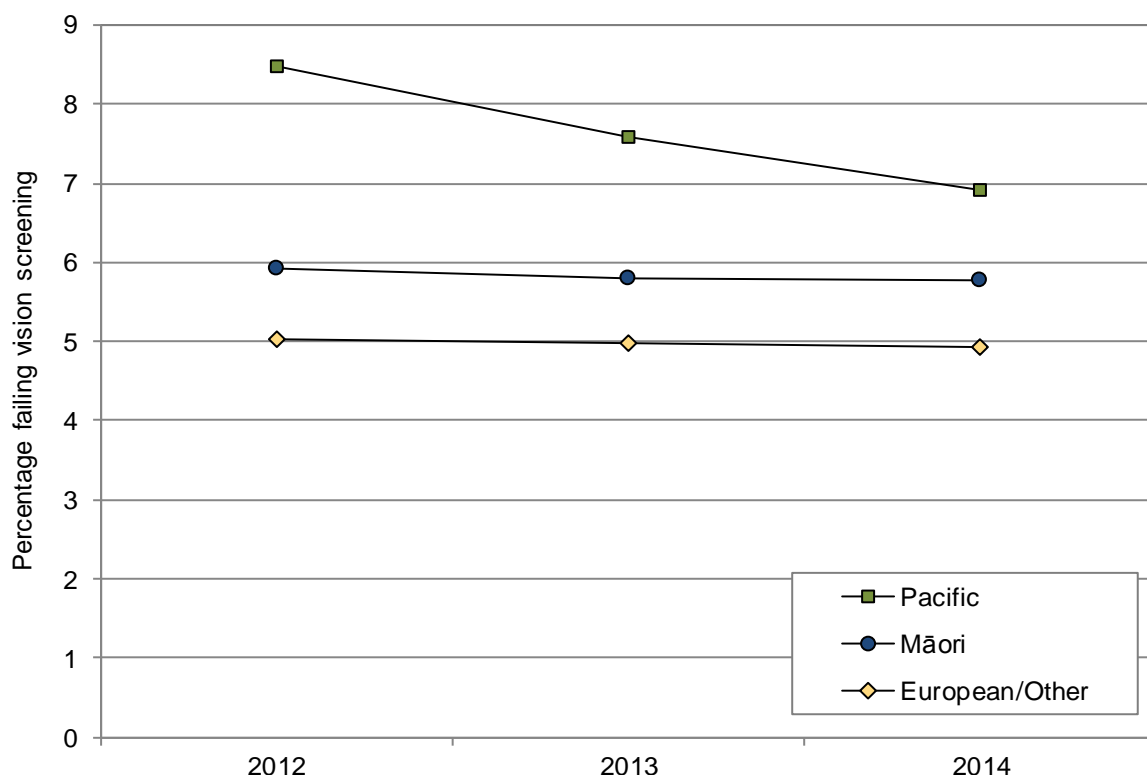
Source: B4 School Check Information System; Note: High deprivation is NZDep deciles 9–10, Low-Average deprivation is NZDep deciles 1–8

Trends by Ethnicity

In New Zealand during 2012–2014 (years ending 7 July), a *significantly higher* proportion of Pacific, than Māori, than European/Other children had an untreated visual acuity of 6/12 or worse in one or both eyes (**Table 34**). However rates for Pacific children declined during this period, while rates for Māori and European/Other children were essentially static (**Figure 124**).



Figure 124. Percentage of children not already under care who had a visual acuity of 6/12 or worse in one or both eyes by ethnicity, New Zealand B4 School Check years ending 7 July 2012–2014



Source: B4 School Check Information System; Note: European/Other includes European, Asian/Indian, MELAA, Other, and Not stated

Table 34. Children not already under care who had a visual acuity of 6/12 or worse in one or both eyes by ethnicity and NZ Deprivation Index decile, New Zealand B4 School Check years ending 7 July 2012–2014

Variable	Number: total 2012–2014	Number: annual average	Percent	Rate ratio	95% CI
Visual Acuity 6/12 or worse on one or both eyes					
NZ Deprivation Index decile					
Deciles 1–8 (low-average deprivation)	5,710	1,903	4.91	1.00	
Deciles 9–10 (high deprivation)	2,459	820	6.96	1.42	1.35–1.48
Ethnicity					
Māori	1,762	587	5.83	1.17	1.11–1.23
Pacific	1,077	359	7.59	1.53	1.43–1.63
European/Other	5,330	1,777	4.97	1.00	

Source: B4 School Check Information System; Note: European/Other includes European, Asian/Indian, MELAA, Other, and Not stated



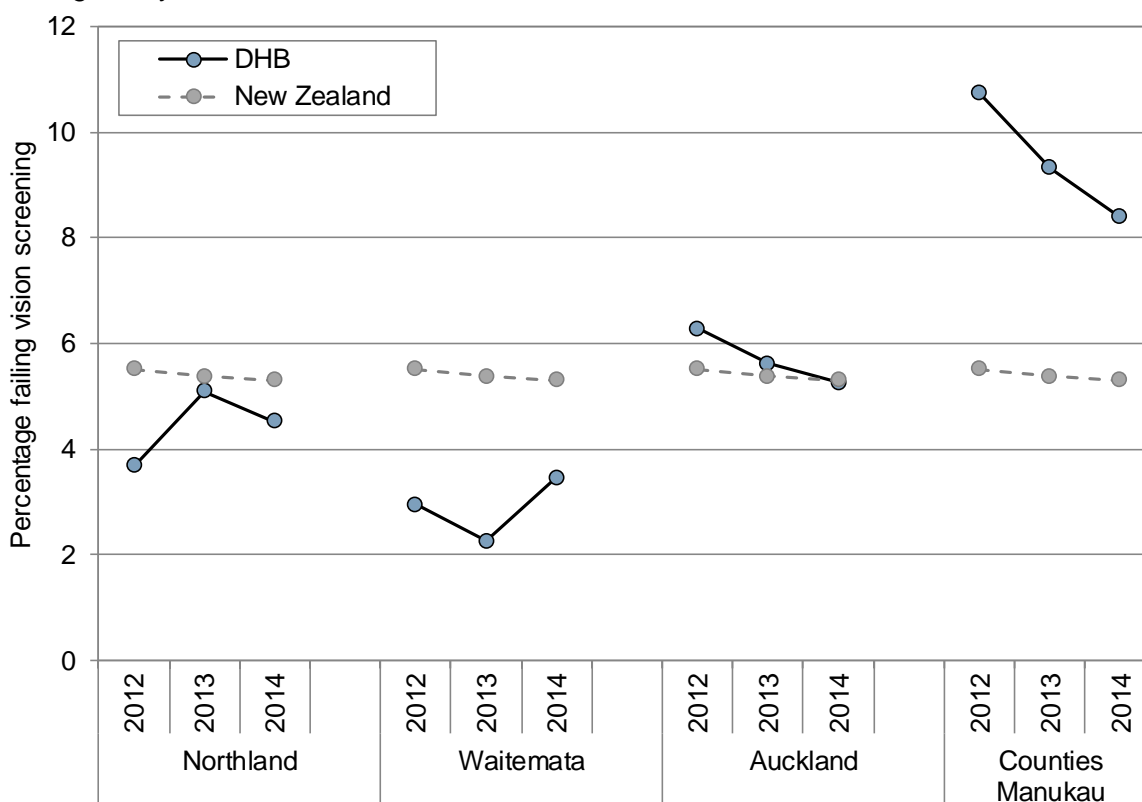
Northern DHBs Distribution and Trends

Northern DHB Distribution

In the Northland and Waitemata DHBs during 2012–2014 (years ending 7 July), the proportion of children not already under care who had a visual acuity of 6/12 or worse in one or both eyes was lower than the New Zealand rate, while in Counties Manukau the proportion was consistently higher. Rates in the Auckland DHB were similar to the New Zealand rate during 2013 and 2014 (**Figure 125**).

Note: Care should be taken when interpreting DHB vs. New Zealand differences or trends over time, as it is likely that many of these differences arise from local variations in service delivery, or the way DHB staff record information in the B4 School Check Information System, rather than from real differences in the prevalence of vision problems in the community.

Figure 125. Percentage of children not already under care who had a visual acuity of 6/12 or worse in one or both eyes, Northern DHBs vs. New Zealand B4 School Check years ending 7 July 2012–2014



Source: B4 School Check Information System

Distribution by Ethnicity

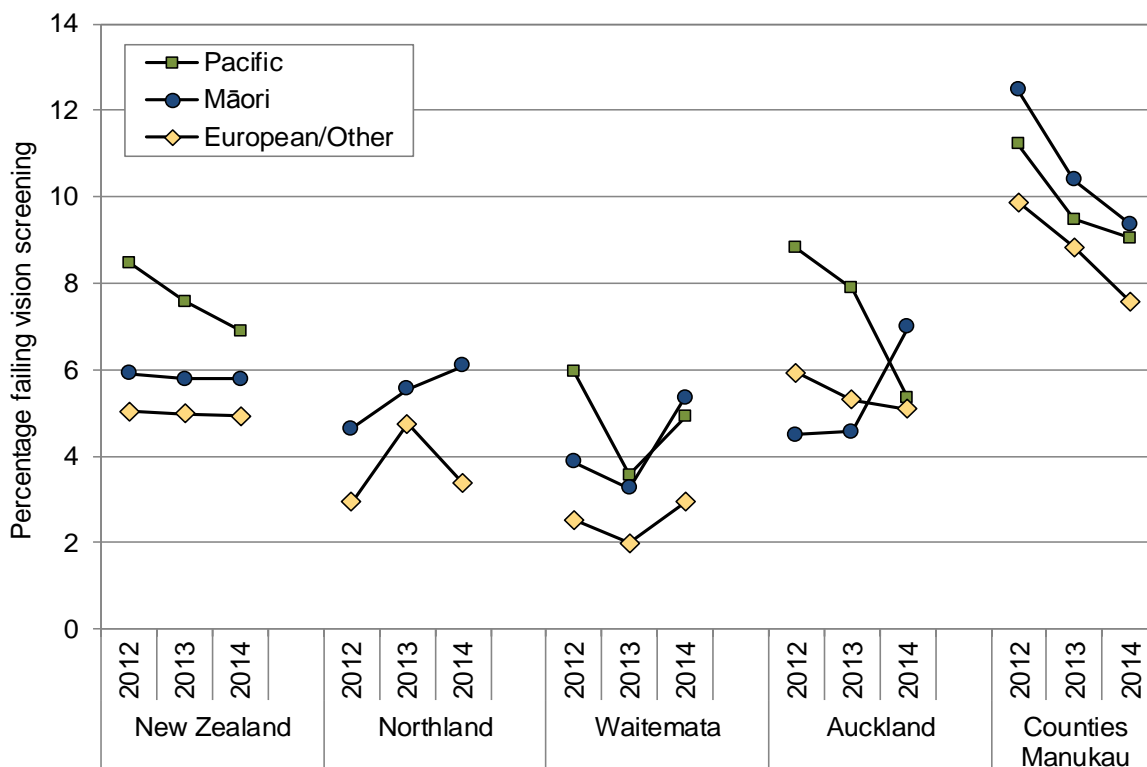
In the Waitemata and Counties Manukau DHBs during 2012–2014 (years ending 7 July), a higher proportion of Māori and Pacific children than European/Other children who were not already under care had a visual acuity of 6/12 or worse in one or both eyes, although there were no consistent ethnic differences in Auckland DHB. In Northland a higher proportion of Māori than European/Other children had a visual acuity of 6/12 or worse in one or both eyes (**Figure 126**).

Distribution by NZ Deprivation Index Decile

In all four Northern DHBs during 2012–2014 (years ending 7 July), a higher proportion of children from the most deprived areas (NZDep deciles 9–10 vs. deciles 1–8) who were not already under care had a visual acuity of 6/12 or worse in one or both eyes (**Figure 127**).

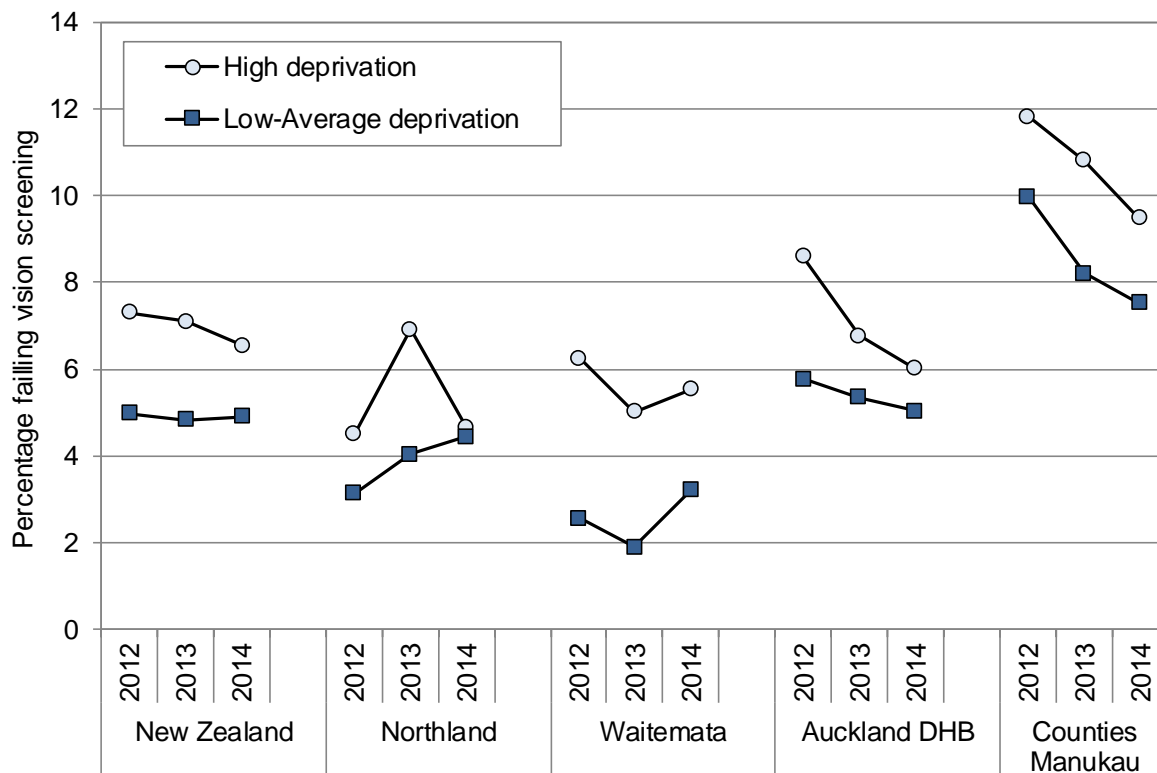


Figure 126. Percentage of children not already under care with a visual acuity of 6/12 or worse in one or both eyes by ethnicity, Northern DHBs vs. New Zealand B4 School Check years ending 7 July 2012–2014



Source: B4 School Check Information System; Note: European/Other includes European, Asian/Indian, MELAA, Other, and Not stated

Figure 127. Percentage of children care not already under who had a visual acuity of 6/12 or worse in one or both eyes by NZ Deprivation Index decile, Northern DHBs vs. New Zealand B4 School Check years ending 7 July 2012–2014



Source: B4 School Check Information System; Note: High deprivation is NZDep deciles 9–10, Low-Average deprivation is NZDep deciles 1–8

IN-DEPTH TOPIC: THE EFFECTIVENESS OF INTEGRATED SERVICES (HEALTH, EDUCATIONAL AND SOCIAL)

Introduction

Worldwide there has been a move towards more integrated service delivery models. This has in part occurred due to increased service demand, rising costs and staff shortages [256]. Brown and White [257] argue that organisations working in silos are unable to deliver services in the manner required by those that need them. They also highlight instances where a failure to work together has resulted in tragic consequences for children. In addition there are increasing expectations from the public for more co-ordinated service delivery.

De Vaus [258] also finds that there have been social changes that have created problems for families in accessing services. Some of these include:

- Services not being able to meet all the needs of families especially when these needs are complex
- Families have difficulties in finding out about and accessing services
- Services not being well integrated and therefore being unable to provide families with cohesive care
- Services having difficulties in tailoring care for families with diverse needs
- Services being funded on outputs rather than outcomes
- Government departments, research disciplines and service sectors working in silos.

This in-depth topic aims to provide an overview of the effectiveness of integrated services and how such programmes should be delivered to provide optimal benefit for children and their families. In doing so the review is divided into four parts. The first part provides a background and explanation as to what integrated services are and what they are trying to achieve. The second part considers evidence for the effectiveness of integrated services, both in New Zealand and internationally. The third part identifies factors needed for integrated services to be effective. The final part outlines how to implement effective integrated services in New Zealand.

What are integrated services?

Integrated services is one of the many terms that can be used to describe multi-agency working. Other terms include partnership working, inter-professional collaboration, co-operative practice, joint working, integration, interagency working, interdisciplinary working and trans-disciplinary working [259].

Specific aspects of integrated service delivery include organisations working together at an operational level, as the delivery of services may require the input of more than one agency [260]. This can result in unified management systems, pooled funds, common governance, whole of systems approaches to training, information and finance, single assessments and shared targets [261]. In integrated services there can be joint commissioning, unified management systems, shared prioritisation, service planning and auditing, and common governance ultimately leading to shared responsibility for achieving the goals of the service [261].

Models of integrated service delivery

There are multiple models for achieving integrated service delivery. In New Zealand, the Ministry of Social Development has described three types of integrated services [262]:



1. **Case management approaches:** In this model, a package of services from several different agencies is tailored to meet the needs of families. Joint assessment procedures are developed, as well as joint outcomes that take into account holistic needs. There is shared accountability and resourcing of services.
2. **One stop shops or single access points:** This model is based on the provision of a single access point to services, with the aim being to improve access to services for families, as well as facilitating referrals between services. One stop shops can be online as well as having physical access points.
3. **Joint funded service provision:** In this model, several agencies jointly fund a specialised service to meet a specific need. There are two common models of how this occurs. Either a lead agency administers and monitors funding from several agencies or providers, or agencies contribute to a single funding pool that is managed by a joint body. Agencies involved in joint service provision will develop joint service criteria, performance assessment frameworks and monitoring and evaluation processes.

There are many other models for integrated services [258]. These include steering groups, co-location of staff, virtual organisations, centre-based delivery, decision making groups, multi-agency panels, multi-agency teams, service hubs, community outreach and co-ordinated service delivery.

In addition to there being multiple approaches to service integration, there is also a continuum in the extent to which integration can occur [263]. One simplified description of this continuum is no integration, limited integration, partial integration and full integration, with the extent to which integration occurs depending partly on the needs of the users involved [262].

Integration of service delivery may be particularly appropriate when [262]:

- There are complex causes that cannot be addressed effectively by a single agency
- Local areas or groups are receiving a large range of services from different agencies and access and quality of services could be improved by agencies working together
- Agencies have overlapping priorities and concerns and collaboration could make the best use of resources
- Services are committed to common outcomes
- It is clear what each agency can contribute
- Agencies have the flexibility to put resources into the integrated service and the timing and local circumstances are favourable.

Potential benefits of integrated services

Integrated services have a large number of potential benefits, with one global survey that reviewed integration schemes across 22 jurisdictions finding potential benefits for both the service provider and the user [263]. From a provider perspective the survey found that integrated services could potentially increase capacity and provide value for money by reducing duplicated services, and enabling finances to be redistributed for actual service delivery. Integrated service delivery may also lead to improved strategic planning and system integrity as a result of better sharing of information between agencies, thereby enabling a greater understanding of user needs and outcomes, clearer identification of service gaps, and reduced fragmentation of services. As a result there was the potential to reduce future demand for crisis services such as hospital services. From a user's perspective, integrated services may potentially result in simplified access to services through the use of one stop shops and 'no wrong door' approaches. There may also be a more holistic understanding of clients' need through shared information, resulting in a more person-centred approach. Streamlining back-office functions and shared information also offers the potential for faster response times.



A literature review conducted as part of an evaluation of the Victorian Department of Education and Early Childhood Development children's centres found that service workers may become more knowledgeable of the array of services available and be more capable of delivering a wide range of services [258]. In addition the review found that there may also be increased understanding and trust between agencies, resulting in improved outcomes and potential for innovation. Through information and skill sharing there may also be innovation and streamlining of service delivery. All of this potentially resulted in the needs of the community being better met by services. Finally there was the potential for improved outcomes and users' experiences, thereby preventing families falling through the cracks in the system.

Why do New Zealand's children and young people need integrated services?

In New Zealand it is estimated that 285,000 children were living in poverty in 2013 [264]. There are strong associations between poverty and a range of negative outcomes across health, education, justice and welfare [265]. It is also likely that many families living in poverty experience multiple disadvantages, with some having multiple and complex needs which traditional approaches may not be able to meet.

Three qualitative studies on how families experiencing disadvantage access support services have been reviewed by the Office of the Children's Commissioner's Expert Advisory Group (EAG) on Solutions to Child Poverty [265]. The EAG found that families experiencing multiple disadvantage were more likely to engage with services if relationships were built on trust, mutual respect and continuity, if services were universal and non-stigmatising, if all the family's needs were addressed, if services were culturally appropriate and based in the community, and if they used existing links and relationships to access services.

The importance of inter-agency collaboration is often most visible in the area of child protection [266]. Meaningful collaboration in this area is essential for child protection services, family support agencies and other social services to meet the needs of children and families. The failure to share vital information can result in decisions being made about a child in isolation, resulting in a poorly planned intervention that may not be effective.

The Child and Youth Health Compass Report, commissioned by the Children's Commissioner [267] identified one of the most critical barriers to delivering child and youth services was the lack of planning and co-ordination. This report utilised DHBs' responses to a questionnaire containing open ended questions about a number of child and youth service domains. The lack of planning and co-ordination was felt to result in agencies planning in silos, competing with each other, creating crowded and conflicting agendas and not taking account of what was happening locally. In particular it was felt that advice was needed on how to reduce fragmentation between local providers.

The effectiveness of integrated services

While such reviews clearly demonstrate the need for well integrated services, particularly for the families of children and young people with multiple and complex needs, the way forward in terms of implementation is by no means clear. The following sections therefore review examples of integrated service delivery in New Zealand and overseas, with a view to identifying effective models which might be adapted for use in the local context. The programmes described are those for which information was readily accessible and evaluation information available. They do not constitute an exhaustive list of all of the integrated services currently available. As per the Ministry of Social Development's classifications, the programmes have been grouped into three categories: case management approaches, one stop shop/single points of access and joint funded service provision.



The limitations of integrated services evaluations

Before considering the findings of individual studies, it is important to note that evaluating the effectiveness of integrated services is inherently difficult. Identified barriers to evaluation include structural, practical, cultural and methodological factors [268]. The usual methods of evaluation may not be sufficient to identify improved user outcomes as a result of integrated services.

Existing evaluations of integrated services tend to use one of three approaches to measure outcomes [269]. These include structured surveys of users or professionals (or both), interviews and/or focus groups with users or professionals or both and multi-methods approaches which combine both of these methods. These approaches are also often supplemented by in depth analysis of supporting documents such as meeting minutes, monitoring reports, project plans and usage statistics.

Interviews and focus groups can obtain information on how the collaboration is working, whether there is satisfaction with how services are being delivered and where improvements might be made [269]. However, if only those who are satisfied enough with the service to continue engaging take part in the evaluation this may lead to biased findings, as such surveys cannot provide any insights into the views of those that dropped out, or did not use the service from the outset because it did not meet their needs.

Systems outcomes or usage statistics have also been used to assess whether integrated services have led to improvements for users [269]. Objective measures such as the number of sessions offered, attendance figures, waiting times and caseloads may identify improvements in the efficiency of integrated services. Such information however, provides no insights into whether outcomes for users have improved or whether the service has actually been effective. As a result, many more studies have measured the perceived impact of integrated services than have attempted to assess measurable outcomes [270]. These limitations need to be borne in mind when reviewing the evidence arising from the case studies below.

New Zealand examples

Historical and policy context

Integrated service delivery stems back to the 1990s when the New Zealand Employment Service, the Community Employment Group, the Local Co-ordination Unit of the Department of Labour and the Income Support group of the Department of Social Welfare were merged to establish the Department of Work and Income as a case study of integrated service delivery [265]. Shortly after this, *The Report of the Advisory Group on the Review of the Centre* found that while the public management system provided a reasonable platform, there were shifts that needed to be made to meet the needs of citizens [271]. Areas for attention included:

- Achieving better integrated, citizen focused delivery
- Addressing fragmentation and improving alignment
- Enhancing the people and culture of the state sector.

Following this report, the Integrated Service Delivery: Regional Co-ordination work stream was formed to suggest how government agencies could work better together and with local stakeholders. In their report, *Review of the Centre Integrated Service Delivery: Regional Co-ordination*, the authors concluded that further policy work was needed and *Mosaics. Whakaahua Papiriki: Key findings and good practice guide for regional co-ordination and integrated service delivery* was published [260,262]. This was followed in 2008 by the State Services Commission publishing a document intended to enable agencies to improve co-ordination with each other [272].

More recently, the release of the Government's Better Sooner More Convenient policy in 2009 focused attention on changing service delivery arrangements to better integrate primary healthcare. The policy aimed to create an environment in which community health



professionals were encouraged to work with each other and with hospital-based clinicians to deliver health care in a co-ordinated and co-operative manner [273]. However, this policy mainly focuses on the clinical health sector and therefore may not include other sectors such as education or social services.

In addition, the Better Public Services Programmes introduced in 2012 aims to provide better results and improve services with an ongoing focus on value for money and innovation [274]. Government agencies in all areas will be required to work more closely with each other and to organise themselves around the results. Functions and services will need to be shared, including purchasing goods and services and developing systems. Agencies will also need to improve how they measure and report performance and have a greater responsiveness to New Zealander's needs.

Within these broader historical policy frameworks a range of integrated initiatives have evolved. The following sections reviews a selection of these initiatives, with the focus being on those that have been well documented and evaluated (to a variable extent) over the past twenty years.

Case management approaches

There are a number of initiatives in New Zealand which currently use a case management approach to deliver integrated services. While Strengthening Families has been in place since the 1990s, Whānau Ora is still fairly new and Children's Teams are currently being implemented.

Strengthening Families (SF)

Strengthening Families (SF) is a programme led by the Ministries of Health, Education, Social Development and Justice [266]. It formalises collaborative case management when more than one agency is involved with a child or young person and their family. A collaborative network of agencies from the government, community and voluntary sector work with children, young people and families who are experiencing multiple problems. The model was first piloted in 1996 and was rolled out across the country in 1999.

Local management groups (LMGs) comprise representatives from local government, government agencies, iwi and not-for-profit social sector organisations. Local case co-ordinators usually undertake the co-ordination of case management and become the main point of contact for the family. They also promote SF in the community, liaise between families and agencies during the case management process, assist with the training of facilitators and report back to the LMG.

Families must agree to the case management process at a case management meeting, and will have an involvement in deciding which agencies will be involved, the formulation of a plan, goal setting and allocation of tasks.

A number of studies and evaluations have been conducted on SF. Most, however, have not looked at outcomes for children or families but have focused on the processes involved and perceptions of the providers and families. This review will focus on a limited number of these evaluations.

Oliver and Graham held in-depth interviews with 38 clients selected by SF co-ordinators or lead agents in six SF sites [275]. Most of the clients had been involved with SF for a prolonged period of time and there was potential for recruitment to be biased towards those continuing to engage with the service. Families felt that SF increased the likelihood of agencies co-operating with each other, increased the likelihood of identifying families' actual problems, provided a forum for allowing agencies to acknowledge problems and had the potential to keep agencies accountable for service delivery.

In another review, the Ministry of Social Policy summarised the information in 154 SF final meeting forms received between 2000–2001 [276]. These forms were completed by the lead agency and were based on the consensus of those involved in the final case collaborative meeting. They suggested that families experienced a boost in morale and optimism that a service would be able to meet their needs and the process allowed parents



to become more confident in approaching services. They also suggested that families felt meetings were held at times convenient for them, they were mostly listened to and agencies understood what was important to them. Agencies felt that SF had provided greater support for families, allowed an improvement in the behaviour of the child or young person, produced an improvement in the wellbeing or safety of the child or young person and allowed further assessment or monitoring of the child or young person [276].

Te Puni Kokiri used a mixed methods approach in an audit of SF [277]. This included a review of case management documentation, interviews with LMG's and co-ordinators, a Māori community hui for those working with families at risk and interviews with lead agents, clients and national operations managers. Agencies felt that greater agency accountability was needed within the case management process and agencies needed to follow through on commitments that were made [277]. Half of the Māori clients felt that the objectives in their action plans had been achieved, although a third of Māori clients felt that objectives had not been met. Whether Māori clients perceived there to be a positive outcome depended on how realistic the plan's goals were, how willing the family members were to participate and commit to the process, how committed the agencies were to the plan and how responsive providers were to their needs. The majority of clients interviewed felt that they would go through the process again and recommend the process to others. Māori Communities felt that the level of knowledge and understanding of SF was variable and that Māori may be reluctant to participate in case management due to fears that privacy would be compromised and that they would be further disempowered. Generally there was support for the concept of collaborative case management although it was felt that Māori should also be involved in the delivery of the service. They also suggested that key SF contacts should be promoted at the community level.

Another review in 2005 involved meetings with Local Management Group members, co-ordinators and other stakeholders in a number of regions [278]. In addition, 22 submissions were written by co-ordinators, local management groups and other parties in response to a letter asking for feedback on key issues. The review found there were a number of issues with the initiative. These included variable effectiveness of local management groups, under-resourcing of case management, and a need for improved professional development for co-ordinators and facilitators, more consistent and stable conditions for the provision of co-ordination services, and stronger monitoring and feedback loops.

While these reviews all provided insights into the implementation of SF, including the satisfaction of clients and staff, none included the views of families who had chosen not to engage with SF, nor the reasons for their non-engagement, and none compared the actual outcomes of SF families with those not receiving the service.

Whānau Ora

Whānau Ora is a Government initiative that takes an inclusive approach to providing services and opportunities for whānau in New Zealand [279]. It is jointly implemented by Te Puni Kokiri and the Ministries of Social Development, Health and Māori Development [280]. It involves Whānau Ora health and social services providers delivering wrap-around services through a Māori Community Worker, tailored to meet the needs of whānau. It aims to empower families as a whole rather than focusing on individuals and their separate problems.

Key characteristics of Whānau Ora [279]

- Whānau taking responsibility for whānau
- Whānau being at the centre to lead the development of solutions for their own transformation
- Building on whānau strengths and capability
- Whānau-centred services that are shaped by Te Ao Māori values and philosophies
- Freeing up health and social service providers from the dozens of separate contracts that currently tie them up
- Greater co-ordination across government agencies and providers at the local level
- Coherent, relevant and connected whānau service delivery approaches



The rationale for Whānau Ora

Prior to establishing Whānau Ora, a case study approach was taken to illustrate its key features and to describe and define the term 'Whānau Ora integrated service delivery' [279]. This approach involved interviews with six Māori health providers and a review of key information sources. In the review, integrated funding was seen as an important component of integrated service delivery. It was felt that the pre-existing funding model did not facilitate a collaborative or integrated approach. Programmes were often started in isolation from other services and incurred transaction costs for reporting requirements. Providers wanted existing contracts to streamline accountability and reporting arrangements. Funders also needed to provide a degree of flexibility when having a focus on outcomes.

All providers felt that services prior to Whānau Ora were about whānau [279]. Services were therefore designed and delivered to meet this goal in close consultation with iwi and whānau. As the majority of whānau had complex needs, it was felt that the service paradigm needed to meet these needs in a comprehensive way. Front line staff often demonstrated this by spending large amounts of time with whānau making referrals, acting as brokers and having a degree of direct contact they were not necessarily contracted for. The evaluation however, was unable to determine whether all providers were providing whānau-centred services in the manner described by the taskforce on whānau-centred initiatives.

The same case study found that while one of the main aims of multi-disciplinary teams was to meet complex needs, not all providers had managed to achieve this [279]. Some of the providers had established strong alliances with other health and social service providers. Capacity and capability however was a limiting factor for some of the providers, who also felt that these requirements placed pressure on them.

The findings of this review were used to inform the development of the Whānau Ora model, which has a three tier operational framework which includes:

1. **A Whānau Ora Governance Group:** This governance group is responsible for the overall implementation of Whānau Ora. Membership includes the chief executives of Te Puni Kokiri and the Ministries of Social Development and Health, plus three community representatives [280].
2. **Whānau Ora Leadership Groups:** These 10 Leadership Groups are defined by Te Puni Kokiri's regional boundaries [280]. They provide regional strategic leadership, foster local communications and relationships and ensure there is co-ordination with other local and regional services. Members include between three and seven community representative plus three officials from Te Puni Kokiri, the Ministry of Social Development and local District Health Boards.
3. **Whānau Ora Collectives:** These collectives are spread throughout the country with a view to developing whānau centred services [280]. Programmes of Action outline the changes that collectives are aiming to make to their service delivery models and the steps that need to be taken to implement these. Collectives have developed navigational approaches where practitioners work directly with whānau to identify their needs, develop plans to address them and broker access to required services. Māori Community Health Workers are central to this and have a number of different roles and responsibilities including health promotion, advocacy, liaison and cultural support [281].

Supporting these initiatives is the Whānau Ora Integration, Innovation and Engagement (WIIE) Fund, which assists whānau led development and supports whānau and families to engage with each other and other whānau, communities and providers [280]. Activities funded include developing whānau plans, implementing priority parts of the plans, producing information and resources and supporting whānau-based initiatives.

In addition, an information collection trial has collected data on whānau and service transformation in order to measure early results for Whānau Ora [282]. This trial has included a Whānau Ora satisfaction survey involving 51 whānau, representing 235 individuals from three collectives and the completion of a report template about whānau



results and services. The trial has found that whānau have high levels of satisfaction with the services and support they have received, which have led to positive changes for whānau members. The satisfaction survey found that 78% agreed or strongly agreed that working with provider collectives improved the amount of exercise they did, 84% agreed or strongly agreed that they had more confidence in parenting/caregiving and 77% agreed or strongly agreed that they had an improved housing situation.

Other possible evaluation frameworks have been described [279], with one suggesting that the main elements of any framework should include: whānau, hapū, iwi and Māori communities; personnel; effective health and disability services; and working across sectors. Indicators of short term outcomes and possible evaluation methods have also been described for each of these elements.

An evaluation has also been performed on the Whānau Ora Wellbeing Service of Te Whakaruruhau Women's Refuge which provides safe housing, support and advocacy to women and children [283]. The evaluation was based on ten case studies of clients, interviews with staff and key informants in allied agencies, as well as participant observation of activities. The evaluation suggested that the programme had led to enhanced interagency collaboration, especially with Child, Youth and Family. The described programme's outcomes were quite individualised given the methodology but highlighted improved physical, psychological and emotional health, feeling more competent and better resourced as a parent, successfully addressing drug and/or alcohol abuse, becoming financially independent, obtaining housing and feeling safe.

The small number of formal evaluations, however, means that it is still too early to assess the overall effectiveness of Whānau Ora. The limited information that is available suggests that the model is viewed favourably by some engaging with its services.

Children's Action Plan and Children's teams

The Children's Action Plan arose from the White Paper for Vulnerable Children 2012 [284]. The Action Plan outlines the Vulnerable Children's Act 2014, which includes provisions for information sharing, processes to track vulnerable children, tougher penalties for, and the monitoring of, child abusers, screening those that work with children, a free child protection phone line, public awareness campaigns and local children's teams.

Children's teams are intended to bring together professionals from different sectors e.g. health, education, welfare and social service agencies to work with vulnerable children and their families. The model is that a group of senior professionals from the community meet regularly and appoint a lead professional to work with a specific child and their family. A unique children's team is formed to meet the needs of each child and family [285].

The service design is developed locally and needs to identify how the children's team integrates into the local community, draws on existing services, aligns with other government initiatives and meets the needs of vulnerable children and their families. So far, children's teams have been piloted in Rotorua and Whangarei and subsequently implemented in Horowhenua/Otaki and Marlborough with implementation in 2015 planned for Hamilton City, Clendon/Manurewa/Papakura, Gisborne, Whakatane, Whanganui and Christchurch.

To date the design and implementation of Children's teams have been assessed using a developmental evaluation approach, with data being collected through observation, document review and semi-structured interviews with key personnel. The assessment also included a two day cross-sector Children's Action Plan workshop involving 140 people [286]. Five critical components for the Children's team model were established namely: planning and development, partnership, implementation, systems change and scaling up [286]. The review also found there had been positive progress on some elements such as building a shared vision, collective ownership and building a working model. However, funding and accountability processes posed challenges. It was also thought that workforce capacity, common accountability measures and addressing service gaps were likely to need more attention.



The Ministry of Social Development has also developed a set of tools for working in integrated programmes called Investing Service for Outcomes” (ISO) and has a Strategic Investment Framework to support initiatives like the Children’s Action Plan [287].

One stop shops or single access points

A number of one stop shops or single access point type services have been implemented in New Zealand, with many tailored to the needs of specific age groups.

Early Years Service Hubs

Early Years Service Hubs, established in 2006, are located in high needs areas to provide a central location for access to services for families with children from before birth to six years of age, with the aim of improving outcomes for this age group [288,289].

Components of Early Years Service Hubs

Access to universal services and support that help families to raise their children

Easy access to information and advice

Access to community-based formal and informal support networks

Access to quality, specialised services to meet additional needs

Effective, co-ordinated, intensive, protective and remedial services when children continue to be vulnerable to poor outcomes

The seven core services that are connected through Early Service Hubs are ante-natal services, Well Child Tamariki Ora, early childhood education, parenting information, education and support, home visiting, referrals to off-site services and outreach [289].

An evaluation of these service hubs was undertaken which comprised site visits to five hubs, interviews with hub managers, co-ordinators and Family and Community Services regional office staff, focus groups and interviews with core service providers, a survey of other service providers connected to the hubs, focus groups and interviews with a small sample of service users and analysis of Hub strategic and operational documentation [290]. The evaluation found that community relationships had been built and strengthened and that there was an increased awareness about services. In addition there was increased collaboration between service providers, with the identification of service gaps and possible solutions for these. Key factors leading to successful implementation included good community consultation and partnership, early appointment of co-ordinators and the identification of high quality host organisations.

School-based health services (SBHS)

There are many different organisational arrangements for school-based health services [291]. Some schools employ their own nurses and develop wellness centres providing a range of services. Others have visits from public health nurses, family planning nurses and general practitioners, while others have no services at all [291,292].

There have been two evaluations of SBHS in New Zealand, of which the Healthy Community Schools Initiative in Achievement in Multi-Cultural High Schools (AIMHI) schools was one. AIMHI was a pilot programme funded by the Ministry of Education established in 1996 to explore how achievement in nine schools could be enhanced. The goal was to improve educational outcomes by:

- Increasing effective learning time
- Reducing barriers to learning
- Improving health and social services within the school
- Gaining greater connectivity and congruency of the school with its community

The initial evaluation during 2002–2004 found that students expressed greater satisfaction with their schools, felt better supported to achieve and felt that ethnic diversity was more supported [290]. A second evaluation during 2008–2009 found that health and social services varied considerably between the schools [293]. However, it was felt that the support services increased students’ access to health and social services with a positive



impact on their educational achievement. Both students and staff felt positively about the services.

The second evaluation of New Zealand's SBHS was a review of the School Nursing Services [291]. This review concluded that New Zealand's SHBS were developed in an ad-hoc fashion resulting in discrepancies in the availability of and access to services. For more details on both of these evaluations see the in-depth topic on this issue in 'The Health Status of Children and Young People in New Zealand 2011' [294].

A specific example of a School-Based Health Service or Hub in New Zealand is Victory Village [295]. This resulted from a partnership between Victory Primary School and Victory Community Health. Health services, recreational and social programmes and community events are provided through a multi-purpose community health and recreation centre located on the school grounds. Through collaboration across sectors a wrap-around approach is provided to families with complex needs.

A case study review was undertaken involving Victory Village [295]. Data were collected between 1997 and 2009 through interviews with key personnel, staff and family groups, a survey with 13 teachers, photovoice research activity with students, and data associated with academic achievement, participation, success and wellbeing which was collected by the school. The photovoice research activity consisted of participants taking photos of people, places and things of significance to them, followed by discussion of the photos with the researcher and a group of participants. While attendance and achievement in literacy and numeracy had improved since 2000 the methodology did not allow a causal association between the SBHS and these outcomes to be made. However, students were reported to be motivated, having strong self-efficacy and positive relationships with teachers. Families also felt they had better access to services and improved health and wellbeing. The community felt more engaged and had stronger connections with families. Providers felt they were providing better services as they had a more collaborative and holistic approach in place.

Youth One Stop Shops (YOSS)

YOSS are facilities based in the community that provide a range of services to young people and which take a holistic approach within a youth development paradigm [292,296]. Services may include primary healthcare, family planning, social work, youth development programmes and recreation programmes [292]. Services at YOSS are provided free of charge or at a reduced cost [296].

A New Zealand evaluation of 12 YOSS combined a literature and document review with surveys of YOSS managers, as well as site visits to meet managers, staff and stakeholders and to undertake focus groups with clients [296]. The review found that the majority of clients accessed YOSS services opportunistically, depending on their situation and often used other providers as well. It did not collect any data on the effectiveness of YOSS in improving access to services. However, all YOSS worked to reduce the barriers to accessing services faced by young people. They did this through multiple strategies including flexible opening hours, outreach, central locations with access via public transport, youth-friendly settings and services being at low or no cost. No data was included to evaluate whether health outcomes for young people had improved, however, 89% of stakeholders and 94% of clients agreed that services were effective at improving the health and wellbeing of young people. Due to the lack of comparable data for those not using YOSS services it is difficult to assess whether YOSS were meeting the needs of all those in their catchment areas or just those that had registered with the service.

A more detailed review of YOSS can be found in the in-depth topic on this issue in the 'Health Status of Children and Young People in New Zealand 2011' [294].

Jointly funded service provision

Social Sector Trials

The Social Sector Trials (the Trials) are being set up to test a new approach to social service delivery [297]. The approach focuses on a set of outcomes for a target group with



a reorganisation of funding and decision-making processes and a shift towards controlling service delivery at the local level. The target group are those aged between 12 and 18 years, with the aim being to improve success in the following high level outcomes:

- Reducing truancy
- Reducing offending
- Reducing alcohol and drug abuse
- Increasing participation in education, training or employment.

Each outcome has a number of associated targets against which progress can be measured. Intermediate outcomes have also been identified. These include increased engagement in school, improved engagement and positive role models, improved engagement/connection with community groups and events, a more supportive community environment, improved responsiveness within the community to the needs of young people, more young people getting the services or programmes they need, and better transitions from school to training and employment.

Through a partnership between the Ministries of Social Development, Justice, Health, Education and the New Zealand Police, decision-making processes and funding are spread across the social sector [297]. The cross-agency funding contributes to the support and administration of the Trials, transferring relevant contracts to the control of Trial leads, funding new initiatives and contributing resources 'in-kind'.

Governance is through a National Level Joint Venture Board (JVB) with local governance groups to support the planning and implementation of trial activities. Local governance groups include young people, the Mayor, school principals, police, iwi, government agencies and community leaders.

The operating model consists of a 'Trial Lead' whose role is to facilitate service delivery at the local level by supporting the decision-making of the stakeholders involved. The Trial Lead is charged with building networks and strengthening co-ordination amongst government and community stakeholders.

Key aspects of the local governance groups that support the Trials include:

Having a high status local stakeholder that give visibility and a mandate to the group

Having membership from across key stakeholder groups that bring a wide range of perspectives and spread ownership of the Trials across multiple agencies

The ability to operate with high trust

Having regular meetings focusing on joint actions that lead to a better understanding of other organisations' business

An evaluation of the Trials utilised stakeholder interviews, youth interviews, documentation reviews, surveys, observations, monthly reports, significant change stories, and financial data [297]. It found that the Trials have improved collaboration between local organisations, NGOs, local and central government agencies. Importantly they have provided a platform for networking and relationship building between community stakeholders. Through improvements in cooperation and collaboration service delivery is more co-ordinated for young people and their families.

The evaluation also found increased community collaboration and responsiveness to the issues faced by young people. Through increased information sharing, community organisations were able to proactively identify issues and gaps and develop tailored solutions.

There was also a broader base of new and improved services aimed at young people. The services ranged from high intensity services involving one on one case management, through medium intensity services to low intensity services such as programmes for a large group of people. These services were also delivered in a more co-ordinated manner.

Stakeholders felt that there were positive results for many young people as a result of the Trials. They identified changes in behaviour, attitude, improved confidence and motivation.



Young people interviewed for the evaluation reported an improved sense of belonging and increased feeling of responsibility for those around them.

Key factors that enabled the successful establishment of the Trials included national leadership and an on-going close and direct link between the JVP and front line operational staff [297]. This included the ability to escalate issues from an operational level to a governance level and to overcome blockages that could not be resolved locally. A clear structure, processes and roles at both the local and national levels, and an action plan that reflected the communities' need and intended outcomes were also identified as important. In addition, secure funding and resources, high quality local leadership that was able to work collaboratively, and shared responsibility for the Trials across key community stakeholders were all key success factors.

Key barriers associated with the Trials were identified. These included difficulties in obtaining relevant outcome data, the integration of funding, multiple government initiatives and priorities, ensuring joint governance and ownership of Trials at agency level and the narrow scope and focus of the Trials [297]. Being able to obtain locally relevant outcome data was a particular challenge but was seen as being essential to measuring the impact of the Trials in the future.

Summary: New Zealand examples

There are a number of integrated services in New Zealand. However, the evaluations of these services have either been limited in scope, or the services themselves have not been established long enough for effective evaluations to be undertaken. There is, therefore, a need to also look at international examples of integrated services and to review the evidence for their effectiveness.

Overseas examples

Case management approaches

Victoria Child FIRST and Integrated Family Services

In 2007, the enactment of the Children and Youth Families Act 2005 provide the legislative basis for developing Child FIRST and Integrated Family Services in Victoria, Australia [298].

The aims of Victoria Child FIRST and Integrated Family Services are to:

- Co-ordinate and provide a visible point of access to integrated family services
- Provide capacity to receive referrals, undertake assessments and assist with the provision of services to vulnerable children
- Provide a platform to drive stronger governance and responsibility between services
- Provide appropriate targeting and prioritisation of services to more vulnerable children, young people and their families

Child and Family Service Alliances were established in each sub-region with members from the Integrated Family Services, Child FIRST, DHS Policy and Partnership staff and Child Protection. The alliances were responsible for the operational management, catchment planning and providing service co-ordination.

A community-based child protection position was also created to facilitate referrals between Child FIRST and child protection, as well as to provide secondary consultation and advice [298]. The role also involved undertaking joint visits, joint case management, participating in allocations meetings and educating staff about relative roles and responsibilities.

A review of Child FIRST and Integrated Family Services was informed by a mixed method approach [298]. This review utilised a case study analysis (including documentation analysis, stakeholder consultation and analysis of administration data), analysis of family services and child protection data, an evaluation survey of 1,149 members of child and family services, regional and state-wide consultations, interviews, forums and workshops.



The review found that the introduction of Child FIRST and Integrated Family Services resulted in an increase in referrals from a range of professional sources when compared to the period before the initiative was implemented [298]. There was also an increase in accessibility to services with more families receiving services. Children and families receiving services were more likely to have more complex needs identified than previously. While there was evidence of more co-ordinated intake, allocation, service delivery and demand management, challenges to co-ordination still remained which reflected the lack of a common assessment framework. This reduced consistency in determining children and families' eligibility to services and the ability to prioritise the most vulnerable in the catchment.

The Alliances were found to be successful in creating a shared responsibility for service delivery, a mechanism to support consistent intake, prioritisation and allocation based on need and risk [298]. They also provided an opportunity to consistently improve service provision as well as the capacity for joint planning, and a shared approach to demand management.

The community-based child protection position was able to improve information sharing, provide comprehensive and accurate risk assessment and prioritisation, provide greater capacity to manage increased risk and complexity, divert and minimise the progression into child protection and improve working relationships between Child Protection and Integrated Family Services [298].

Every Child Matters, UK

There are three elements to the Every Child Matters programme [299]. These are a common assessment framework (CAF), a lead professional, and information sharing. The CAF is a framework to enable professionals to assess a child's and family's need for services. Following this assessment the lead professional is responsible for the co-ordination of actions identified by the CAF. They also act as a single point of contact for a child and their family. A Team Around the Child (TAC) is formed from practitioners across different services to provide a multi-agency response to deliver the actions. Members of the TAC are jointly responsible for the delivery of the plan to meet the needs of the child and family, with a working definition for the approach being as follows [258]:

'The TAC approach has been designed to provide effective, timely and seamless support for children and young people with complex needs and their families. It supports child and young person-focused family-centred planning and provides each child and young person with their own individual, collaborative team of practitioners.'

In a literature review on integrated working, Oliver et al. found there was considerable variability in how the TAC model had been applied by local authorities in the UK [300]. However, professionals perceived it as helping to keep the focus on the young person and to improve accountability and transparency among services working with young people. It was also felt to maintain a consistent and co-ordinated level of support for young people, improve access to services and reduce duplication of the services provided. For professionals there was an improved understanding and awareness of other professional roles and services resulting in a reduction of inappropriate referrals. The majority of this evidence is anecdotal however, with a lack of systematic recording of outcomes for young people.

One stop shops or single access points

Sure Start, United Kingdom

The Sure Start initiative was introduced in the UK in 1999 as part of the Government's policy to prevent social exclusion [301]. Its aim was to enhance the life chances of young children growing up in disadvantaged areas [302].

Initially Sure Start Local Programmes (SSLPs) were situated in deprived areas with all under five year olds and their families being able to access the programme. There were four key aspects of SSLPs that made them different to previous programmes [303]: The programmes:



- Were outcomes driven with accountability organised around outcomes
- Involved transformation of service delivery, ensuring multi-agency partnership and co-ordinated planning and delivery of services
- Involved communities who were empowered throughout the programme
- Were area-based with universal access in the areas.

Local communities were able to develop services according to local needs, with some of the services offered including personal development courses, support for debt counselling and language and literacy training. The box below outlines the core services delivered by these SSLPs

Core services delivered by Sure Start Local Programmes [301]

Outreach and home visiting
 Support for families and parents
 Support for good quality play, learning and childcare experiences
 Primary and community healthcare and advice about family health and child developments
 Support for people with special needs

Adaptations to the Sure Start initiative have evolved as national and local priorities have changed. Initially between 1999 and 2003 there were 524 SSLPs targeting populations living in the most deprived areas in the UK [268]. In 2004 the Sure Start initiative was rolled out over the entire country, with SSLPs becoming Sure Start Children's Centres (SSCCs) and with new SSCCs emerging. In 2010 the government moved away from a universal Children's Centre model to focus on targeting the services to the most vulnerable children and families.

A number of evaluations of Sure Start have been undertaken at both the local and national levels [268]. Each SSLP is required to conduct a locally led evaluation of its services each year, although as each SSLP was able to decide what was to be evaluated and when, the approaches taken have varied across the country.

At the national level, the National Evaluation of Sure Start (NESS) has comprised five different modules: impact, implementation, local context analysis, cost effectiveness and support for local programmes. More details and a full explanation can be found at www.ness.bbk.ac.uk. The NESS impact evaluation used an integrated cross-sectional, longitudinal framework. The cross-sectional phase used 150 Sure Start and 50 control communities, measuring outcomes for infants, two year olds and four year olds and their families and communities [304]. A longitudinal phase of the study followed the infants in the cross-sectional phase when they were 3, 5 and 7 years old and compared them with children in the Millennium Birth Cohort Study.

For the 9 and 36 month old children there was limited evidence that SSLPs achieved their goals of increasing service use or enhancing families' impressions of their communities [305]. There was also limited effect on child outcomes. However, SSLPs did appear to be beneficial to family functioning. The evaluation found that there were diverse effects on subpopulations, for example, children and families who were relatively less disadvantaged seemed to benefit from SSLPs whereas those children and families who were relatively more disadvantaged were adversely affected. For example, 36 month old children of teen mothers showed less verbal ability when in SSLP communities compared to controls, and similar findings were reported for children of workless or lone parent households. However, non-teen mothers reported less negative parenting in SSLP areas and children exhibited fewer behavioural problems than those in control areas.

At three years old, overall, parents showed less negative parenting and provided their child with a better home learning environment. Children also had better social development with higher levels of positive social behaviour and independence/self-regulation. Health outcomes included higher immunisation rates and fewer accidental injuries [306].



At five years old children in SSLP areas had lower BMIs than those in non-SSLP areas due to being less likely to be overweight, with no differences in obesity [307]. Children in SSLP areas also experienced better physical health than children in non-SSLP areas. Maternal outcomes included being able to provide a more cognitively stimulating home learning environment for their children, providing a less chaotic home environment, experiencing greater life satisfaction and engaging in less harsh discipline. However, mothers also reported more depressive symptoms and parents were less likely to visit the child's school for parent/teacher meetings or other arranged visits.

At seven years old significant effects included mothers reporting engaging in less harsh discipline and providing a more stimulating home environment for children [302]. In specific populations there were less chaotic home environments for boys and better life satisfaction for lone parents and workless households. It is thought that these effects are fairly limited due to the large number of outcomes for which there were no effects [268].

Head Start (HS) and Early Head Start (EHS), United States

Head Start started in 1965 to help break the cycle of poverty by providing preschool children in low income families with a programme that was able to meet their emotional, social, health, nutritional and psychological requirements. In 1995 EHS was introduced [308].

The Head Start and EHS programmes support the mental, social and emotional development of children from birth to age five. EHS is provided for pregnant women, infants and toddlers until the child is three years old. HS programmes are delivered to three and four year olds. HS agencies design services for children and families to meet the needs of the particular community in which they are located in. As a result a variety of service models are offered depending on the local needs. While some services are based in centres, home-based services are alternative options [309]. Services offered through HS include education, screening, social and emotional health, nutrition, health and safety, social services and transition services.

HS was formally evaluated by the National Head Start Impact study, which involved approximately 5,000 three and four year old children across 84 nationally representative agencies [310]. Children were randomly selected from classrooms and randomly assigned to HS or a control group for one year. After one year, HS children were found to have modest to moderate positive impacts on most of the outcome areas assessed including language, early pre-reading skills and health and parenting. However, most of the effects found at the end of the HS year had disappeared by the end of the first year at school.

The Early Head Start Research and Evaluation Project (EHSREP) enrolled 3,001 families in a randomised controlled trial in 17 of the first EHS sites funded. EHS children had significantly better social, emotional and cognitive development than the control group [310]. They were also more likely to be immunised. There were also positive outcomes for parents who were more supportive, less punitive and had better self-sufficiency outcomes related to training, education and employment. They were also able to provide more stimulating home environments and read more to their children. While the impacts persisted for two years after the children left EHS, by the fifth grade at school almost all impacts had disappeared except an overall trend effect on a composite of social-emotional functioning. The EHSREP also found that there were small but statistically significant impacts on the percentage of children who visited a doctor for treatment of illness, the percentage of children immunised and the likelihood of hospitalisation for accident or injury [311].

While the national evaluation of HS and EHS found that the impacts were only short term other literature suggests that longer term effects may exist [310]. Four studies have analysed long term outcomes from observational data. These studies have found that those who attended HS were more likely to graduate from high school, go to college, and have higher incomes. Effects on improved health outcomes and the incidence of incarceration have also been found.



Toronto First Duty, Canada

Toronto First Duty (TFD) was established in 2001 as a demonstration project with partnerships between the City of Toronto, the Toronto District School Board and other community agencies. The goal of the programme was to develop a universally accessible service that promoted the healthy development of children from conception to primary school [312]. In addition the ability of parents to work or study was facilitated and they were supported in their parenting roles. Elements of the TFD programme included integrated governance, seamless access, a staff team, an integrated early learning environment and parent participation.

Core service elements at each site included childcare, kindergarten and parenting support or family literacy programmes [313]. Other services also included public health, counselling, a library and other community resources. The schools were thus used as a 'hub' for service delivery. In this programme integration involved kindergarten teachers and early childhood professionals working together as a team with shared roles and responsibilities. There were integrated connections between the early childhood teams, parents and community agencies through direct communications.

There have been a number of evaluations of the TFD model, all using a mixed methods approach [314]. These have included literature reviews, policy document reviews, process records, key informant interviews, front line staff interviews and surveys, direct programme observations, parent focus groups and surveys, direct child measures, a community public awareness survey and community provider surveys.

These evaluations found that for successful implementation of early childhood school hubs organisational change and leadership were required [314]. Working in integrated teams meant that staff had to overcome professional barriers. Joint professional development, shared goals, specific aims for children and regular meetings helped this to occur. It also found that integration of child care, parenting and kindergarten programmes did not cost any more than traditional service delivery. Other key challenges faced included funding, staff and leadership turnover, and a lack of integration at higher levels of government. It was felt that while the TFD model could be implemented successfully, wide scale integration and improvement of early childhood services required policy change beyond individual sites and beyond the local level [315].

Parents reported high levels of satisfaction with TFD and the concept of integrated services [314]. They reported being consulted more about services and having better access to the range of programmes available. Parents also felt more empowered to talk to their children's kindergarten teacher and help their children learn from home [316]. The research also indicated that service integration was associated with lower levels of parenting hassles when navigating between child care and school, greater satisfaction with some forms of support and parents naming kindergarten teachers and early childhood educators as part of their social network.

There was no assessment of child outcomes built into the evaluation but kindergarten teacher rating of school readiness on the Early Development Instruments suggest that children benefited socially and developed pre-academic skills [316]. More intense use of TFD services predicted child development outcomes in certain domains including language and cognitive development, communication and general knowledge and physical health and wellbeing.

Summary of the effectiveness of integrated services

There are many examples of integrated services in New Zealand and overseas. There are also many challenges associated with assessing the effectiveness of these services [300]. These include a lack of clarity about the meaning of integrated working and the extent to which integration actually occurs. Many evaluations have also been subject to methodological limitations including the biases that arise when recruiting study subjects only from current service users, or from focusing solely on professional and user perceptions, without taking into account actual outcomes for children and their families.



Another pitfall is evaluating programmes before they have been up and running long enough for any valid assessment of their effectiveness to be made.

The evaluations of Sure Start (UK) and Head Start/Early Start (US) appear to be less subject to these of limitations than many local studies. However, these programmes still found mixed benefits for children and their families. This may be due to the time required to achieve and document such outcomes [300]. Integrated services are also only one of many influences that affect outcomes and therefore it can be difficult to make a causal link between integrated services and such outcomes.

Factors required for effective integrated services

While the literature suggests there is no one model that is effective in all situations, there are a number of factors that have been identified worldwide that may increase the likelihood of a programme's success [317]. These factors have been identified in a number of evaluations, literature reviews and via expert opinion.

Leadership

Leadership is considered a significant factor in the development of integrated services [261]. Bringing together multiple service providers and agencies requires committed and visible leadership [256]. It is important that leaders can communicate the importance of the collaboration to the agencies involved. In addition they must enable agencies to find common ground so they can bring together their different working practices and expectations [258,300].

Leaders also play an important role in promoting the visions and aims of integrated services. They are integral to inspiring and supporting staff through the process of change [258]. Leaders are also thought to have influence through providing resources, setting deadlines and identifying projects [318]. In addition they can establish the climate of the integrated service, manage the context of the service and provide a structure to support its efforts.

Several qualities have been identified that that may be important in leaders of integrated teams. These include motivation and the ability to motivate others, creativity, passion, charisma, social skills, technical expertise, a commitment to learn and a capacity to draw others in [261,318,319]. Leaders should also have high levels of credibility, influence and integrity that is acknowledged by both internal and external organisations [261]. They need to understand the dynamics occurring within the system in order to develop an environment that facilitates integrated working [318].

Shared vision and goals

A clearly defined vision needs to be identified and agreed on by all stakeholders [258]. This should include a common understanding of the problem and a joint approach to solving it [320]. The language used by different sectors can act as a barrier to determining a common vision. Therefore, it is important that an understanding and agreement of terminology is developed early in the process. Supporting common values can result in individuals creating a collaborative culture which will increase the effectiveness of integrated working [319]. A key challenge can be the lack of clarity in the definition of integrated services [300].

Goals also provide a direction for action and motivation, and can be a base for measuring effectiveness [261]. However, organisational cultures and procedures can make goal setting complex. Differences in goals between organisations can result in the loss of partnership direction and commitment. It is therefore necessary to ensure that all of the organisations involved are committed to the goals. It may be necessary for different goals to be set at different levels of the service (e.g. for managers and front line staff), to ensure that they are relevant for all staff involved.



Governance

Governance structures should facilitate the co-ordination of inter-professional teams [256]. Therefore, governance structures themselves should be representative of all stakeholders that understand the delivery of care. It is also important that service users are included as stakeholders [258]. Responsibilities should be clearly defined as this will enable a sense of joint ownership and responsibility for performance and outcomes [286].

Community engagement

Integrated services need to be based on the needs and priorities of the families and communities using the services [258]. Understanding users' experiences and expectations is crucial when developing a responsive service [261].

Integrated services should also aim to empower families and communities, build on the communities' existing strengths and enable families to develop further skills. The programmes must be sensitive and responsive to cultural, ethnic and socioeconomic diversity. Engagement of the community is important as it creates opportunities for families to participate in the integrated service without perceiving it to be threatening.

Inter-professional practice

In order for integrated services to be effective, strong inter-professional relationships need to be built. These relationships should be based on trust, mutual respect and understanding [319]. Trust is particularly important for integrated working and results in the most enduring relationships. Mistrust can be overcome through the setting of parameters to promote fairness and accountability of behaviour. Shared vision and goals can facilitate strong relationships. A history of positive informal networking can be a positive influence to inter-professional relationships whereas a history of difficulties and conflict can be inhibitive [261].

The clarity of the role of a professional or an agency is an enabler of integrated services [321]. If role boundaries are clear and there is understanding of the other agencies' boundaries it can lead to effective integration. Confusion over other professionals' or agencies' roles can occur when their respective responsibilities are not understood. This may partly occur due to differences in the language used to define users' problems and the interventions they require. This can result in professionals working in silos where they feel comfortable in their own area, but where the needs of children and families are neglected as they fall out of the individual professional's brief [321]. This may be a particular issue for those that are near the threshold for intervention. In addition blurred professional responsibilities can have numerous effects on staff including feelings of inequity, stress, anxiety and negative effects on job satisfaction.

Brown and White [257] found that cultural differences between professions was also a barrier. These could include differences in language, attitudes to information sharing and professional principles. A lack of shared understanding about the purpose of a partnership, meetings or plans could also cause difficulties in integrated services. The development of a stakeholder culture where professionals were given the freedom to be creative and innovative around service design while being given clear parameters could also lead to effective integrated services. An informal arena for developing relationships can also facilitate trust between professionals. People may be more flexible when they are able to get to know each other on a personal basis. Having the same working/office environment can provide opportunities for professionals to get to know each other personally, have an insight into other professional roles, have easy access to a range of professional knowledge and skills, work more collaboratively and develop a quality, resilient and flexible service.

For an integrated programme or service to be effective staff need to be supported in ongoing training to promote high quality, effective services [258]. Training needs may include communication and counselling skills, family-centred practice, cross-cultural competence, interdisciplinary teamwork, interagency collaboration, inclusive practices and the use of natural learning environments. Ongoing training in interprofessional practice as



well as mentoring and supervision is especially important [322]. Informal learning is thought to be just as important as formal training. Sloper [270] also suggest that learning in groups of professions can be effective in decreasing inter-professional stereotypes. Quality improvement programmes and interagency training may also facilitate understanding different professional roles. It can also allow the development of common language and increased knowledge of skills required to work together [261].

Common measures of accountability

A shared measurement system is considered to be essential to achieve collective impact [320]. Collecting data consistently across all organisations not only enables organisations to hold each other accountable but also ensures that partners can learn from each other's successes and failures, as well as ensuring that effort is being focused in the most appropriate areas. The collection of data also supports evaluation, reviews of the service, informed decision making, identifying where additional resources are needed and identifying new approaches to tackling problems [318].

Funding

One of the anticipated benefits of integration is that it will decrease costs, due to the reduction of duplicated data collection, more efficient processes of assessment and communication and better systems of planning and delivering services [321]. However, many have found that integrated services may result in increased costs prior to producing savings [256] due to the increased resources required to facilitate collaboration.

Existing funding arrangements are also often identified as barriers to integration [263]. Siloed funding can prevent agencies from sharing resources and incentivise working individually.

Different mechanisms can be utilised for funding new models of working [263]. Payment for performance funding models (rewarding providers for improved user outcomes) have been used for co-ordinated interventions addressing social issues. Personal budgets have been used to enable users and case managers to bypass organisation silos and purchase supports from the providers. Pooled budgets may be used to co-ordinate services for local needs. Joint commissioning may enable agencies to overcome barriers to share resources and co-ordinate investment. Collaboration can also be incentivised through contracting and tendering reforms.

Information systems and data sharing

Quality information systems will enhance the ability of agencies to communicate with each other and enable the flow of information across pathways [256]. The sharing of information is essential for early intervention and the provision of effective and efficient services [300]. It is also important that professionals understand when, why and how to share information. Data sharing between agencies can also be problematic. This can result from mistrust between service providers or due to legislative barriers [263].

Electronic health records have been identified as a mechanism to link consumers and providers across the care continuum and provide information to all stakeholders [263]. However, developing and implementing electronic systems has been found to be time consuming, complex and costly.

Steps required for effective implementation

International and local frameworks

A number of different steps have been identified that will lead to successful integrated services. Many of these steps aim to decrease the barriers to integrated service delivery and increase the facilitators. In New Zealand, the Integrated Service Delivery: Regional Co-ordination workstream formed following *The Report of the Advisory Group on the Review of the Centre* found that the key steps to implementing successful integration were getting buy-in from other agencies and staff, planning carefully and thoroughly, supporting



locally led initiatives, adapting centrally led initiatives, investing in relationship building and building on and linking to existing initiatives and resources [262].

In Victoria, Australia, a framework has been developed to support the establishment and operation of children's centres [323]. This framework provides a step by step approach to developing integrated services. The steps include developing a shared vision, identifying desired outcomes, identifying the services to be delivered, addressing practical issues, finalising governance arrangements and drafting an action plan.

Following a global survey to review integration initiatives across 22 jurisdictions KMPG also offer steps to successful integration [263]. The first step is planning to ensure that the population and their needs are understood. Secondly leadership and buy-in with cross sectoral support is essential. The third step is ensuring there is organisational capacity, including effective IT infrastructure, funding arrangements, data sharing practices, and an agile workforce. Finally ongoing evaluation is required with feedback mechanisms so that adjustments can be made and outcomes understood.

In the US key steps have also been identified to integrate services [324]. The first is assessing the extent to which the current service is integrated. This may include assessing the vision and leadership, the organisational model, the workforce, the infrastructure, and practices and processes. Second it important to determine where funding is currently being spent, on what, on whom and how to realign this. Third there needs to be a commitment to understand the challenges that users face as well as communicating the vision to reform services. Fourthly assessing performance metrics and management activities that reflect the integrated services rather than a silo mentality and finally learning and sharing experiences with others also involved in integrating services will increase the knowledge in this area.

When considering how integrated services in New Zealand might be developed, a framework developed by Chatterji which considers how best to address complex public health problems is relevant [228]. This framework suggests that decision makers need to address why an integrated service is needed, what specific actions should be taken, and how these actions can be implemented or scaled up. The evidence to answer these questions can come from quantitative sources (experimental, quasi-experimental or observational), or qualitative or mixed methods approaches. Evidence from different disciplines, expert knowledge or guidelines may also be useful.

Effectively evaluating new services

As described earlier, the majority of integrated services in New Zealand are either relatively new, or their evaluations have been limited in scope. In the absence of a higher quality evidence base, any new integrated services need to be implemented taking into account the "factors required for effective integrated services" outlined above. Given that such evaluations are complex, a framework for evaluating the services' effectiveness needs to be determined when the new service is being planned.

Bardsley et al. have evaluated over 30 different interventions involving integrated services and suggest the following when planning such an evaluation [325].

1. **Planning and implementing large scale changes takes time, as does the development of the evaluation.** Therefore any results from the intervention will not occur quickly and one year of operation will not show much result beyond the process of implementation. This will also be the case for pilot schemes which often have a large pressure to deliver outcomes quickly. Funders need to be aware of these restrictions and the fact that in the first one or two years, a process evaluation with changes in structure may be all that can be demonstrated.
2. **Clearly define the intervention and what is trying to be achieved.** This will allow proper assessment in the evaluation. The intervention should be implemented well with clear measures for the evaluation. Any changes that are made need to be made through clear logic.



3. **Be explicit about how desired outcomes arise**, i.e. the process by which the intervention will have an impact. It is also helpful to understand what the drivers of that process will be. Interim markers of success can also be beneficial to assess shorter term effects prior to being able to assess any longer term benefits.
4. **The size and duration of the evaluation will affect whether the intervention demonstrates a statistically significant change.** The evaluation will require a substantial number of users to have experienced the service. However, if the evaluation is hurried with loosening of eligibility criteria then the effectiveness of the evaluation may be reduced.
5. **Carry out a process evaluation.** The impact an intervention has will be dependent on its implementation. Factors affecting the strength of the implementation include barriers to implementation not being understood, the intervention being poorly defined, poor implementation and project management and a change in the wider context. A process evaluation may then be able to explain why the intervention is not producing the intended outcomes.
6. **Consider the best model for the evaluation.** For all complex interventions there should be a period with only light monitoring and assessment of the process of implementation. This will allow the intervention time to establish itself. Formative evaluations are also thought to be useful in helping pilot programmes to evolve appropriately and give ongoing feedback.

In addition to these suggestions, Goodwin [326] also suggest that it is important to carry out a baseline assessment on any measure to be assessed. This is needed to demonstrate an improvement in care. In some evaluations matched populations have been used to assess whether users accessing integrated care can achieve better outcomes than those whose care is not integrated.

Performance and outcome measures for integrated services

Outcome measures in integrated services can include care outcome measures, care process measures and measures of care-co-ordination and family reported perceptions [326]. Alternatively others have suggested that performance indicators can be used to assess whether a service is achieving its aims. Nine categories of performance indicators have been suggested by Hassett and Austin 1997 [269]. These include:

- Responsiveness to programme constituencies
- Responsiveness to local political preferences
- Responsiveness to local need
- Equity in service provision and resource distribution
- Client accessibility to multiple programmes
- Co-ordination and integration
- Accountability
- Maximising of efficiency
- Intra and inter departmental co-ordination.

Every Child Matters (UK) developed an outcomes framework with national indicators for each of the strategic objectives [327]. The indicators included both quality of life indicators such as prevalence of breastfeeding, percentage of children who have experienced bullying and inequality gaps in the achievement of a Level 3 qualification by the age of 19 years, as well as quality of services measures such as the effectiveness of child and adolescent mental health services, percentage of initial assessments for children's social care carried out within seven days and percentage of schools providing access to extended services.

It is important that all integrated services are evaluated for their effectiveness to ensure that outcomes for children and their families are improving. Evaluating integrated services can be a challenge and requires assessment of many different aspects of the services. While information on user and professional perceptions of the service are commonly



gathered, it is only by gathering information on child and family outcomes that the effectiveness of integrated services can truly be understood. These outcomes can take time to emerge and therefore it is important that the evaluation performed is appropriate to the stage of implementation of the programme.

Conclusions

Worldwide there is an increasing focus on delivering integrated services to children and their families. Through taking a child and family-centred approach with organisations working together at an operational level, it is anticipated that integration will be beneficial from both the provider and user perspective.

There are many examples of integrated services in both New Zealand and internationally. While integrated services have the potential to improve outcomes from both a provider and user perspective there are limitations in the evaluations of these services. These include a focus on user and provider perceptions rather than outcome measures for children and their families. In addition there may be biases in those recruited to take part in the evaluations. Further work in this area is required.

There are many different types of integrated services with no one model being suitable for every scenario. It is therefore important that each integrated service is developed giving consideration to the local context. Key factors for achieving effective integrated services have been described. These include leadership, shared vision and aims, governance, community engagement, inter-professional practice, funding and information systems. A number of these have the potential to challenge many DHBs. Leadership is a critical factor in the success of integrated services and leadership from DHBs will be important in being able to drive integrated services forward and promoting intersectoral collaboration. Funding is also integral to the delivery of integrated services as if it is not addressed, it has the potential to lead to perverse incentives and can encourage organisations to work in silos. Additionally increased funding is often required when integrated services are initiated due to the resources required for collaboration. It is vital that DHBs are able to address the issue of funding for integrated services if they are to succeed.

All integrated services should be appropriately evaluated depending on the stage of the initiative. In the early stages this may involve a process evaluation with identification of how collaboration is progressing. As usual methods of evaluation struggle to identify improved user outcomes as a result of integrated services it will be harder to demonstrate these. Importantly, outcome measures should not be assessed in too early in the programme's development as outcomes can take time to emerge and may result in an unfavourable appraisal of the programme. DHBs should therefore be prepared to support integrated services for longer durations of time, without evidence on outcomes necessarily being available.

Integrated service delivery has the potential to improve outcomes for children and their families. However, the process of developing and delivering an integrated service can be complex with many challenges. It is therefore critical that DHBs are prepared to support all aspects of an integrated service for it to succeed.



ORAL HEALTH



ORAL HEALTH

Introduction

In New Zealand, District Health Boards fund and provide free dental care for children and adolescents. Pre-school and primary school aged children receive care at Community Oral Health Clinics, many of which are located at schools. There are also mobile clinics which often serve remote and rural areas. There has been consolidation of services in many areas so it is no longer the case that most primary schools have a dental clinic. Young people up to the age of 18 can receive free care from private dentists contracted by the DHB [328].

The Ministry of Health's Early Childhood Oral Health Toolkit [329] notes that, in 2005, 48% of all children had experienced dental caries at five years of age. The toolkit also notes that there are significant inequalities in children's oral health, especially between Māori and non-Māori. Recognising that the risk of dental decay begins as soon as the teeth begin to appear in the mouth (at around six months of age) and that some children experience significant dental caries before the traditional age of enrolment with Child Oral Health Services at 2½ years of age, the toolkit recommends that Well Child/Tamariki Ora and other non-oral health providers undertake a "Lift the Lip" caries risk assessment in all children at between nine and 12 months of age, ensure that all children are enrolled with a dental service by 12 months of age and ensure that the information from the caries risk assessment is sent to the local DHB child oral health services provider. High risk children should have contact with an oral health provider at 12 months of age and all children should have contact by 2½ years of age.

The following section reviews the oral health status of children and young people using information from two separate sources. The first is community Oral Health Service data, which provides information on the proportion of children who were caries-free at 5 years, and the number who had decayed, missing, or filled teeth (DMFT) at 12 years. A separate sub-section considers the proportion of eligible young people accessing publicly funded dental services. The second data source is the National Minimum Dataset, which provides information on hospital admissions for dental caries in children and young people.

COMMUNITY ORAL HEALTH SERVICES

Data Sources and Methods

Indicators

1. *Proportion of children who were caries-free at age 5 years*

Numerator: Number of children aged 5 years whose deciduous teeth were caries-free on completion of treatment with an oral health service.

Denominator: Total number of 5 year olds who were examined in the year

2. *Mean number of decayed, missing or filled teeth (DMFT) at age 12 years*

Numerator: Number of permanent teeth of children aged around 12 years that are decayed, missing (due to caries) or filled on completion of treatment in Year 8, prior to leaving the oral health service

Denominator: Total number of Year 8 children who were examined in the year

3. *Proportion of adolescents using publicly funded dental services*

Numerator: Total number of adolescents (13–18 years) using publicly funded dental services

Denominator: Total number of eligible adolescents (13–18 years)

Notes on Interpretation

Note 1: The data in this section was obtained from <http://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/oral-health-data-and-stats>. The Ministry of Health collates this information from the oral health services. From 2010, information was provided by community oral health services, which replaced school dental services. Once children are enrolled with an oral health service they are seen, assessed and have appropriate treatment prescribed. Upon completion of treatment, dental health status data are collected on 5 year-olds and children in Year 8 (aged approximately 12 years).



Note 2: In this section, fluoridation status refers to the water supply of the service which the student attended, rather than the fluoridation status of the area in which they resided.

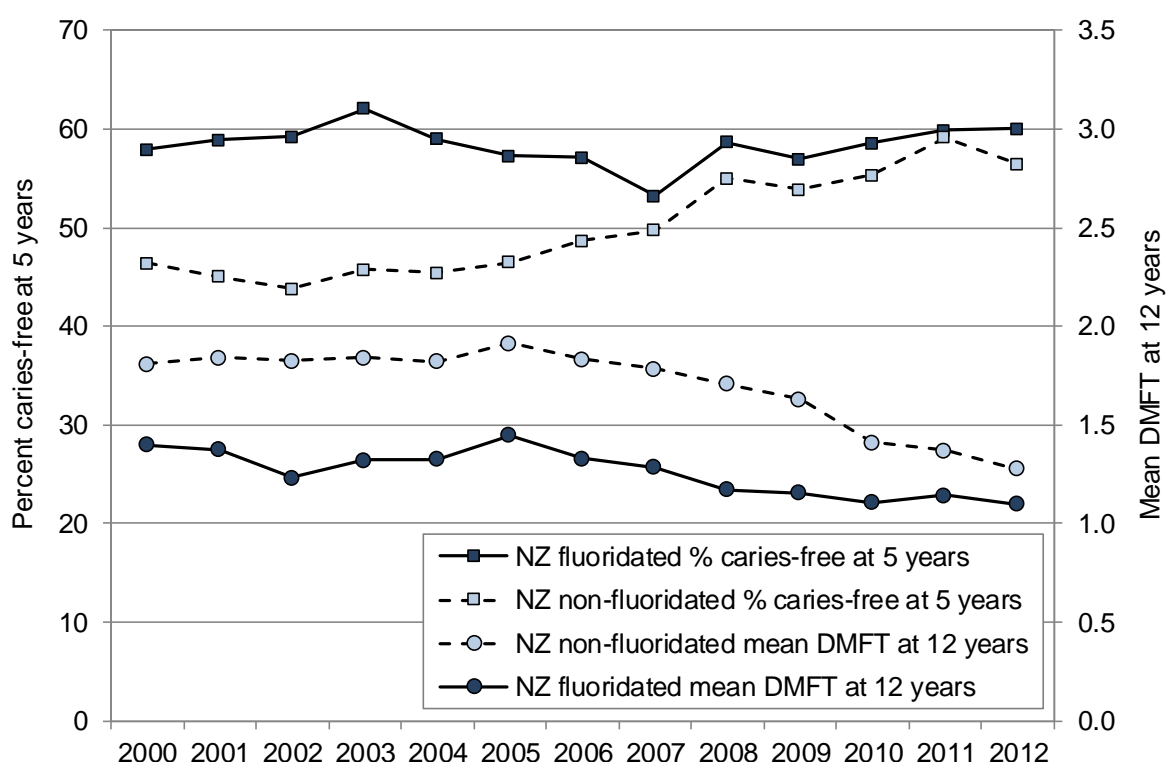
Note 3: Tests of statistical significance have not been applied to the data in this section, and thus any associations described do not imply statistical significance or non-significance.

New Zealand Distribution and Trends

New Zealand Trends

In New Zealand from 2000 to 2012, the percentage of children who were caries-free at age 5 years was consistently higher in areas with fluoridated water supplies. Children aged 12 years in areas with non-fluoridated water supplies had higher mean scores for the number of decayed, missing or filled teeth (DMFT) than the mean DMFT scores for children in areas with fluoridated water supplies (**Figure 128**).

Figure 128. Percentage of children who were caries-free at age 5 years and mean scores for the number of decayed, missing or filled permanent teeth (DMFT) at age 12 years, New Zealand 2000–2012



Source: Ministry of Health

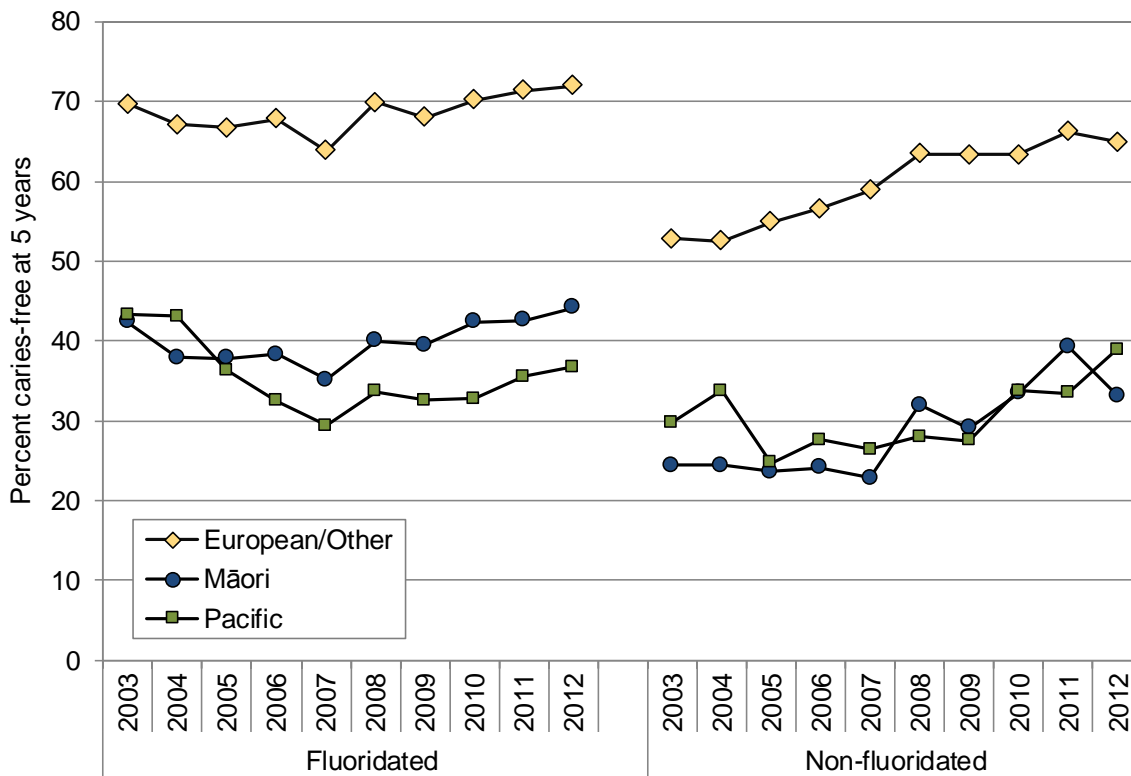
New Zealand Distribution by Ethnicity

In New Zealand from 2003 to 2012, a higher proportion of European/Other children, compared with Māori or Pacific children were caries-free at age 5 years. For European/Other and Māori children, the proportion that were caries-free was higher in areas with fluoridated water supplies from 2003 to 2012, while for Pacific children the proportion was higher from 2003 to 2009 (**Figure 129**).

In New Zealand from 2003 to 2012, mean DMFT scores at age 12 years were higher for Māori and Pacific children compared with European/Other children. For each ethnic group, mean DMFT scores were higher for children in areas with non-fluoridated water supplies (**Figure 130**).

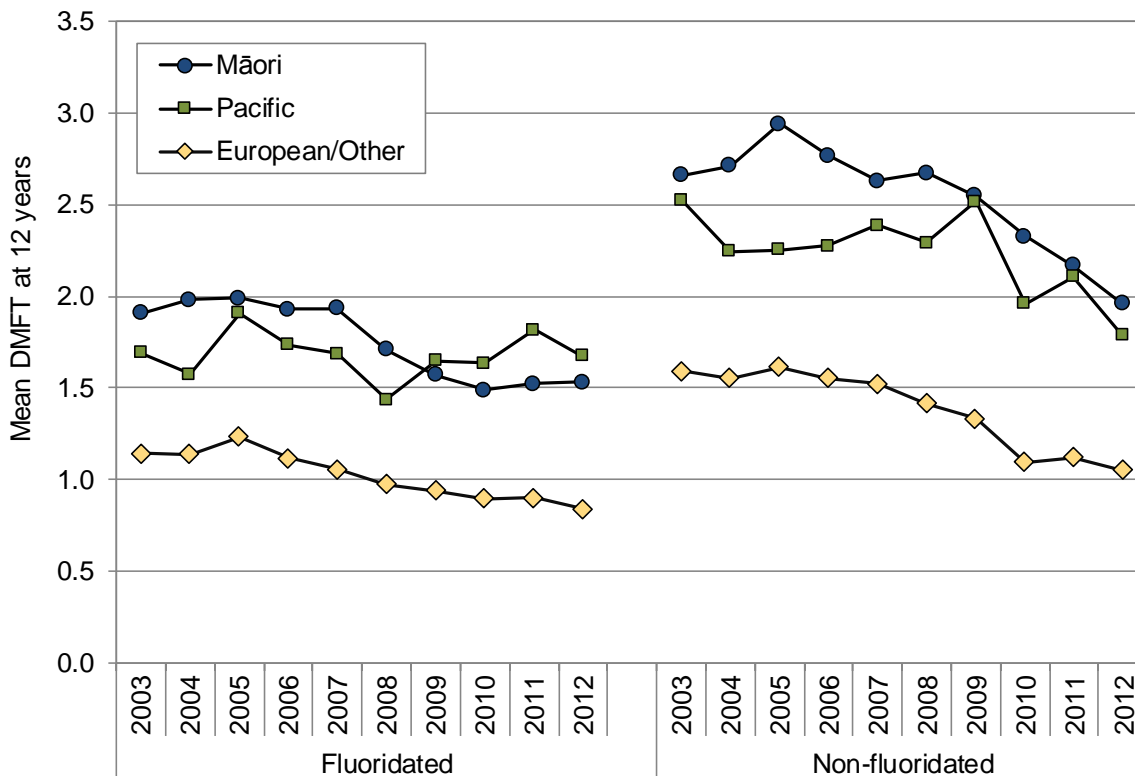


Figure 129. Percentage of children who were caries-free at age 5 years by ethnicity, New Zealand 2003–2012



Source: Ministry of Health

Figure 130. Mean scores for the number of decayed, missing or filled permanent teeth (DMFT) at age 12 years by ethnicity, New Zealand 2003–2012



Source: Ministry of Health



Northern DHBs Distribution and Trends

In Northland during 2012, none of the 5 year olds examined by the oral health service had access to fluoridated water, compared with 90.3% in Waitemata, 93.9% in Auckland DHB, and 92.0% in Counties Manukau. This proportion is based on the fluoridation status of the services' water supply, rather than the residential area in which the children live.

Northern DHB Trends

Proportion caries-free at age 5 years

In Northland during 2000–2012, the proportion of children who were caries-free at age 5 years was lower than the New Zealand non-fluoridated rate. However, in the Waitemata DHB the proportion of children caries-free at age 5 years was higher than the New Zealand rate in both fluoridated and non-fluoridated areas. While rates in Auckland DHB were higher than the New Zealand rate in fluoridated areas, differences were less consistent in non-fluoridated areas. In Counties Manukau, the proportion of children caries free at 5 years was lower than the New Zealand rate in fluoridated areas from 2005 onwards, while rates were more similar to the New Zealand rate in non-fluoridated areas during 2009–2012 (**Figure 131**).

Mean DMFT at age 12 years

In Northland during 2000–2012, mean DMFT scores at age 12 years were generally higher than the New Zealand rate for non-fluoridated areas, while in the Waitemata and Auckland DHBs rates were lower than the New Zealand rate in both fluoridated and non-fluoridated areas for the majority of this period. In Counties Manukau, mean DMFT scores were lower than the New Zealand rate in non-fluoridated areas, but similar to/higher than the New Zealand rate in fluoridated areas (**Figure 132**).

Distribution by Ethnicity

Proportion caries-free at age 5 years

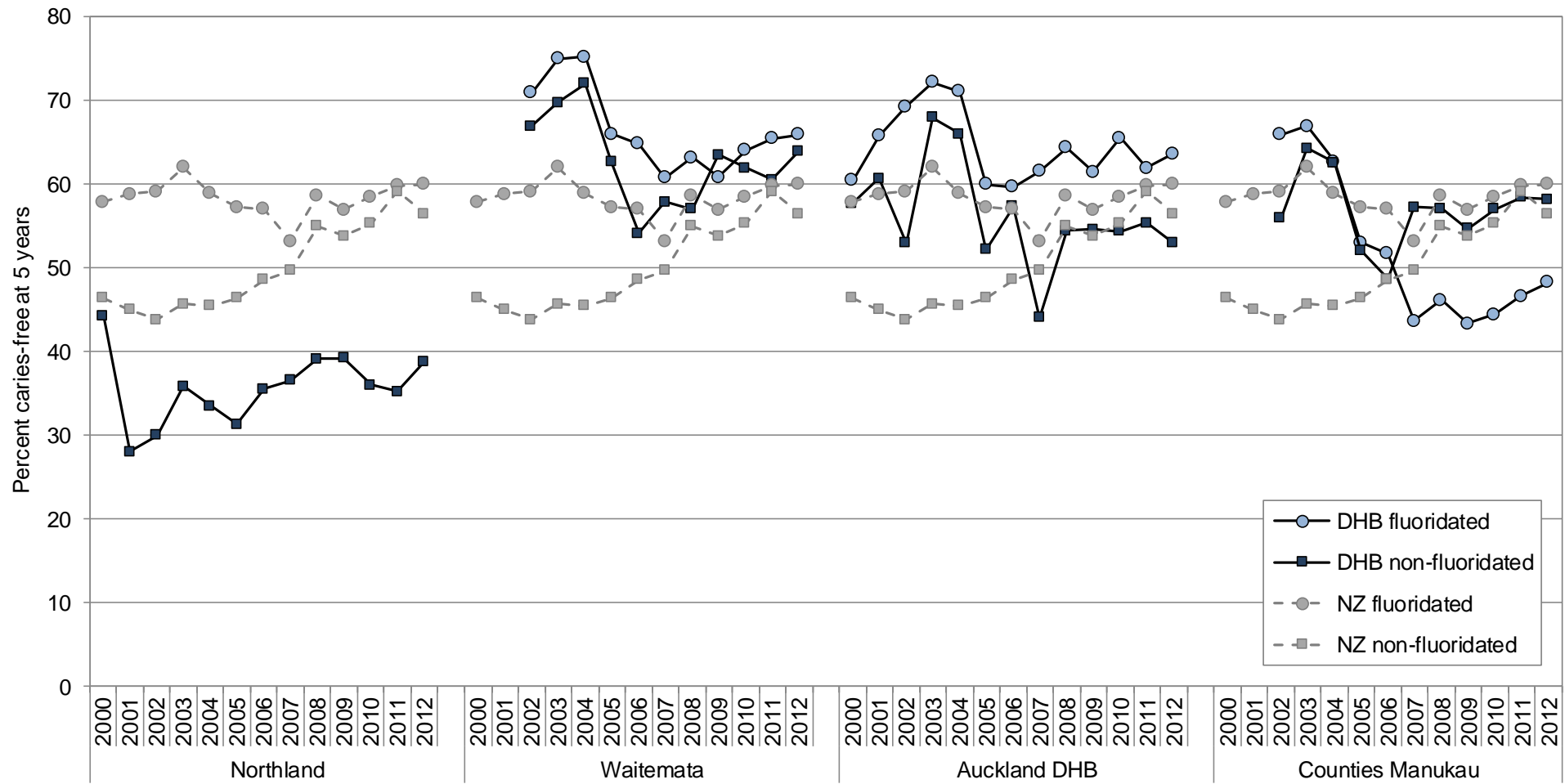
In the Waitemata, Auckland and Counties Manukau DHBs from during 2003–2012, a higher proportion of European/Other children, than Māori or Pacific children, were caries-free at age 5 years in both fluoridated and non-fluoridated areas. Similarly in Northland, a higher proportion of European/Other children than Māori children were caries-free at age 5 years (**Figure 133**).

Mean DMFT at age 12 years

In the Waitemata, Auckland and Counties Manukau DHBs during 2003–2012, mean DMFT scores at age 12 years were higher for Māori and Pacific children, than for European/Other children in fluoridated areas. In the Waitemata and Auckland DHBs ethnic differences were less consistent in non-fluoridated areas (possibly as a result of small numbers). Similarly in Northland mean DMFT scores at age 12 years were higher for Māori children than for European/Other children (**Figure 134**).

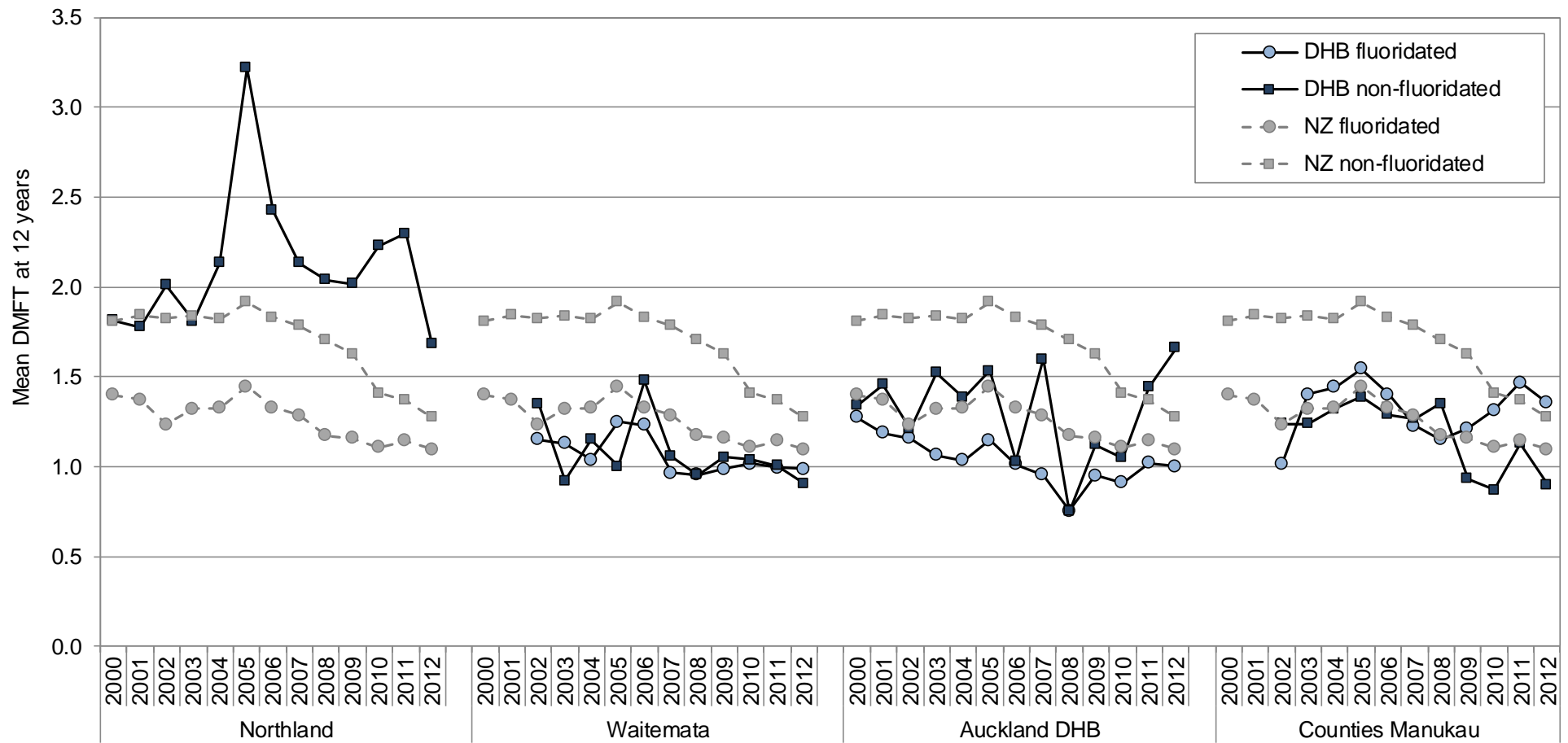


Figure 131. Percentage of children who were caries-free at age 5 years, Northern DHBs vs. New Zealand 2000–2012



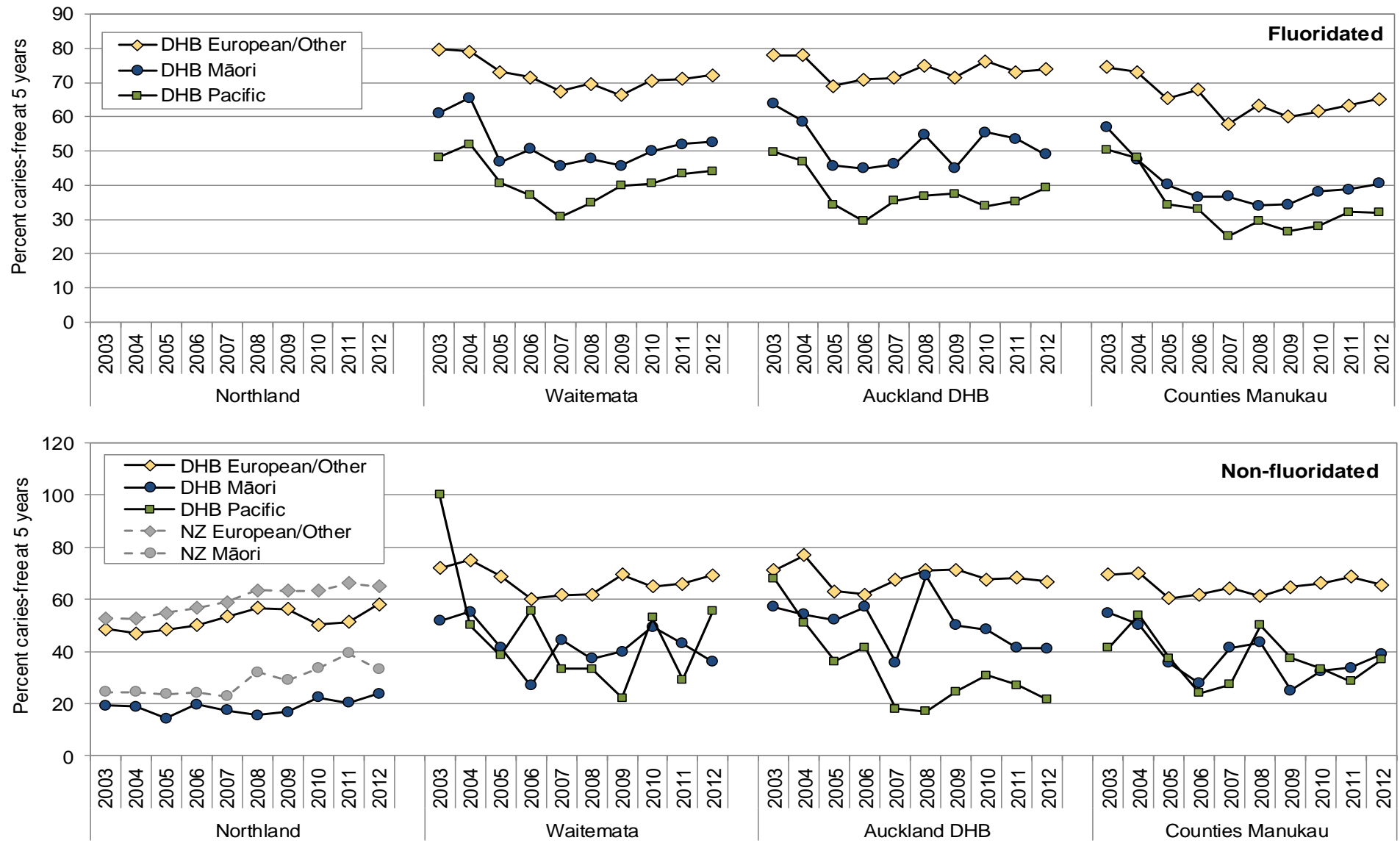
Source: Ministry of Health

Figure 132. Mean scores for the number of decayed, missing or filled permanent teeth (DMFT) at age 12 years, Northern DHBs vs. New Zealand 2000–2012



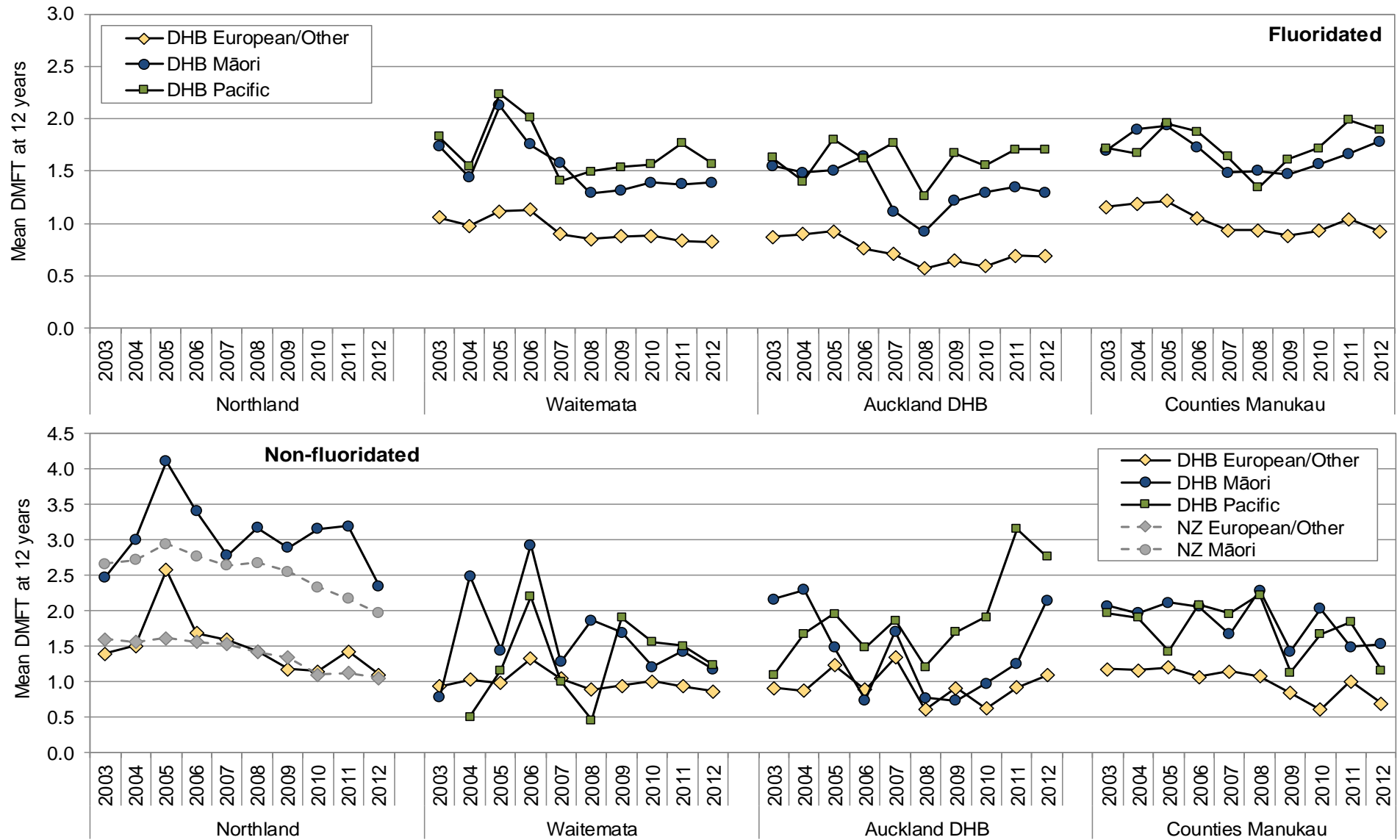
Source: Ministry of Health

Figure 133. Percentage of children who were caries-free at age 5 years by ethnicity, Northern DHBs 2003–2012



Source: Ministry of Health

Figure 134. Mean scores for the number of decayed, missing or filled permanent teeth (DMFT) at age 12 years by ethnicity, Northern DHBs 2003–2012

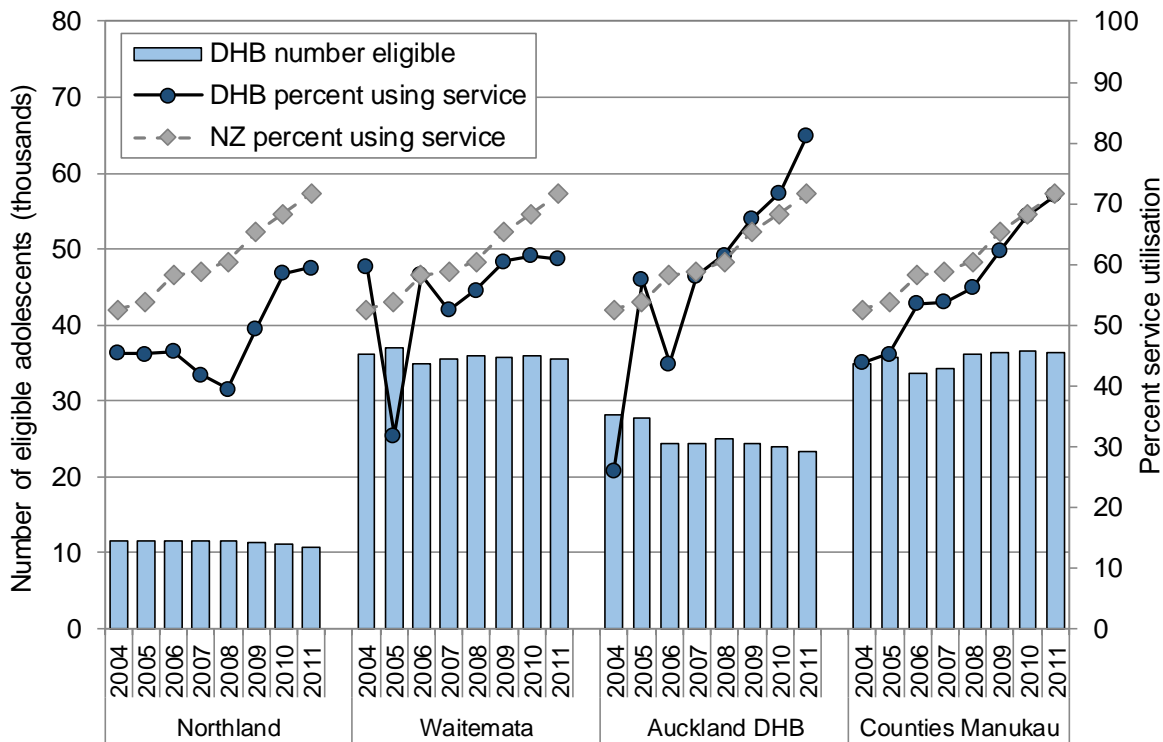


Source: Ministry of Health

Proportion of adolescents using publicly funded dental services

During 2011, 59.4% of Northland, 60.9% of Waitemata, 81.2% of Auckland and 71.4% of Counties Manukau adolescents who were eligible (aged ≈13–18 years) were reported as accessing publicly funded dental services. The proportion of eligible adolescents accessing services increased during 2004–2011 in Northland, Auckland and Counties Manukau, but was more static in the Waitemata DHB (Figure 135). No information however, was available for these young people on the frequency or type of service accessed.

Figure 135. Number of adolescents using publicly funded dental services, Northern DHBs vs. New Zealand 2004–2011



Source: Ministry of Health



HOSPITAL ADMISSIONS FOR DENTAL CARIES

Data Sources and Methods

Indicators

1. Hospital admissions for dental caries in children and young people aged 0–24 years

Numerator: National Minimum Dataset (NMDS): Hospital admissions (acute, semi acute and waiting list) for children and young people aged 0–24 years with a primary ICD-10-AM diagnosis of dental caries (K02). Other dental conditions assessed in some tables include: Disorders of tooth development/eruption (K00), Embedded/impacted teeth (K01), Other diseases of the teeth hard tissue (K03), Diseases of the pulp/periapical tissue (K04), Gingivitis/Periodontal diseases (K05), Other disorders of the gingiva/edentulous alveolar ridge (K06), Dentofacial anomalies/malocclusion (K07), Other disorders of the teeth or supporting structures (K08).

Denominator: Statistics NZ estimated resident population (with linear extrapolation to calculate denominators between Census years).

Notes on Interpretation

Note 1: An acute admission is an unplanned admission occurring on the day of presentation, while a semi-acute admission (referred to in NMDS as an arranged admission) is a non-acute admission with the admit date being <7 days after the date the decision was made that the admission was necessary. A waiting list admission is a planned admission, where the admission date is 7+ days after the date the decision was made that the admission was necessary. In New Zealand, most DHBs admit children and young people with dental caries/other oral health problems, either from the waiting list, or on a semi-acute basis (as an arranged admission).

Note 2: **Appendix 3** outlines the limitations of the hospital admission data used. The reader is urged to review this appendix before interpreting any trends based on hospital admission data.

Note 3: 95% confidence intervals have been provided for the rate ratios in this section and where appropriate, the terms significant or not significant have been used to communicate the significance of the observed associations. Tests of statistical significance have not been applied to other data in this section, so unless the terms 'significant' or 'non-significant' are specifically used the associations described do not imply statistical significance or non-significance (see **Appendix 2** for further discussion of this issue).

New Zealand Distribution and Trends

New Zealand Trends

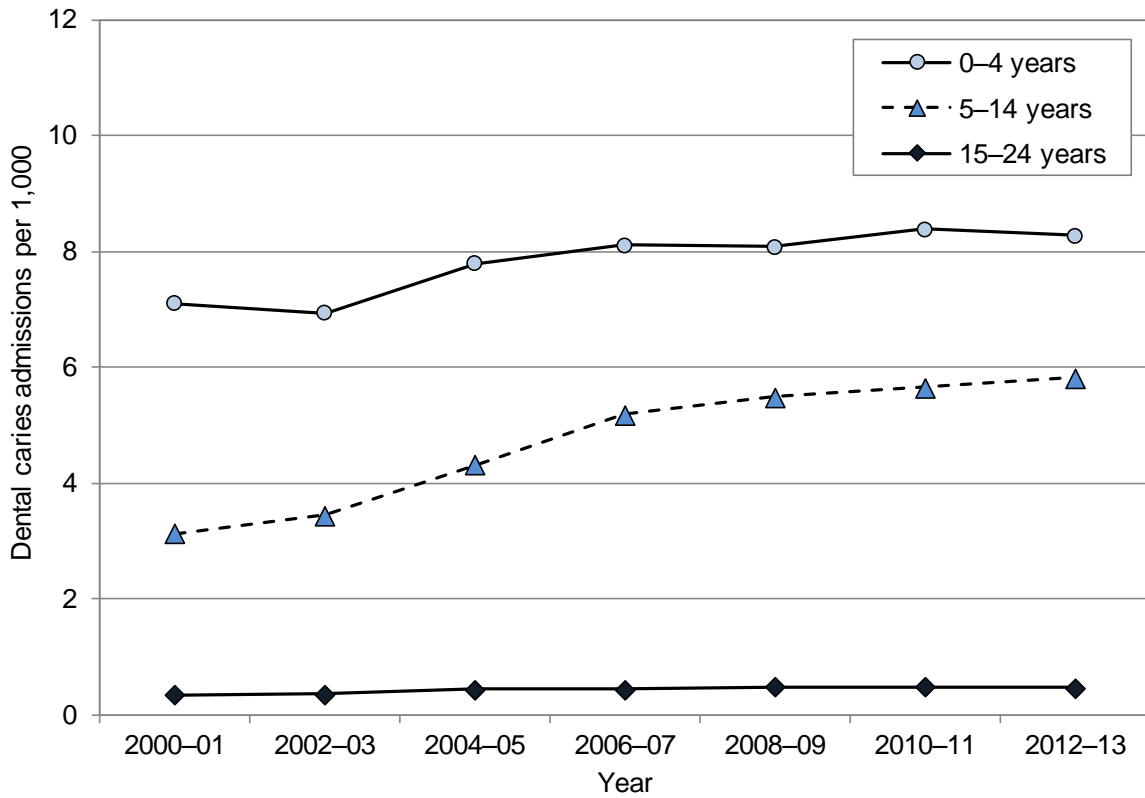
In New Zealand during 2000–2013, hospital admission rates for dental caries were higher for children aged 0–4 years, and aged 5–14 years compared to rates for young people aged 15–24 years. While admissions increased for all three age groups during 2000–2013, in absolute terms, increases were greatest for those aged 5–14 and 0–4 years (**Figure 136**).

New Zealand Distribution by Age

In New Zealand during 2009–2013, hospital admissions for dental caries were infrequent in infants <1 year, but rose rapidly thereafter, to reach a peak at 4 years of age. Rates then decreased, with admissions being relatively infrequent after 14 years of age (**Figure 137**).

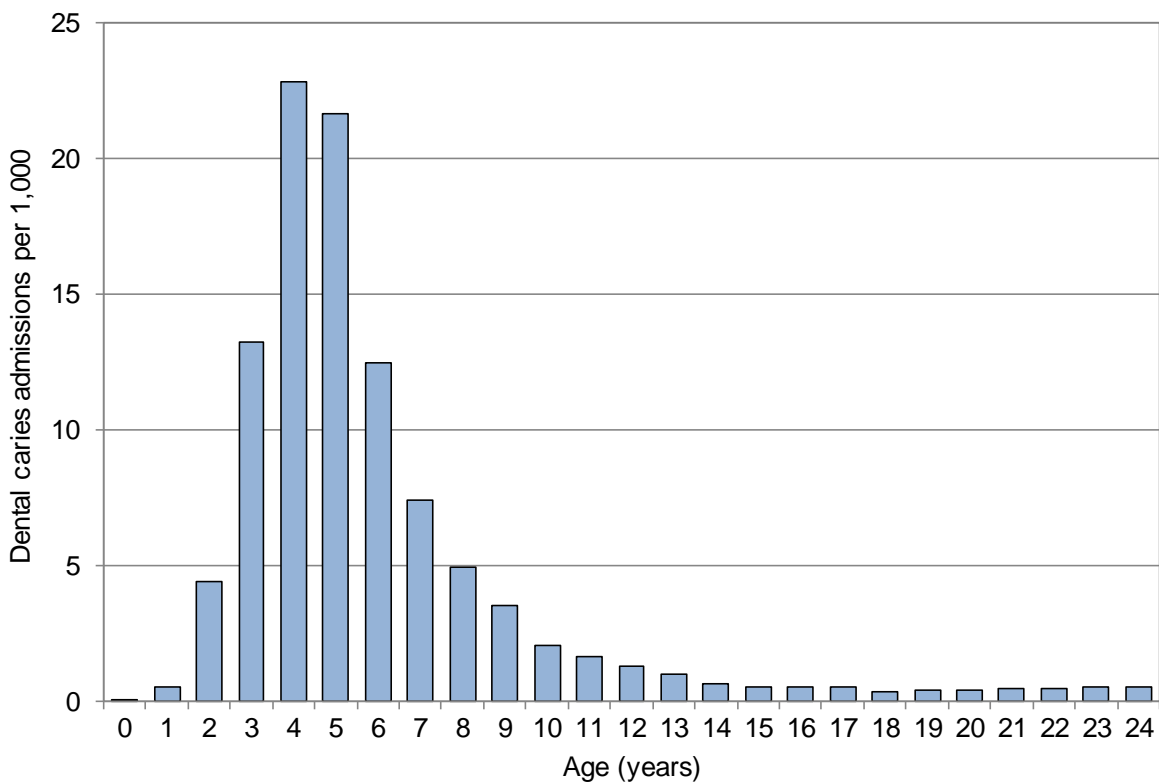


Figure 136. Hospital admissions for dental caries in children and young people aged 0–24 years, New Zealand 2000–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population

Figure 137. Hospital admissions for dental caries in children and young people by age, New Zealand 2009–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population



New Zealand Distribution by Primary Diagnosis

In New Zealand during 2009–2013, dental caries, followed by diseases of the pulp and periapical tissue, were the leading reasons for a dental admission in children aged 0–4 and aged 5–14 years. In contrast, embedded/impacted teeth, followed by dental caries were the leading reasons for an admission in young people aged 15–24 years (**Table 35**).

Table 35. Hospital admissions for dental conditions in children and young people aged 0–24 years by primary diagnosis, New Zealand 2009–2013

Primary diagnosis	Number: total 2009–2013	Number: annual average	Rate per 1,000	Percent
New Zealand				
0–4 years				
Dental caries	12,600	2,520.0	8.28	86.6
Diseases of the pulp/periapical tissue	1,517	303.4	1.00	10.4
Disorders of tooth development/eruption	185	37.0	0.12	1.3
Other disorders of the teeth/supporting structures	89	17.8	0.06	0.6
Gingivitis/periodontal diseases	60	12.0	0.04	0.4
Dentofacial anomalies/malocclusion	42	8.4	0.03	0.3
Other diseases of the teeth hard tissue	25	5.0	0.02	0.2
Other disorders of the gingiva/edentulous alveolar ridge	21	4.2	0.01	0.1
Embedded/impacted teeth	13	2.6	0.01	0.1
Total 0–4 years	14,552	2,910.4	9.56	100.0
5–14 years				
Dental caries	17,166	3,433.2	5.74	76.7
Diseases of the pulp/periapical tissue	2,241	448.2	0.75	10.0
Disorders of tooth development/eruption	1,283	256.6	0.43	5.7
Embedded/impacted teeth	774	154.8	0.26	3.5
Dentofacial anomalies/malocclusion	384	76.8	0.13	1.7
Other disorders of the teeth/supporting structures	235	47.0	0.08	1.1
Other diseases of the teeth hard tissue	196	39.2	0.07	0.9
Gingivitis/periodontal diseases	68	13.6	0.02	0.3
Other disorders of the gingiva/edentulous alveolar ridge	23	4.6	0.01	0.1
Total 5–14 years	22,370	4,474.0	7.48	100.0
15–24 years				
Embedded/impacted teeth	2,677	535.4	0.86	42.2
Dental caries	1,485	297.0	0.48	23.4
Diseases of the pulp/periapical tissue	679	135.8	0.22	10.7
Dentofacial anomalies/malocclusion	655	131.0	0.21	10.3
Gingivitis/periodontal diseases	375	75.0	0.12	5.9
Other disorders of the teeth/supporting structures	169	33.8	0.05	2.7
Other diseases of the teeth hard tissue	146	29.2	0.05	2.3
Disorders of tooth development/eruption	133	26.6	0.04	2.1
Other disorders of the gingiva/edentulous alveolar ridge	25	5.0	0.01	0.4
Total 15–24 years	6,344	1,268.8	2.04	100.0

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population

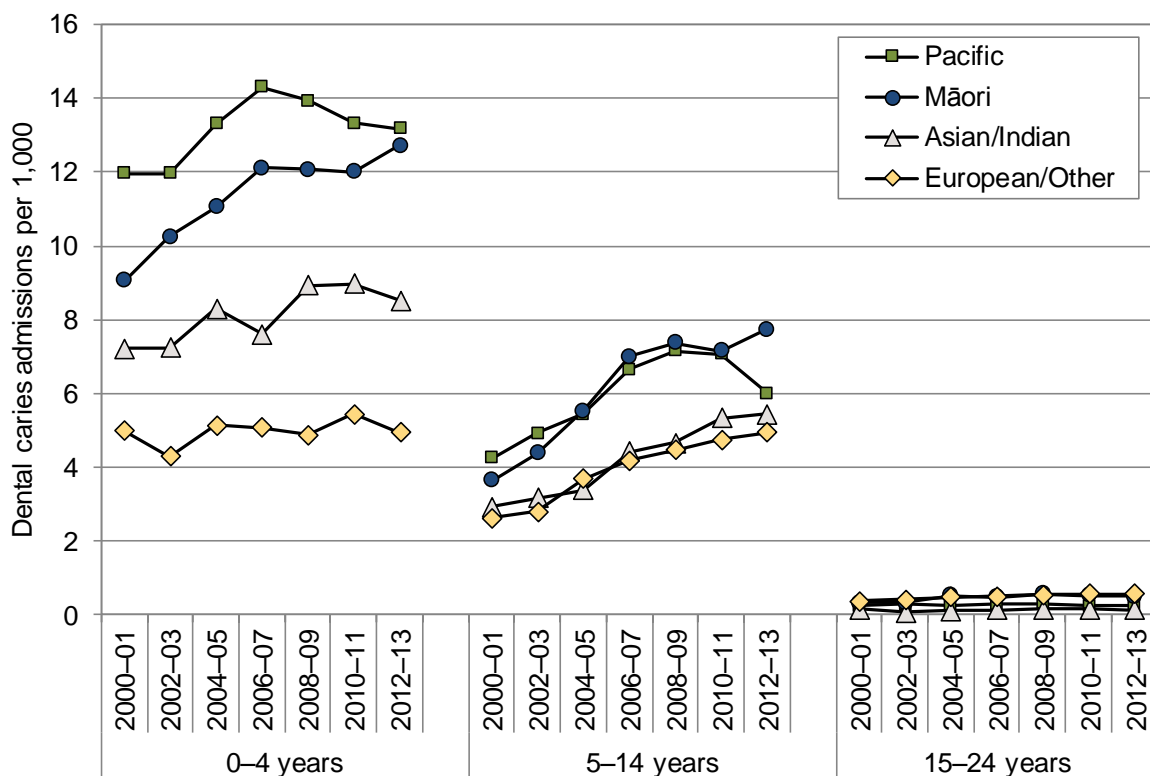
New Zealand Distribution by Ethnicity, NZDep Index decile, and Gender

In New Zealand during 2009–2013, hospital admissions for dental caries in children aged 0–4 years were *significantly higher* for males, Pacific, Māori, and Asian/Indian children (compared to European/Other children), and for those from average-to-most deprived areas (NZDep decile 4–10) (Table 36).

Similarly, admissions for children aged 5–14 years were *significantly higher* for males, Māori and Pacific > Asian/Indian children (compared to European/Other children), and for those from average-to-more deprived areas (NZDep decile 3–10) (Table 36).

In contrast, for young people aged 15–24 years, admissions were *significantly lower* for Asian/Indian and Pacific young people (compared to European/Other young people), and *significantly higher* for those from more deprived areas (NZDep decile 6–9) (Table 36). Similar ethnic differences were seen during 2000–2013 (Figure 138).

Figure 138. Hospital admissions for dental caries in children and young people aged 0–24 years by ethnicity, New Zealand 2000–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population.
Note: Ethnicity is level 1 prioritised



Table 36. Hospital admissions for dental caries in children and young people aged 0–24 years by gender, ethnicity, and NZ deprivation index decile, New Zealand 2009–2013

Variable	Rate	Rate ratio	95% CI	Variable	Rate	Rate ratio	95% CI
New Zealand							
Dental caries admissions 0–4 years							
NZ Deprivation Index decile				NZ Deprivation Index quintile			
Decile 1	4.24	1.00		Decile 1–2	4.24	1.00	
Decile 2	4.24	1.00	0.89–1.13	Decile 3–4	5.05	1.19	1.10–1.29
Decile 3	4.63	1.09	0.97–1.23	Decile 5–6	6.85	1.62	1.50–1.74
Decile 4	5.47	1.29	1.15–1.45	Decile 7–8	9.06	2.14	2.00–2.29
Decile 5	6.78	1.60	1.44–1.78	Decile 9–10	13.57	3.20	3.00–3.42
Decile 6	6.93	1.64	1.47–1.82	Prioritised ethnicity			
Decile 7	8.28	1.96	1.76–2.17	Māori	12.29	2.37	2.28–2.47
Decile 8	9.73	2.30	2.08–2.54	Pacific	13.14	2.54	2.41–2.68
Decile 9	11.95	2.82	2.56–3.11	Asian/Indian	8.74	1.69	1.59–1.79
Decile 10	15.06	3.56	3.24–3.91	European/Other	5.18	1.00	
Gender							
Female	7.98	1.00		Male	8.56	1.07	1.04–1.11
Dental caries admissions 5–14 years							
NZ Deprivation Index decile				NZ Deprivation Index quintile			
Decile 1	3.38	1.00		Decile 1–2	3.33	1.00	
Decile 2	3.28	0.97	0.89–1.06	Decile 3–4	4.15	1.25	1.17–1.32
Decile 3	3.75	1.11	1.02–1.21	Decile 5–6	5.45	1.64	1.55–1.73
Decile 4	4.55	1.35	1.24–1.47	Decile 7–8	6.81	2.05	1.94–2.16
Decile 5	5.26	1.56	1.44–1.69	Decile 9–10	8.40	2.52	2.40–2.66
Decile 6	5.66	1.68	1.55–1.82	Prioritised ethnicity			
Decile 7	6.44	1.91	1.77–2.06	Māori	7.49	1.55	1.50–1.61
Decile 8	7.14	2.11	1.96–2.28	Pacific	6.67	1.38	1.32–1.45
Decile 9	8.04	2.38	2.21–2.56	Asian/Indian	5.34	1.11	1.05–1.17
Decile 10	8.71	2.58	2.40–2.77	European/Other	4.82	1.00	
Gender							
Female	5.60	1.00		Male	5.87	1.05	1.02–1.08
Dental caries admissions 15–24 years							
NZ Deprivation Index decile				NZ Deprivation Index quintile			
Decile 1	0.38	1.00		Decile 1–2	0.34	1.00	
Decile 2	0.30	0.81	0.60–1.08	Decile 3–4	0.35	1.02	0.83–1.26
Decile 3	0.35	0.92	0.68–1.23	Decile 5–6	0.48	1.43	1.19–1.73
Decile 4	0.34	0.91	0.68–1.22	Decile 7–8	0.59	1.75	1.47–2.09
Decile 5	0.47	1.23	0.94–1.61	Decile 9–10	0.55	1.63	1.37–1.94
Decile 6	0.50	1.33	1.02–1.74	Prioritised ethnicity			
Decile 7	0.55	1.46	1.13–1.89	Māori	0.55	0.98	0.86–1.10
Decile 8	0.62	1.65	1.29–2.10	Pacific	0.29	0.52	0.41–0.65
Decile 9	0.62	1.64	1.29–2.08	Asian/Indian	0.14	0.25	0.19–0.32
Decile 10	0.48	1.28	1.00–1.65	European/Other	0.56	1.00	
Gender							
Female	0.49	1.00		Male	0.47	0.96	0.87–1.07

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population.
 Note: Rates are per 1,000; Ethnicity is level 1 prioritised; Decile is NZDep2006



Northern DHBs Distribution and Trends

Northern DHBs Distribution by Primary Diagnosis

In all four Northern DHBs during 2009–2013, dental caries were the leading reason for a dental admission in children aged 0–4 and 5–14 years, while embedded/ impacted teeth were the leading reason for an admission in young people aged 15–24 years (**Table 37–Table 40**).

Table 37. Hospital admissions for dental conditions in children and young people aged 0–24 years, Northland 2009–2013

Primary diagnosis	Number: total 2009–2013	Number: annual average	Rate per 1,000	Percent
Northland				
0–4 years				
Dental caries	860	172.0	14.66	95.7
Diseases of the pulp/periapical tissue	32	6.4	0.55	3.6
Disorders of tooth development/eruption	3	0.6	0.05	0.3
Gingivitis/periodontal diseases	<3	s	s	s
Other disorders of the teeth/supporting structures	<3	s	s	s
Dentofacial anomalies/malocclusion	<3	s	s	s
Total 0–4 years	899	179.8	15.32	100.0
5–14 years				
Dental caries	1,030	206.0	8.45	86.4
Diseases of the pulp/periapical tissue	47	9.4	0.39	3.9
Embedded/impacted teeth	46	9.2	0.38	3.9
Disorders of tooth development/eruption	34	6.8	0.28	2.9
Dentofacial anomalies/malocclusion	16	3.2	0.13	1.3
Other diseases of the teeth hard tissue	8	1.6	0.07	0.7
Other disorders of the teeth/supporting structures	6	1.2	0.05	0.5
Gingivitis/periodontal diseases	5	1.0	0.04	0.4
Total 5–14 years	1,192	238.4	9.78	100.0
15–24 years				
Embedded/impacted teeth	75	15.0	0.78	33.2
Dental caries	62	12.4	0.65	27.4
Diseases of the pulp/periapical tissue	36	7.2	0.38	15.9
Dentofacial anomalies/malocclusion	29	5.8	0.30	12.8
Gingivitis/periodontal diseases	9	1.8	0.09	4.0
Other disorders of the teeth/supporting structures	7	1.4	0.07	3.1
Disorders of tooth development/eruption	5	1.0	0.05	2.2
Other diseases of the teeth hard tissue	<3	s	s	s
Other disorders of the gingiva/edentulous alveolar ridge	<3	s	s	s
Total 15–24 years	226	45.2	2.36	100.0

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population.

Note: s: suppressed due to small numbers



Table 38. Hospital admissions for dental conditions in children and young people aged 0–24 years, Waitemata DHB 2009–2013

Primary diagnosis	Number: total 2009–2013	Number: annual average	Rate per 1,000	Percent
Waitemata				
0–4 years				
Dental caries	978	195.6	5.12	83.9
Diseases of the pulp/periapical tissue	131	26.2	0.69	11.2
Disorders of tooth development/eruption	17	3.4	0.09	1.5
Other disorders of the teeth/supporting structures	13	2.6	0.07	1.1
Gingivitis/periodontal diseases	13	2.6	0.07	1.1
Dentofacial anomalies/malocclusion	4	0.8	0.02	0.3
Other disorders of the gingiva/edentulous alveolar ridge	4	0.8	0.02	0.3
Other diseases of the teeth hard tissue	4	0.8	0.02	0.3
Embedded/impacted teeth	<3	s	s	s
Total 0–4 years	1,165	233.0	6.10	100.0
5–14 years				
Dental caries	1,316	263.2	3.59	74.7
Diseases of the pulp/periapical tissue	199	39.8	0.54	11.3
Disorders of tooth development/eruption	103	20.6	0.28	5.8
Embedded/impacted teeth	41	8.2	0.11	2.3
Dentofacial anomalies/malocclusion	36	7.2	0.10	2.0
Other diseases of the teeth hard tissue	31	6.2	0.08	1.8
Other disorders of the teeth/supporting structures	27	5.4	0.07	1.5
Gingivitis/periodontal diseases	7	1.4	0.02	0.4
Other disorders of the gingiva/edentulous alveolar ridge	<3	s	s	s
Total 5–14 years	1,762	352.4	4.81	100.0
15–24 years				
Embedded/impacted teeth	182	36.4	0.48	34.1
Dental caries	121	24.2	0.32	22.7
Diseases of the pulp/periapical tissue	78	15.6	0.21	14.6
Dentofacial anomalies/malocclusion	53	10.6	0.14	9.9
Other disorders of the teeth/supporting structures	40	8.0	0.11	7.5
Other diseases of the teeth hard tissue	29	5.8	0.08	5.4
Gingivitis/periodontal diseases	18	3.6	0.05	3.4
Disorders of tooth development/eruption	10	2.0	0.03	1.9
Other disorders of the gingiva/edentulous alveolar ridge	3	0.6	0.01	0.6
Total 15–24 years	534	106.8	1.41	100.0

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population.
 Note: s: suppressed due to small numbers



Table 39. Hospital admissions for dental conditions in children and young people aged 0–24 years, Auckland DHB 2009–2013

Primary diagnosis	Number: total 2009–2013	Number: annual average	Rate per 1,000	Percent
Auckland DHB				
0–4 years				
Dental caries	783	156.6	5.32	83.1
Diseases of the pulp/periapical tissue	119	23.8	0.81	12.6
Disorders of tooth development/eruption	16	3.2	0.11	1.7
Other disorders of the teeth/supporting structures	7	1.4	0.05	0.7
Dentofacial anomalies/malocclusion	7	1.4	0.05	0.7
Other disorders of the gingiva/edentulous alveolar ridge	4	0.8	0.03	0.4
Gingivitis/periodontal diseases	3	0.6	0.02	0.3
Other diseases of the teeth hard tissue	<3	s	s	s
Embedded/impacted teeth	<3	s	s	s
Total 0–4 years	942	188.4	6.40	100.0
5–14 years				
Dental caries	955	191.0	3.64	76.7
Diseases of the pulp/periapical tissue	159	31.8	0.61	12.8
Disorders of tooth development/eruption	57	11.4	0.22	4.6
Embedded/impacted teeth	24	4.8	0.09	1.9
Other diseases of the teeth hard tissue	17	3.4	0.06	1.4
Other disorders of the teeth/supporting structures	14	2.8	0.05	1.1
Dentofacial anomalies/malocclusion	14	2.8	0.05	1.1
Gingivitis/periodontal diseases	5	1.0	0.02	0.4
Total 5–14 years	1,245	249.0	4.75	100.0
15–24 years				
Embedded/impacted teeth	130	26.0	0.35	38.6
Dental caries	75	15.0	0.20	22.3
Diseases of the pulp/periapical tissue	60	12.0	0.16	17.8
Gingivitis/periodontal diseases	24	4.8	0.07	7.1
Dentofacial anomalies/malocclusion	21	4.2	0.06	6.2
Other diseases of the teeth hard tissue	16	3.2	0.04	4.7
Other disorders of the teeth/supporting structures	9	1.8	0.02	2.7
Disorders of tooth development/eruption	<3	s	s	s
Total 15–24 years	337	67.4	0.91	100.0

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population.
 Note: s: suppressed due to small numbers



Table 40. Hospital admissions for dental conditions in children and young people aged 0–24 years, Counties Manukau 2009–2013

Primary diagnosis	Number: total 2009–2013	Number: annual average	Rate per 1,000	Percent
Counties Manukau				
0–4 years				
Dental caries	1,563	312.6	7.75	79.7
Diseases of the pulp/periapical tissue	337	67.4	1.67	17.2
Gingivitis/periodontal diseases	16	3.2	0.08	0.8
Disorders of tooth development/eruption	15	3.0	0.07	0.8
Other disorders of the teeth/supporting structures	13	2.6	0.06	0.7
Dentofacial anomalies/malocclusion	5	1.0	0.02	0.3
Other diseases of the teeth hard tissue	5	1.0	0.02	0.3
Embedded/impacted teeth	4	0.8	0.02	0.2
Other disorders of the gingiva/edentulous alveolar ridge	<3	s	s	s
Total 0–4 years	1,960	392.0	9.71	100.0
5–14 years				
Dental caries	1,795	359.0	4.61	77.7
Diseases of the pulp/periapical tissue	318	63.6	0.82	13.8
Disorders of tooth development/eruption	89	17.8	0.23	3.9
Other diseases of the teeth hard tissue	32	6.4	0.08	1.4
Other disorders of the teeth/supporting structures	26	5.2	0.07	1.1
Embedded/impacted teeth	24	4.8	0.06	1.0
Dentofacial anomalies/malocclusion	13	2.6	0.03	0.6
Gingivitis/periodontal diseases	10	2.0	0.03	0.4
Other disorders of the gingiva/edentulous alveolar ridge	<3	s	s	s
Total 5–14 years	2,309	461.8	5.93	100.0
15–24 years				
Embedded/impacted teeth	121	24.2	0.32	28.3
Dental caries	111	22.2	0.30	25.9
Diseases of the pulp/periapical tissue	89	17.8	0.24	20.8
Dentofacial anomalies/malocclusion	45	9.0	0.12	10.5
Gingivitis/periodontal diseases	25	5.0	0.07	5.8
Other diseases of the teeth hard tissue	15	3.0	0.04	3.5
Disorders of tooth development/eruption	12	2.4	0.03	2.8
Other disorders of the teeth/supporting structures	9	1.8	0.02	2.1
Other disorders of the gingiva/edentulous alveolar ridge	<3	s	s	s
Total 15–24 years	428	85.6	1.15	100.0

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population.
 Note: s: suppressed due to small numbers



Northern DHBs vs. New Zealand

In Northland during 2009–2013, hospital admissions for dental caries were *significantly higher* than the New Zealand rate in all three age groups (0–4 years, 5–14 years, 15–24 years), while in the Waitemata, Auckland and Counties Manukau DHBs rates were *significantly lower* (**Table 41**).

Table 41. Hospital admissions for dental caries in children and young people aged 0–24 years, Northern DHBs vs. New Zealand 2009–2013

DHB	Number: total 2009– 2013	Number: annual average	Rate per 1,000	Rate ratio	95% CI
Dental caries					
0–4 years					
Northland	860	172.0	14.7	1.77	1.65–1.90
Waitemata	978	195.6	5.1	0.62	0.58–0.66
Auckland	783	156.6	5.3	0.64	0.60–0.69
Counties Manukau	1,563	312.6	7.7	0.94	0.89–0.99
New Zealand	12,600	2,520.0	8.3	1.00	
5–14 years					
Northland	1,030	206.0	8.4	1.47	1.38–1.57
Waitemata	1,316	263.2	3.6	0.63	0.59–0.66
Auckland	955	191.0	3.6	0.63	0.59–0.68
Counties Manukau	1,795	359.0	4.6	0.80	0.77–0.84
New Zealand	17,166	3,433.2	5.7	1.00	
15–24 years					
Northland	62	12.4	0.6	1.35	1.05–1.75
Waitemata	121	24.2	0.3	0.67	0.55–0.80
Auckland	75	15.0	0.2	0.43	0.34–0.54
Counties Manukau	111	22.2	0.3	0.62	0.51–0.75
New Zealand	1,485	297.0	0.5	1.00	

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population

Northern DHB Trends

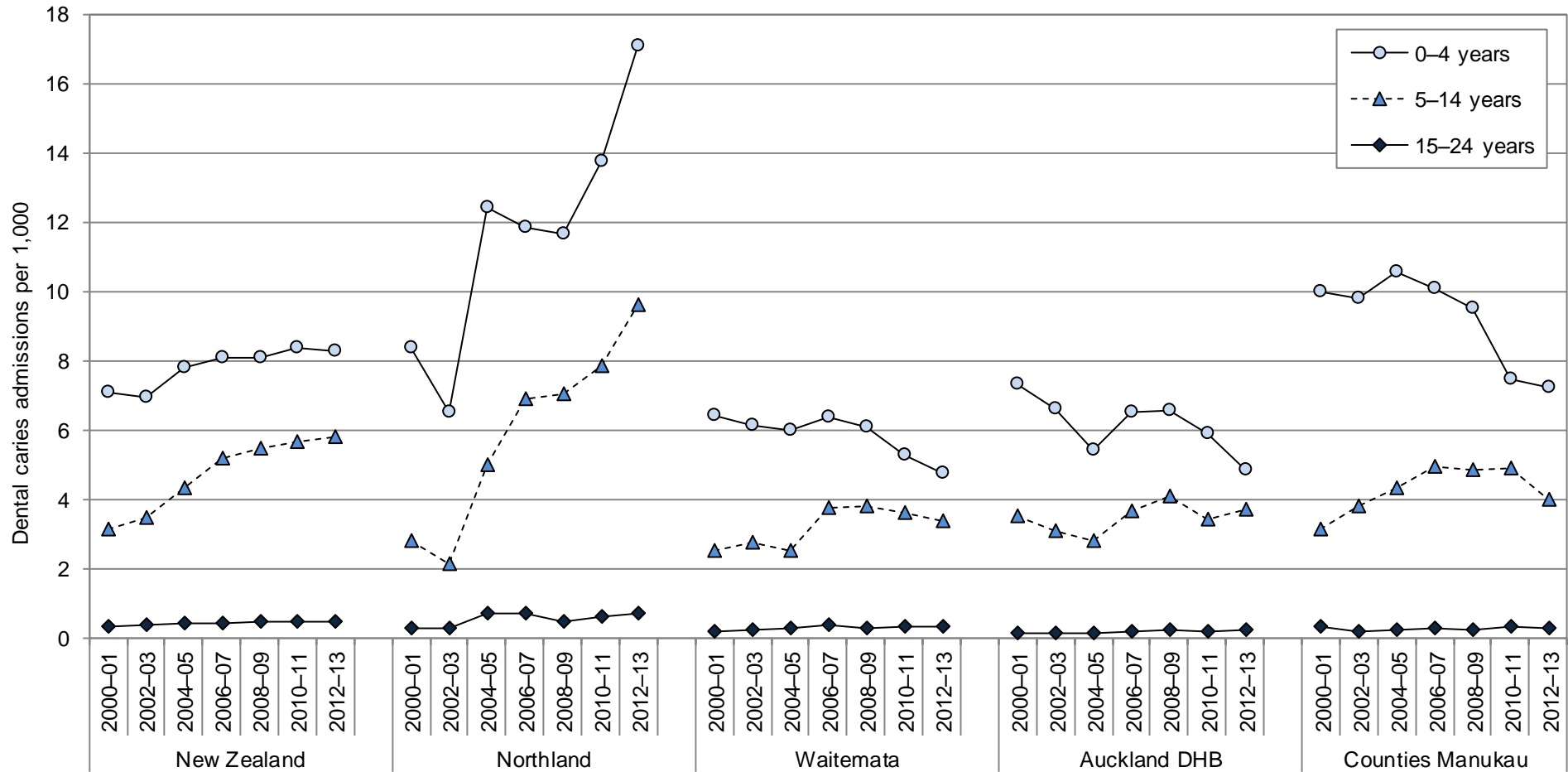
In Northland during 2000–2013, hospital admissions for dental caries increased in all three age groups (0–4 years, 5–14 years, and 15–24 years), while in the Waitemata and Auckland DHBs rates were more static. In Counties Manukau, admissions in children aged 0–4 years declined after 2004–05, while rates in children 5–14 years increased in the early 2000s but then flattened off from 2006–07 (**Figure 139**).

Northern DHBs Distribution by Ethnicity

In the Waitemata, Auckland and Counties Manukau DHBs during 2000–2013, hospital admissions for dental caries in children aged 0–4 years were generally higher for Pacific > Māori and Asian/Indian > European/Other children, although in the 5–14 year age group these differences were less consistent. In Northland, admissions in both age groups were higher for European/Other than for Māori children. Small numbers precluded an analysis of ethnic differences for young people aged 15–24 years (**Figure 140**).

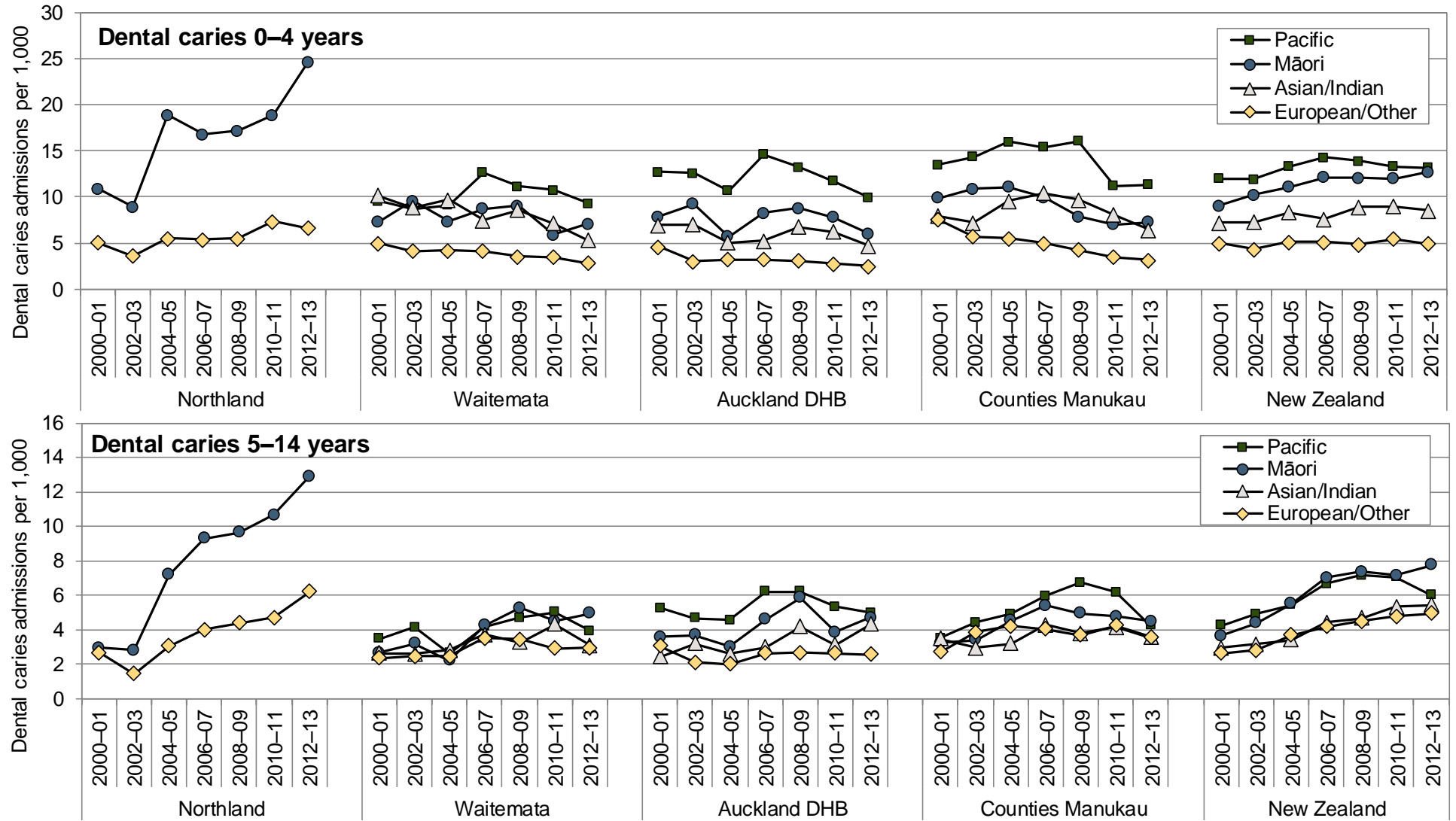


Figure 139. Hospital admissions for dental caries in children and young people aged 0–24 years, Northern DHBs vs. New Zealand 2000–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population

Figure 140. Hospital admissions for dental caries in children 0–14 years by ethnicity, Northern DHBs vs. New Zealand 2000–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population. Note: Ethnicity is level 1 prioritised

Local Policy Documents and Evidence-Based Reviews Relevant to Oral Health in Children and Young People

In New Zealand, there are a number of Ministry of Health publications that provide guidance to the health sector on the establishment of optimal oral health services, the identification of those most at risk of poor oral health, and the roles the Ministry of Health and DHBs are expected to play in improving oral health outcomes for children and young people. In addition, there are a large number of reviews in the international literature concerning the effectiveness of particular interventions in the prevention and management of dental caries in this age group. These publications are briefly summarised in **Table 42**.

Table 42. Local policy documents and evidence based reviews relevant to oral health

Ministry of Health publications
<p>Ministry of Health. 2013. Community Water Fluoridation. Wellington: Ministry of Health. http://www.health.govt.nz/system/files/documents/publications/water-fluoridation.pdf</p> <p>This brief pamphlet provides information for the general public about the benefits and safety of water fluoridation.</p>
<p>Cram F, Oakden J & Wehipeihana N. 2011. Future Directions for a Māori Dental Therapy Workforce. Wellington: Ministry of Health. http://www.health.govt.nz/system/files/documents/publications/future-directions-maori-dental-workforce_0.pdf</p> <p>This is the report of a project which examined the current and future needs of the Māori dental therapy workforce considering the supply of Māori dental therapists and the oral health service requirements of Māori children and young people. The report authors note that Māori children have a higher severity of dental caries than non-Māori children and that the Māori population is growing so that the proportion of children who are Māori will increase over time. They state that the number of Māori dental therapists needs to increase and that at least 8–10 Māori students need to begin training as dental therapists each year. To achieve this, more Māori students need to study science subjects in their final years at secondary school, the science curriculum may need to be made more relevant to Māori students, and tertiary scholarships need to be provided. District health boards need to ensure that the working conditions and salaries of dental therapists in the public service are attractive and that Māori dental therapists are supported to practice.</p>
<p>Ministry of Health. 2008. Promoting Oral Health: A toolkit to assist the development, planning, implementation and evaluation of oral health promotion in New Zealand. Wellington: Ministry of Health. http://www.health.govt.nz/system/files/documents/publications/promoting-oralhealth-a-toolkit-jan08.pdf</p> <p>This toolkit, written for policy makers, planners and funders, oral health professionals and other interested persons, is a practical guide for the design, delivery and implementation of oral health promotion programmes. It does not include a review of the evidence for oral health promotion interventions.</p>
<p>Ministry of Health. 2008. Early Childhood Oral Health: A toolkit for District Health Boards, primary health care and public health providers and for oral health services relating to infant and preschool oral health. Wellington: Ministry of Health. http://www.health.govt.nz/system/files/documents/publications/early-childhood-oral-health-a-toolkit-feb08.pdf</p> <p>The key objective of this toolkit for policy makers, funders, managers, clinical leaders and clinicians is to suggest a strategy of identifying children at greatest risk and targeting finite resources to those with the greatest need in order to reduce inequalities (while still maintaining universal access for all infants and pre-school children.) It recommends that Well Child/Tamariki Ora and other non-oral health providers conduct an enrolment and risk assessment process for all children at between 9 and 12 months of age and facilitate early contact with an oral health provider for examination and preventive and treatment services (if necessary) for those identified at highest risk of early childhood caries. This will require the development of a risk assessment tool (“Lift the Lip”) and training for non-oral health providers.</p>
New Zealand guidelines
<p>New Zealand Guidelines Group. 2009. Guidelines for the Use of Fluorides. Wellington: Ministry of Health. http://www.health.govt.nz/system/files/documents/publications/guidelines-for-the-use-of-fluoride-nov09.pdf</p> <p>These evidence-based best practice guidelines are aimed at providers of oral health care. They are based on a 2006 Australian guideline, a systematic review of international literature published since 2006 (RCTs and systematic reviews only) and relevant New Zealand research. They are not fully evidence-based guidelines (since the available evidence was not systematically and critically appraised and the recommendations are not accompanied by grades indicating the quality of the evidence on which they are based) but they are very well referenced. They deal with the use of topical fluoride treatments (including toothpastes, mouthrinse, varnishes, gels and foams) and fluoride tablets, but not water fluoridation or dietary fluoride intake. A fluoride algorithm is provided as a summary of the guidelines.</p>

New Zealand Dental Association. 2008. **Healthy Smile, Healthy Child: Oral Health Guide for Well Child Providers.** Auckland: New Zealand Dental Association. http://www.healthysmiles.org.nz/assets/pdf/HealthySmilesBooklet-3rdEdition_sml.pdf

This publication is a training curriculum and guide for Well Child/Tamariki Ora providers. It aims to reduce oral health inequality by giving Well Child service providers the knowledge and understanding to provide families with early anticipatory guidance about the prevention of Early Childhood Caries (ECC).

International guidelines

Scottish Intercollegiate Guidelines Network (SIGN). 2014. **Dental interventions to prevent caries in children.** Edinburgh: Scottish Intercollegiate Guidelines Network. <http://www.sign.ac.uk/pdf/SIGN138.pdf>

This guideline is intended for healthcare professionals providing oral health advice to children in a one-to-one situation. It is based on a systematic review of the research evidence (2000–2011) relating to 12 key questions. Recommendations in the guideline are accompanied by letter grades indicating the strength of the evidence on which they are based. The key recommendations are: All children should be advised to brush twice daily with fluoride toothpaste, fluoride varnish should be applied twice yearly in all children, and resin-based fissure sealants should be applied to children's permanent molars as soon after eruption as practicable.

A short summary of the main recommendations in this guideline can be found in the quick reference guide: <http://www.sign.ac.uk/pdf/QRG138.pdf>

Irish Oral Health Services Guideline Initiative. 2012. **Oral Health Assessment: Best practice guidance for providing an oral health assessment programme for school-aged children in Ireland.** <http://www.ucc.ie/en/media/research/ohsrc/OralHealthAssessmentFull.pdf>

This evidence-based guideline is intended for those involved in planning and providing public dental services for children and adolescents in Ireland, where the Health Service Executive has statutory responsibility to make dental services available to children under the age of 16, free of charge. It covers best practice for conducting oral health assessments (OHAs), the timing, frequency and appropriate setting of OHAs for school-aged children, the cost-effectiveness of conducting OHAs in the school and in the clinic, and data collection and audit. It does not cover treatment of conditions identified during OHAs. The recommendations in the guideline are accompanied by letter grades indicating the strength of the evidence on which they are based (using the SIGN grading system).

Adewale L, Morton N, Blayney M. 2011. **Guidelines For The Management Of Children Referred For Dental Extractions Under General Anaesthesia** London: Association of Paediatric Anaesthetists of Great Britain and Ireland. <http://www.rcoa.ac.uk/system/files/PUB-DentalExtractions.pdf>

These evidence-based guidelines address 12 "key questions" relating to anaesthesia for children and young people who may require general anaesthesia for dental extractions. They cover assessment and preparation, how to reduce the requirement for general anaesthesia (especially, repeat general anaesthesia) for dental care, minimum standards for staff seniority and competencies, perioperative monitoring, anaesthetic techniques and regimens, staffing and equipment levels, discharge criteria, and procedures and advice about post-operative care following discharge. Levels of evidence and recommendations are graded using the SIGN methodology.

Scottish Dental Clinical Effectiveness Programme; a division of the NHS. 2010. **Prevention and Management of Dental Caries in Children: Dental Clinical Guidance.** Dundee: Scottish Dental Clinical Effectiveness Programme. <http://www.sdcep.org.uk/index.aspx?o=2858>

This detailed guidance is intended for practitioners providing primary dental care to children, from birth until the age of 16 years. It includes advice on: assessment of the child; delivery of preventive care according to caries risk, choosing the appropriate caries management option; delivery of restorative care; recall and referral; providing additional support; and management of suspected dental neglect.

A summary version of this guidance can be downloaded here: <http://www.sdcep.org.uk/index.aspx?o=2865>, and number of supporting tools to assist dental professionals to follow the guidance recommendations can be downloaded here: <http://www.sdcep.org.uk/index.aspx?o=2865>.

Irish Oral Health Services Guideline Initiative. 2010. **Pit and Fissure Sealants: Evidence-based guidance on the use of sealants for the prevention and management of pit and fissure caries.** <http://www.ucc.ie/en/media/research/ohsrc/PitandFissureSealantsFull.pdf>

This guideline covers the use of pit and fissure sealants for the prevention and management of caries in the pits and fissures of primary and permanent teeth in children, adolescents and adults. It is based on three source guidelines (from the American Dental Association, the CDC and the Haute Autorité de Santé) together with systematic reviews, clinical trials and economic evaluations, published between 2004 and February 2010, which could be used to update these guidelines, and also a separate literature review of systematic and narrative reviews relating to caries detection methods and adverse effects of pit and fissure sealants. Recommendations are accompanied by letter grades indicating the strength of the evidence on which they are based. The evidence tables for this guideline are available here: <http://www.ucc.ie/en/media/research/ohsrc/PitandFissureSealantsEvidenceTables.pdf>, and the methodology supplement, here: <http://www.ucc.ie/en/media/research/ohsrc/PitandFissureSealantsMethodologySupplement.pdf>.

Irish Oral Health Services Guideline Initiative. 2009. **Strategies to prevent dental caries in children and adolescents: Evidence-based guidance on identifying high caries risk children and developing preventive strategies for high caries risk children in Ireland (Full guideline).**

<http://www.ucc.ie/en/media/research/ohsrc/PreventDentalCariesFull.pdf>

This guideline was developed for the public dental service in Ireland. It covers approaches to identifying “high caries risk” children, both at the individual and the population level, and effective caries prevention strategies in these children, both at the individual and the population level. Recommendations are accompanied by letter grades indicating the strength of the evidence on which they are based (using the SIGN grading system). A summary of the guideline can be found here: <http://www.ucc.ie/en/media/research/ohsrc/PreventDentalCariesSummary.pdf> and the evidence tables on which the guideline was based, here:

<http://www.ucc.ie/en/media/research/ohsrc/PreventDentalCariesEvidenceTables.pdf>

Recent evidence-based medicine reviews

The American Dental Association (ADA) Council on Scientific Affairs. 2013. **Topical fluoride for caries prevention**
ADA Center for Evidence-Based Dentistry.

<http://ebd.ada.org/contentdocs/Topical fluoride for caries prevention 2013 update - full manuscript.pdf>

These clinical recommendations from the American Dental Association, which are an update of 2006 recommendations, are based on a systematic review of 71 trials, reported in 82 articles, assessing the efficacy of various topical caries-preventive agents. Articles included in the review were published in English and listed in either PubMed or the Cochrane library. Included trials were prospective controlled clinical studies in humans, either randomised or non-randomised, of fluoride agents requiring professional application or prescription, that reported caries incidence, arrest or reversal as outcome measures. When possible, meta-analysis was used to combine results of studies. The review panel concluded that there was evidence for the efficacy of some agents for preventing and controlling tooth decay. These agents included 2.26% fluoride varnishes, 1.23% fluoride gels, prescription-strength, home-use 0.5% fluoride gels/pastes, and prescription-strength, home-use 0.09% fluoride mouthrinses. The evidence indicated that 0.1% fluoride varnishes or prophylaxis pastes containing fluoride were not efficacious for preventing tooth decay. There was insufficient evidence on the efficacy or otherwise of 1.23% fluoride foams. The review authors noted that many trials had been conducted many years ago when background fluoride exposures in the general population were lower (due to lack of water fluoridation and toothpastes being fluoride free) and that by modern standards the quality of many studies was sub-optimal. Most studies did not report on arrest or reversal of caries.

Chou R, Cantor A, Zakher B, et al. 2013. **Preventing Dental Caries in Children <5 Years: Systematic Review Updating USPSTF Recommendation.** Pediatrics, 132(2), 332–50.

<http://pediatrics.aappublications.org/content/132/2/332.abstract>

This review was commissioned by the USPSTF to update its previous (2004) recommendations on the prevention of dental caries in children < 5 years of age. The review included both trials and observational studies, identified through searches of Medline and the Cochrane library. There were no studies on the effects of screening by primary care providers on clinical outcomes. On good-quality cohort study found that examination by a paediatrician was associated with a sensitivity of 0.76 for detecting a child with caries. There were no new trials of fluoride supplementation. There were three new trials of fluoride varnish which found that it was more effective than no fluoride varnish (reduction in caries increment of 18 to 59%). There were three trials of xylitol with inconclusive results regarding its effect on caries. Five new observational studies were consistent with previous evidence in finding an association between early childhood fluoride use and dental fluorosis. The review authors found no evidence on the accuracy of risk prediction instruments in primary care settings. They concluded that there was no direct evidence that screening by primary care clinicians is effective at reducing childhood caries but that new evidence supports the use of fluoride varnishes in high-risk children and evidence reviewed in earlier USPSTF reviews indicated that oral fluoride supplementation is effective in reducing caries incidence.

Hujoel PP. 2013. **Vitamin D and dental caries in controlled clinical trials: systematic review and meta-analysis.** Nutrition Reviews, 71(2), 88–97.

The author of this review notes that, in the two decades following discovery of vitamin D on dental caries, but that in recent times the possible association between vitamin D and dental caries has largely been ignored. His systematic review included 24 controlled clinical trials involving a total of 2,827 children. Twenty-two of the trials were conducted more than fifty years ago, and, by modern standards most of them have a variety of methodological shortcomings. The two other trials, both of which compared UV therapy to no UV therapy, were published in 1975 and 1989. Using random-effects and meta-regression models, the pooled relative-rate estimate of supplemental vitamin D was found to be 0.53 (95% CI 0.43–0.65). There were no robust differences found between the caries-preventive effects of vitamin D₂, vitamin D₃ and ultraviolet radiation. The author stated that his analysis identified vitamin D as a promising caries-preventive agent, leading to a low-certainty conclusion that vitamin D may reduce the incidence of dental caries. This review was assessed by the CRD. Their commentary stated that, “Overall, the author's cautious conclusions reflect the limitations of the data and appear to be appropriate”. The CRD commentary can be found here:

http://www.crd.york.ac.uk/CRDWeb/ShowRecord.asp?AccessionNumber=12013012303&UserID=0#.U17ES_mSx8E

The American Dental Association (ADA) Council on Scientific Affairs. 2011. **Non-fluoride caries preventive agents: Full report of a systematic review and evidence-based recommendations** Chicago: ADA Center For Evidence Based Dentistry.

http://ebd.ada.org/contentdocs/clinical_recommendations_non_fluoride_caries_preventive_agents_full_report.pdf

This review aimed to evaluate studies of non-fluoride caries-preventive agents on the market in the US. The review authors stated that the use of fluoridated toothpastes, fluoridated municipal water, other topically applied fluorides and pit and fissure sealants, together with dietary improvement, remain mainstays of caries management and that non-fluoride agents may serve as adjunctive therapies for preventing, arresting or even reversing dental caries. The non-fluoride agents evaluated were: sucrose-free polyol chewing gums, xylitol dentifrices, chlorhexidine, chlorhexidine in combination with thymol, calcium-containing agents, phosphate-containing agents, casein derivatives, sialogogues, iodine and triclosan. Altogether the review considered 71 published articles, describing 50 RCTs and 15 non-randomised studies, assessing the benefits of various non-fluoride caries preventive agents. The review panel recommended sucrose-free chewing gum (containing either xylitol only or polyol combinations) or xylitol lozenges for caries prevention. They also found that a 1:1 mixture of chlorhexidine/thymol varnish may be efficacious in the prevention of root caries.

Berg J, Gerweck C, Hujuel PP, et al. 2011. **Evidence-Based Clinical Recommendations Regarding Fluoride Intake From Reconstituted Infant Formula and Enamel Fluorosis: A Report of the American Dental Association Council on Scientific Affairs.** The Journal of the American Dental Association, 142(1), 79–87.

<http://jada.ada.org/content/142/1/79.abstract>

The fluoride content of infant formula depends largely on the fluoride content of the water use to reconstitute it since the powdered concentrate typically contains only low concentrations of fluoride. Human breast milk normally has low levels of fluoride. These recommendations are based on one systematic review (see below) and two clinical studies. The systematic review was commissioned by the American Dental Association and it concluded that, based on the findings of 17 observational studies, in infants aged 0–24 months consumption of infant formula is associated with an increased risk of developing at least some detectable level of dental fluorosis (OR=1.81; 95% CI 1.44–2.26). Due to limited information provided by the studies included in this review, the review authors were unable to determine whether the increased risk of fluorosis was due to fluoride intake. The majority of guideline's expert panel concluded that parents and caregivers of infants up to 12 months should be advised to use optimally fluoridated drinking water when making up formula and that if they had concerns about dental fluorosis they could use ready-to-feed formula or make up formula using fluoride-free water.

The review on which this guideline is largely based is: Hujuel PP, Zina LG, Moimaz SAS, et al. 2009. **Infant Formula and Enamel Fluorosis: A Systematic Review.** The Journal of the American Dental Association, 140(7), 841–54. <http://jada.ada.org/content/140/7/841.abstract> .

Rozier RG, Adair S, Graham F, et al. 2010. **Evidence-Based Clinical Recommendations on the Prescription of Dietary Fluoride Supplements for Caries Prevention: A Report of the American Dental Association Council on Scientific Affairs.** The Journal of the American Dental Association, 141(12), 1480–89.

<http://jada.ada.org/content/141/12/1480.abstract>

These evidence-based recommendations are based on three systematic reviews and two clinical studies published between May 18th, 2008 and Dec 11th, 2009. The expert panel concluded that fluoride supplements are effective in preventing caries but that because there have been increases in children's exposure to fluoride from multiple sources and increases in the prevalence of dental fluorosis, fluoride supplements are only recommended for children at high risk of developing dental caries. They suggest that clinicians use tools such as those developed by the ADA and the American Academy of Pediatric Dentistry to determine children's risk status.

Murdoch Children's Research Institute. 2009. **Maternal and Child Oral Health - Systematic Review and Analysis: a report for the New Zealand Ministry of Health.** Wellington: Ministry of Health.

<http://www.health.govt.nz/system/files/documents/publications/maternal-infant-oral-healthv2-aug09.pdf>

Early childhood caries (ECC) has its origins in the first year of life and so primary prevention interventions need to be implemented early, possibly before birth. The aim of this review was to report on the evidence regarding the effects of the oral health of pre- and post-natal women, particularly disadvantaged or marginalised women, on the oral health of their children. The review includes a survey of the literature on the aetiology of ECC, a review of New Zealand epidemiological data in relation to international data, a review of the current evidence on the impact of maternal oral health on child oral health and a review of the effectiveness of current and potential maternal health and oral health interventions in improving infant oral health outcomes through reducing ECC. It concludes with a summary of the findings and evidence-based recommended options for the Ministry to explore further. The review noted that at age five, Māori and Pacific children have more dental caries, and are less likely to be caries free than other children. The review found that there was no very strong evidence that the oral health of mothers is related to the oral health of their infants, but the available evidence was relatively consistent in indicating that a relationship existed. (A common weakness of the studies reviewed was that they examined only the infants' oral health, assessing the mothers' oral health by self-report.) There was moderate evidence for the benefits of primary prevention programs which aim to reduce dental caries in children by improving the oral health of mothers.

Azarpazhooh A, Main PA. 2009. **Efficacy of dental prophylaxis (rubber cup) for the prevention of caries and gingivitis: a systematic review of literature.** British Dental Journal, 207(7), E14; discussion 328–9

Dental prophylaxis typically involves placing pumice or an abrasive paste in a rubber cup and applying the paste to the teeth using a rotating rubber cup at low speed. The purpose of this review was to assess the efficacy of routine dental prophylaxis before professionally applied topical fluoride (PATF) or at regular recall visits for the prevention of caries or gingivitis. The review authors identified only six original studies meeting their inclusion criteria. Four studies all demonstrated that dental prophylaxis is not warranted before PATF for caries prevention in children. Two other studies failed to provide evidence of any benefit of dental prophylaxis at recall examination for gingivitis prevention. The review authors concluded that the clinical implication of their findings was that dental prophylaxis need not be provided at either recall visits or before PATF for the prevention of caries in children and that dental prophylaxis at intervals of four months or more is not warranted for the prevention of gingivitis in the general population.

Recent cochrane reviews

The Cochrane collection contains 40 reviews relating to the prevention and management of dental caries. Links to the more recent reviews relating to prevention of dental caries in children, with a very brief summary of the main message of each review are presented below.

[Antibacterial agents in composite restorations for the prevention of dental caries](#) (2013)

No RCTs were identified, therefore no evidence was found to support the use of antibacterial agents in fillings.

[Fluorides for the prevention of early tooth decay \(demineralised white lesions\) during fixed brace treatment](#) (2013)

[Three relevant studies \(458 participants\) were identified. Based on the findings of one study, there is some “moderate” evidence that](#) fluoride varnish applied every six weeks (at the time of orthodontic review during treatment) is effective.

[Fluoride varnishes for preventing dental caries in children and adolescents](#) (2013)

There is a large body of moderate quality evidence (22 trials with 12,455 participants, 9595 of whom had their data used in the review’s analyses) indicating that fluoride varnish has a substantial caries-inhibiting effect in both primary and permanent teeth.

[Interdental brushing for the prevention and control of periodontal diseases and dental caries in adults](#) (2013)

Seven studies (354 participants analysed) were included in this review. There was very low-quality evidence from one study that toothbrushing plus interdental brushing led to reduced gingivitis and plaque at one month compared to toothbrushing alone. There was also low-quality evidence from seven studies that, at one month only, interdental brushing reduced gingivitis more than flossing. There was not enough evidence to determine whether interdental brushing reduced or increased plaque levels compared to flossing.

[Primary school-based behavioural interventions for preventing caries](#) (2013)

This review included four RCTs (2302 children) of interventions aimed at changing behaviour relating to toothbrushing and the consumption of cariogenic foods. The review authors found insufficient evidence that the interventions are efficacious at reducing caries but some limited evidence that they may improve plaque outcomes and increase children’s oral health knowledge.

[Sealants for preventing dental decay in the permanent teeth](#) (2013)

There were 34 RCTs in children aged 5–16 years, 12 (2575 participants) comparing sealant to no sealant, and 21 (3202) comparing one sealant with another. The review authors conclude that sealing the occlusal surfaces of children’s permanent molars reduces caries

[One-to-one dietary interventions undertaken in a dental setting to change dietary behaviour](#) (2012)

Five relevant RCTs were found. Only one, the largest study with 497 11–12 year olds, involved children. The review authors conclude that there was some evidence that these interventions can change behaviour although the evidence was stronger for interventions aimed at increasing fruit and vegetable consumption and decreasing alcohol consumption than for those aiming to reduce dietary sugar consumption.

[Fluoride supplements \(tablets, drops, lozenges or chewing gums\) for preventing dental caries in children](#) (2011)

There was moderate quality evidence that fluoride supplements reduce caries increment on permanent tooth surfaces (3 RCTs, 1240 participants, relative effect 0.24, 95% CI 0.16–0.33) and in permanent teeth (3 RCTs, 1208 participants, relative effect 0.29, 95% CI 0.19–0.39). The evidence regarding the effects of supplements on deciduous teeth and on fluorosis (an adverse effect) was unclear. Moderate quality evidence indicated no difference between the effects of topical fluoride and fluoride supplements in either permanent teeth (5 studies, 2047 participants) or deciduous teeth (2 studies, 1051 participants).

Older Cochrane review relating to prevention can be found here:

<http://www.thecochranelibrary.com/details/browseReviews/577889/Prevention.html> and reviews relating to treatment can be found here: <http://www.thecochranelibrary.com/details/browseReviews/577887/Treatment.html>

Websites and other relevant publications

American Academy of Pediatric Dentistry. **2013–14 Definitions, Oral Health Policies, and Clinical Guidelines.**
<http://www.aapd.org/policies/> accessed April 2014.

This website provides links to the many clinical guidelines of the American Academy of Pediatric Dentistry (AAPD), and also links to the AAPD's oral health policies, endorsements, and other resources.

Harris JC, Balmer RC, Sidebotham PD. 2009. **British Society of Paediatric Dentistry: a policy document on dental neglect in children.** Int J Paediatr Dent. DOI: 10.1111/j.1365-263X.2009.00996.x

Dental neglect can be defined as the persistent failure to meet a child's basic oral health needs, likely to result in serious impairment of a child's oral or general health or development. This policy document from the British Society of Paediatric Dentistry provides guidance on this issue.

Note: The publications listed were identified using the search methodology outlined in **Appendix 1**

SUBSTANCE USE



SMOKING IN PREGNANCY

Introduction

Smoking in pregnancy is widely regarded as the most important modifiable risk factor for poor pregnancy outcomes [197]. It is associated with an increased risk of anaemia, pre-term birth, placental abruption, placenta praevia, chronic hypertension, low birth weight, restricted growth in utero and fetal and neonatal death [197,330,331]. Research has suggested that children whose mothers smoked in pregnancy have higher rates of conduct disorders [332] and attention deficit hyperactivity disorder [333]. However, it is uncertain as to what extent smoking, as opposed to inherited personality traits or other social or environmental factors, is responsible for this [334].

The 2012/13 New Zealand Health Survey indicated that overall, 16% of women were smoking. However, this proportion was higher among women in the age groups where pregnancy most often occurs with 19% of 15–24 year olds and 21% of 25–34 year olds identified as smoking. The prevalence of smoking among Māori women (42%) was three times higher than among non-Māori women. After adjustment for age, sex and ethnic group, women in the the most deprived neighbourhoods had smoking rates over three times those in the least deprived neighbourhoods [335].

The longitudinal study “Growing Up in New Zealand” (GUiNZ) recruited around 7,000 pregnant women from the Auckland, Counties-Manukau and Waikato DHB regions who were expected to deliver in a 12 month period during 2009–2010. Nearly 11% of the women in this study were smoking an average of eight cigarettes per day during their pregnancy. Smoking in pregnancy was more common in women living in deprived areas and among women with lower levels of education. More than one in three Māori women, one in six Pacific women, and one in twelve European women in the study smoked during pregnancy. However, for Māori and Pacific women, the proportion smoking during pregnancy was lower than proportion smoking before pregnancy [336].

Barriers to smoking cessation among pregnant Māori women has been examined and found to include living with at least one other smoker, socialising mainly with other smokers, using smoking to cope with stress, and having a poor understanding of the risks associated with smoking in pregnancy. The involvement of the whole whānau in interventions to promote smokefree pregnancies has been identified as being important [337,338].

In New Zealand, the Ministry of Health’s target “Better help for smokers to quit” includes “progress towards 90 percent of pregnant women (who identify as smokers at the time of confirmation of pregnancy in general practice or booking with Lead Maternity Carer)” being offered advice and support to quit [339].

The following section uses data from the National Maternity Collection to examine smoking status during and after pregnancy among women who were registered with a lead maternity carer.

Data Sources and Methods

Indicator

1. *Proportion of babies born to mothers not registered with a lead maternity carer (LMC) at the time of delivery*

Numerator: Number of babies born to mothers who were not registered with a LMC at the time of delivery

Denominator: Number of babies born

2. *Proportion of babies born to mothers who smoked at first registration with a LMC and/or at two weeks post-delivery*

Numerator: Number of babies born to mothers who smoked at first registration with a LMC and/or at two weeks post-delivery

Denominator: Number of babies born to mothers who were registered with a LMC at the time of delivery



3. Number of cigarettes smoked at first registration with a LMC and at two weeks post-delivery, by the mothers of newborn babies

Numerator: Number of cigarettes smoked per day at first registration with a LMC and at two weeks post-delivery by the mothers of newborn babies

Denominator: Number of babies born to mothers who were registered with a LMC at the time of delivery and smoked at first registration with a LMC and at two weeks post-delivery

Data source

National Maternity Collection

Notes on Interpretation

Note 1: The National Maternity Collection (MAT) contains information on selected publicly funded maternity services from nine months before to three months after a birth. It integrates information from two data sources: LMC claims for payment for Primary Maternity Services provided under Section 88 of the NZ Public Health and Disability Act 2000; and birth event data from the National Minimum Dataset (NMDS) on hospital admissions (delivery event for the mother and the postnatal period for baby). A limitation of this source is its integration of two data sources. Since different information may be collected in each set, multiple records may exist for the same baby.

Up until June 2007, Section 88 claims data coverage was 95% of known births. However, in July 2007, due to a funding change, DHB-employed midwifery teams ceased to submit claims to the Ministry of Health for their services. Thus no LMC registration data (including smoking status) is currently available in MAT for women who opt for DHB-based primary maternity care. In this dataset it is difficult to distinguish between those who were not registered with a LMC at the time of delivery because they accessed their primary maternity care through DHB services, and those who received no antenatal care at all.

Note 2: Smoking status is self-reported by the mother to the LMC at two points: first registration with the LMC and two weeks post-delivery (postnatal). It is important to note that a woman can be registered with a LMC at any stage throughout the pregnancy, including at delivery.

Note 3: Smoking status was derived based on the provision of either a 'Y' for smoking status or a count of the number of cigarettes smoked at first registration and/or at two weeks postnatal.

Babies born to Mothers Not Registered with a LMC at Delivery

New Zealand Distribution

In New Zealand during 2008–2012, 15.1% of babies were born to mothers who were not registered with a LMC at the time of delivery. However, many of these babies' mothers may have accessed hospital-based maternity services, making it difficult to estimate the proportion who received no antenatal care at all during pregnancy (**Table 43**).

Table 43. Status of maternal registration with a Lead Maternity Carer at the time of delivery for New Zealand babies born 2008–2012

Maternal LMC registration status at delivery	Number of babies: total 2008–2012	Number of babies: annual average	Percent of babies
New Zealand			
Registered with a LMC	268,309	53,662	84.7
Not registered with a LMC	47,926	9,585	15.1
LMC registration status not known	644	129	0.2
Total	316,879	63,376	100

Source: National Maternity Collection

New Zealand Distribution by Maternal Age, Ethnicity, and NZDep decile

In New Zealand during 2008–2012, Pacific, Asian/Indian, and Māori babies (vs European babies) had a *significantly higher* proportion of mothers who were not registered with a LMC at delivery, as were the babies of younger mothers (less than 25 years vs. 25 or more years). A *significantly higher* proportion of babies from average to more deprived areas (NZDep deciles 3–10 vs. deciles 1–2) also had mothers who were not registered with a LMC at delivery (**Table 44**).



Table 44. Babies born to mothers not registered with a Lead Maternity Carer at delivery by maternal age, ethnicity, and NZDep Index decile, New Zealand 2008–2012

Variable	No. of babies: total 2008–2012			Mother not registered with LMC		
	Mother not registered with LMC	Mother registered with LMC	Total	Rate per 100 babies	Rate ratio	95% CI
Maternal age						
<20 years	4,394	17,966	22,396	19.6	1.30	1.26–1.34
20–24 years	10,415	48,040	58,537	17.8	1.18	1.15–1.21
25–29 years	11,913	66,890	78,977	15.1	1.00	
30–34 years	11,163	76,779	88,143	12.7	0.84	0.82–0.86
35+ years	10,031	58,627	68,809	14.6	0.97	0.94–0.99
Baby's ethnicity						
Māori	12,406	71,798	84,309	14.7	1.66	1.63–1.70
Pacific	13,343	21,878	35,245	37.9	4.28	4.19–4.37
Asian/Indian	7,218	27,937	35,213	20.5	2.32	2.26–2.38
European/Other	14,209	146,011	160,675	8.8	1.00	
Maternal NZ Deprivation Index decile						
Deciles 1–2	3,663	40,494	44,256	8.3	1.00	
Deciles 3–4	4,436	42,821	47,413	9.4	1.13	1.08–1.18
Deciles 5–6	6,395	52,388	58,942	10.8	1.31	1.26–1.36
Deciles 7–8	9,785	64,163	74,103	13.2	1.60	1.54–1.65
Deciles 9–10	21,811	67,315	89,198	24.5	2.95	2.86–3.05

Source: National Maternity Collection; Note: Ethnicity is Level 1 prioritised; Decile is NZDep06

Northern DHBs Distribution

During 2008–2012, 20.5% of Northland, 12.6% of Waitemata, 25.5% of Auckland, and 36.5% of Counties Manukau babies had a mother who was not registered with a LMC at delivery. Rates were *significantly higher* than the New Zealand rate for Northland, Auckland, and Counties Manukau, while *significantly lower* in Waitemata (**Table 45**). However, many of these babies' mothers may have accessed hospital-based maternity services, making it difficult to estimate the proportion who received no antenatal care at all during pregnancy.

Table 45. Status of maternal registration with a Lead Maternity Carer at the time of delivery for babies born, Northern DHBs vs. New Zealand 2008–2012

DHB	No. of babies: total 2008–2012			Mother not registered: rate per 100 babies	Rate ratio	95% CI
	Mother not registered with LMC	Mother registered with LMC	Total			
Northland	2,340	9,075	11,419	20.5	1.35	1.31–1.41
Waitemata	4,947	34,215	39,367	12.6	0.83	0.81–0.85
Auckland	8,424	24,630	33,089	25.5	1.68	1.65–1.72
Counties Manukau	15,496	26,944	42,454	36.5	2.41	2.38–2.45
New Zealand	47,926	268,309	316,879	15.1	1.00	

Source: National Maternity Collection



Maternal smoking

New Zealand Distribution by Maternal Smoking Status

In New Zealand during 2008–2012, of the babies with mothers registered with a LMC at delivery, 79.1% had a non-smoking mother, and 17.3% had a mother who indicated having smoked at some stage during pregnancy and/or at two weeks post-delivery. Mothers who were smoking at first registration and at two weeks post-delivery accounted for 12.8% of the babies with mothers registered with a LMC at delivery (**Table 46**). The proportion of mothers who were non-smokers has increased marginally from 77.7% in 2008 to 79.8% in 2012 (**Figure 141**).

Table 46. Babies born to mothers registered with a Lead Maternity Carer at delivery, by maternal smoking status, New Zealand 2008–2012

Maternal smoking status at:		Number: total 2008–2012	Number: annual average	Percent
first registration with LMC	two weeks postnatal			
Babies with mother registered with a LMC at delivery in New Zealand				
Non-smoker	Non-smoker	212,160	42,432	79.1
	Smoker	3,011	602	1.1
	Not known	9,717	1,943	3.6
Smoker	Non-smoker	6,218	1,244	2.3
	Smoker	34,294	6,859	12.8
	Not known	2,841	568	1.1
Not known	Non-smoker	37	7	0.0
	Smoker	7	1	0.0
	Not known	24	5	0.0
Total		268,309	53,662	100.0

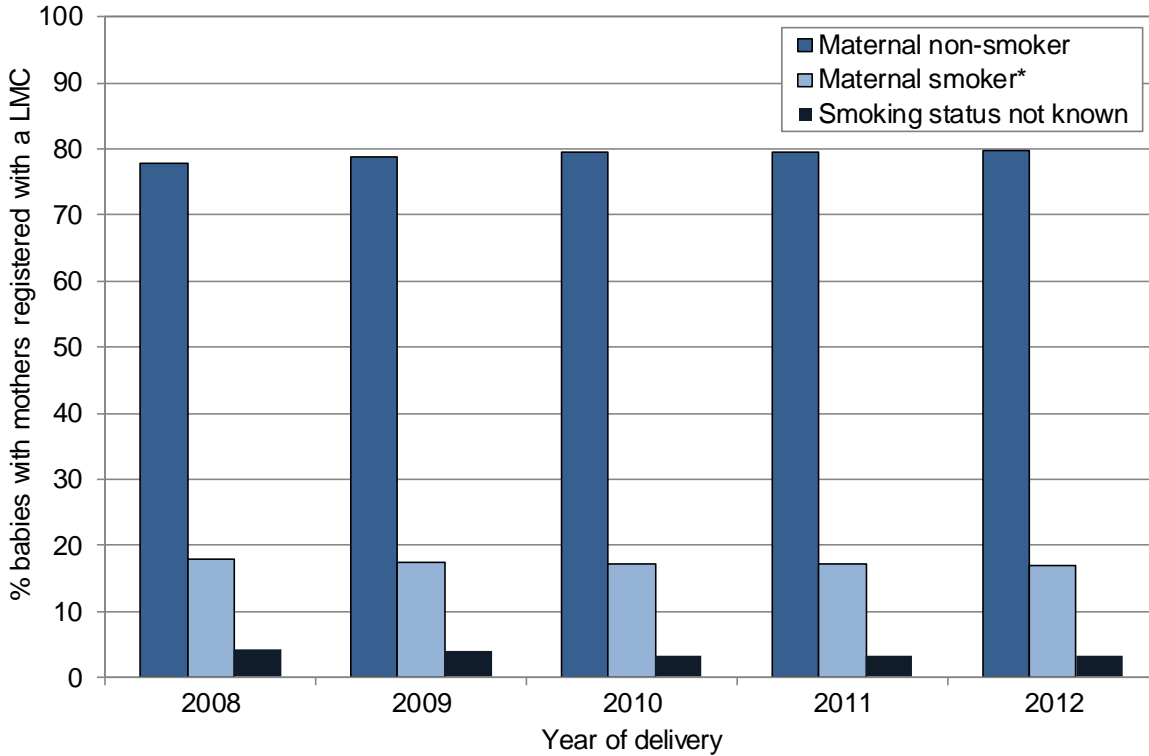
Source: National Maternity Collection; Note: Information is for babies born to mothers registered with a LMC at delivery; Smoker is defined as a mother who indicated 'Y' to smoking or stated the number of cigarettes

New Zealand Distribution by Maternal Age

In New Zealand during 2008–2012, while the majority of babies had non-smoking mothers, the rate of teenage mothers that smoked was notable (**Figure 142**).

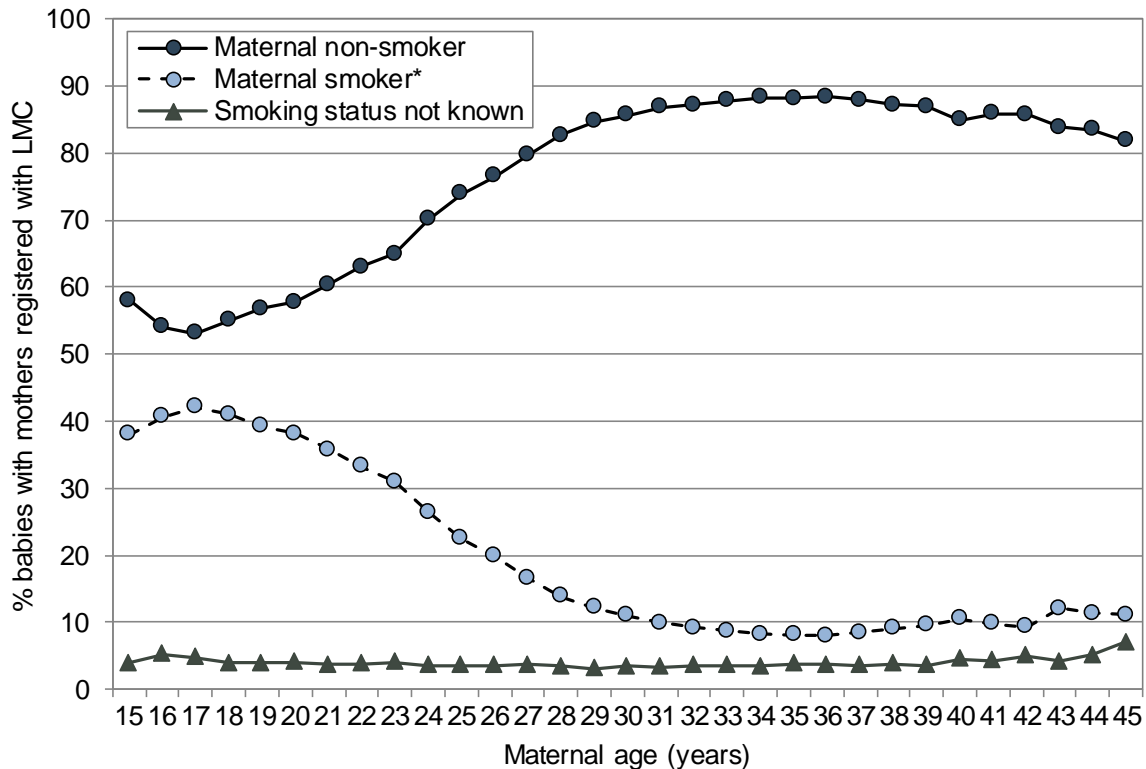


Figure 141. Percentage of babies born to mothers registered with a Lead Maternity Carer at delivery, by maternal smoking status and year, New Zealand 2008–2012



Source: National Maternity Collection; Note: Information is for babies born to mothers registered with a LMC at delivery; * Smokers are mothers smoking at first LMC registration and/or at two weeks postnatal for that baby

Figure 142. Percentage of babies born to mothers registered with a Lead Maternity Carer at delivery, by maternal smoking status and age, New Zealand 2008–2012



Source: National Maternity Collection; Note: Information is for babies born to mothers registered with a LMC at delivery; * Smokers are mothers smoking at first LMC registration and/or at two weeks postnatal for that baby



New Zealand Distribution by Maternal Age, Ethnicity, and NZDep decile

In New Zealand during 2008–2012, Māori and Pacific babies (vs European/Other babies), and the babies of younger mothers (less than 25 years vs. 25 or more years), had a *significantly higher* rate of mothers who smoked. A *significantly higher* proportion of babies from average to more deprived areas (NZDep06 deciles 3–10 vs. deciles 1–2) also had mothers who smoked (**Table 47, Figure 143**).

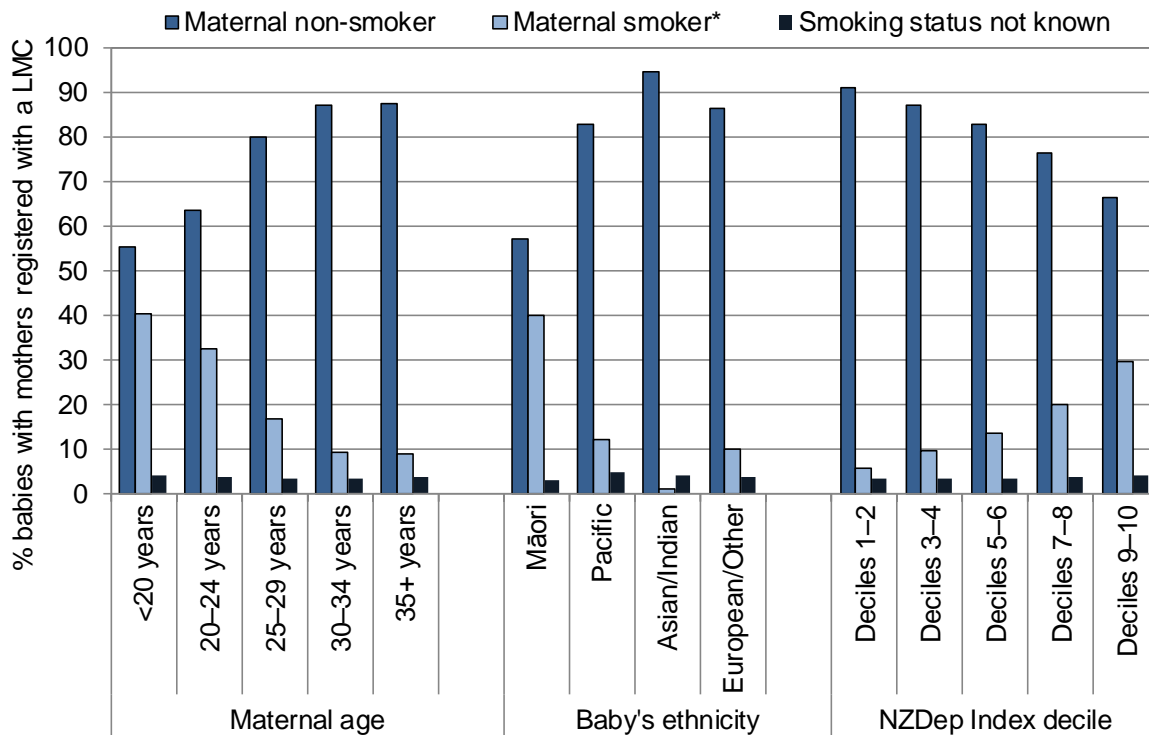
Table 47. Babies born to a mother registered with a LMC at delivery, by smoking status, maternal age, baby's ethnicity, and NZ Deprivation Index decile, New Zealand 2008–2012

Variable	Rate	Rate ratio	95% CI	Rate	Rate ratio	95% CI
	Maternal non-smoker			Maternal smoker		
Maternal age						
<20 years	55.5	0.69	0.68–0.70	40.3	2.43	2.37–2.49
20–24 years	63.6	0.80	0.79–0.80	32.6	1.96	1.92–2.00
25–29 years	79.9	1.00		16.6	1.00	
30–34 years	87.2	1.09	1.09–1.10	9.4	0.57	0.55–0.58
35+ years	87.4	1.09	1.09–1.10	8.8	0.53	0.51–0.54
Baby's prioritised ethnicity						
Māori	56.9	0.66	0.65–0.66	40.1	4.04	3.97–4.11
Pacific	82.9	0.96	0.95–0.96	12.2	1.23	1.18–1.28
Asian/Indian	94.7	1.09	1.09–1.10	1.1	0.11	0.10–0.12
European/Other	86.5	1.00		9.9	1.00	
NZ Deprivation Index decile						
Deciles 1–2	91.0	1.00		5.7	1.00	
Deciles 3–4	87.1	0.96	0.95–0.96	9.6	1.67	1.59–1.76
Deciles 5–6	82.9	0.91	0.91–0.92	13.7	2.40	2.29–2.51
Deciles 7–8	76.5	0.84	0.84–0.85	19.8	3.47	3.33–3.62
Deciles 9–10	66.5	0.73	0.73–0.74	29.5	5.16	4.95–5.38

Source: National Maternity Collection; Note: Rate is per 100 babies born to mothers registered with a LMC at delivery; Maternal smoker are mothers who were smoking at first LMC registration and/or at two weeks postnatal for that baby; Ethnicity is Level 1 prioritised; Decile is NZDep06



Figure 143. Percentage of babies born to mothers registered with a Lead Maternity Carer at delivery, by maternal smoking status, maternal age, baby's ethnicity, and NZ Deprivation Index deciles, New Zealand 2008–2012



Source: National Maternity Collection; Note: Information is for babies born to mothers registered with a LMC at delivery; * Smokers are mothers smoking at first LMC registration and/or at two weeks postnatal for that baby; Ethnicity is Level 1 prioritised; Decile is NZDep06

New Zealand Distribution by Cigarettes Smoked

In New Zealand during 2008–2012, 12.8% of babies ($n=34,294$) had mothers who reported smoked at first registration with a LMC and also at two weeks post-delivery (**Table 46**). Of these babies, 90.4% had mothers who reported smoked the same number of cigarettes per day at first registration and at two weeks post-delivery (57.7% smoked fewer than 10 cigarettes per day, 28.8% smoked 10–20, and 3.9% smoked more than 20; **Table 48**).

The proportion of babies with mothers who had decreased the number of cigarettes smoked daily was 1.0% decreased from more than 20, and 4.9% decreased from 10–20 cigarettes, however, 3.1% increased from fewer than 10 cigarettes at first registration to 10 or more at two weeks post-delivery (**Table 48**).

Table 48. Number of cigarettes smoked daily at first registration with a Lead Maternity Carer and at two weeks post-delivery, by the mothers of babies born in New Zealand 2008–2012

		No.	%	No.	%	No.	%	No.	%
Babies with mothers registered with a LMC at delivery									
New Zealand									
Number of cigarettes smoked daily		At two weeks post-delivery							
		<10		10–20		>20		Total	
At first LMC registration	<10	19,775	57.7	975	2.8	98	0.3	20,848	60.8
	10–20	1,683	4.9	9,880	28.8	204	0.6	11,772*	34.3
	>20	136	0.4	191	0.6	1,347	3.9	1,674	4.9
	Total	21,594	63.0	11,046	32.2	1,649	4.8	34,294	100.0

Source: National Maternity Collection; Note: Information is for those registered with a LMC only; * Total includes 5 babies with a post-delivery maternal smoking status of "Y" but an incomplete number of cigarettes



Northern DHBs Distribution

Northern DHBs vs. New Zealand

During 2008–2012, 28.0% of Northland, 9.8% of Waitemata, 5.5% of Auckland, and 16.7% of Counties Manukau babies had a mother who smoked, with maternal smoking rates (smoking at first registration and/or at two weeks post-delivery) in Northland being *significantly higher* than the New Zealand rate (amongst babies with mothers registered with a LMC at delivery). In the Waitemata, and Auckland DHBs, rates were *significantly lower* than the New Zealand rate (**Table 49**).

Table 49. Babies born to mothers registered with a Lead Maternity Carer at delivery, by maternal smoking status, Northern DHBs vs. New Zealand 2008–2012

DHB	Number of babies: total 2008–2012			Babies with maternal smoker: rate per 100 babies	Rate ratio	95% CI
	Maternal smoker	Maternal non-smoker	Total			
Babies with mothers registered with a LMC at delivery						
Northland	2,540	6,053	9,075	28.0	1.62	1.57–1.68
Waitemata	3,337	29,680	34,215	9.8	0.56	0.55–0.58
Auckland	1,349	22,227	24,630	5.5	0.32	0.30–0.33
Counties Manukau	4,506	21,267	26,944	16.7	0.97	0.94–1.00
New Zealand	46,371	212,160	268,309	17.3	1.00	

Source: National Maternity Collection; Note: Information is for babies born to mothers registered with a LMC at delivery; * Maternal smokers are mothers smoking at first LMC registration and/or at two weeks postnatal for that baby

Changes in Smoking Status

In all four of the Northern DHBs during 2008–2012, of the mothers who were identified as smoking at either first LMC registration or at two weeks postnatally, the majority were smoking at both time points. A smaller proportion were smoking at first LMC registration but not postnatally, with an even smaller proportion smoking at two weeks postnatally but not at first LMC registration (**Table 50**).

Northern DHBs Distribution by Ethnicity

In the Waitemata, Auckland, and Counties Manukau DHBs during 2008–2012, maternal smoking rates were higher for Māori > Pacific > European/Other > Asian/Indian babies. Similarly in Northland, maternal smoking rates were higher for Māori than for European/Other babies (**Figure 144**).



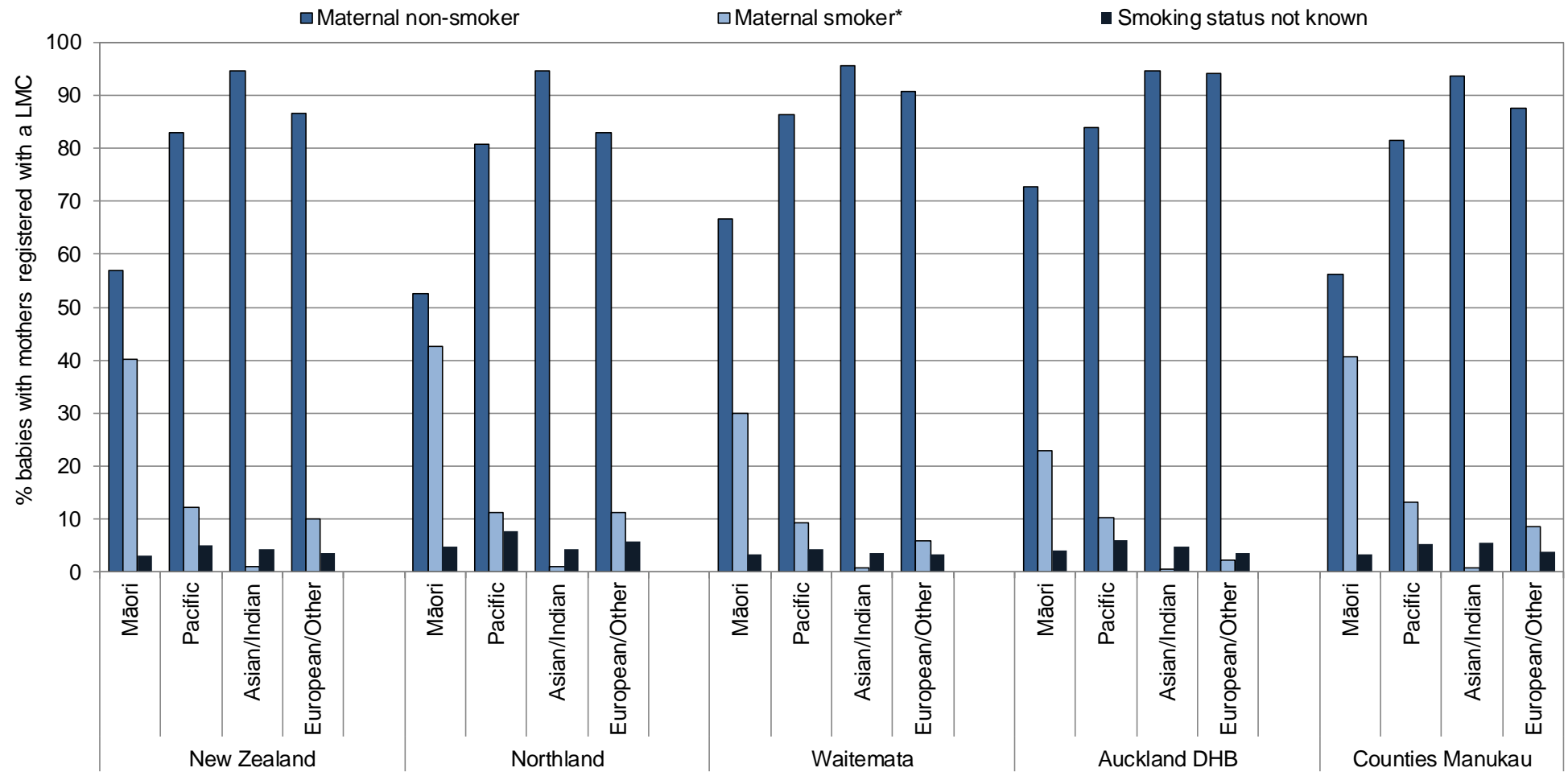
Table 50. Babies born to mothers registered with a Lead Maternity Carer at delivery, by maternal smoking status, Northern DHBs 2008–2012

Maternal smoking status		Babies with mother registered with a LMC at delivery		
first registration with LMC	two weeks postnatal	Number: total 2008–2012	Number: annual average	Percent
Northland				
Non-smoker	Non-smoker	6,053	1,211	66.7
	Smoker	123	25	1.4
	Not known	480	96	5.3
Smoker	Non-smoker	135	27	1.5
	Smoker	2,039	408	22.5
	Not known	243	49	2.7
Not known	Non-smoker	<3	s	s
	Smoker	0	0	0.0
	Not known	0	0	0.0
Total		9,075	1,815	100.0
Waitemata				
Non-smoker	Non-smoker	29,680	5,936	86.7
	Smoker	192	38	0.6
	Not known	1,192	238	3.5
Smoker	Non-smoker	520	104	1.5
	Smoker	2,415	483	7.1
	Not known	210	42	0.6
Not known	Non-smoker	<3	s	s
	Smoker	0	0	0.0
	Not known	4	1	0.0
Total		34,215	6,843	100.0
Auckland DHB				
Non-smoker	Non-smoker	22,227	4,445	90.2
	Smoker	94	19	0.4
	Not known	1,050	210	4.3
Smoker	Non-smoker	205	41	0.8
	Smoker	924	185	3.8
	Not known	125	25	0.5
Not known	Non-smoker	4	1	0.0
	Smoker	<3	s	s
	Not known	0	0	0.0
Total		24,630	4,926	100.0
Counties Manukau				
Non-smoker	Non-smoker	21,267	4,253	78.9
	Smoker	188	38	0.7
	Not known	1,155	231	4.3
Smoker	Non-smoker	721	144	2.7
	Smoker	3,182	636	11.8
	Not known	415	83	1.5
Not known	Non-smoker	3	1	0.0
	Smoker	0	0	0.0
	Not known	13	3	0.0
Total		26,944	5,389	100.0

Source: National Maternity Collection. Note: s: suppressed due to small numbers



Figure 144. Percentage of babies born to mothers registered with a Lead Maternity Carer at delivery, by maternal smoking status and baby's ethnicity, Northern DHBs vs. New Zealand 2008–2012



Source: National Maternity Collection; Note: * Maternal smokers are mothers smoking at first LMC registration and/or at two weeks postnatal for that baby; Ethnicity is Level 1 prioritised

Distribution by Number of Cigarettes Smoked

In all four of the Northern DHBs during 2008–2012, the majority of babies whose mothers smoked, had mothers who smoked <10 cigarettes a day. However, a smaller proportion smoked 10–20 or >20 cigarettes a day, with a small number of women changing how many cigarettes they smoked between first LMC registration and two week postnatally (**Table 51**).

Table 51. Number of cigarettes smoked daily at first registration with a Lead Maternity Carer and at two weeks post-delivery, by the mothers of babies born in the Northern DHBs 2008–2012

		No.	%	No.	%	No.	%	No.	%
Babies with mothers registered with a LMC at delivery									
Number of cigarettes smoked daily		At two weeks post-delivery							
		<10		10–20		>20		Total	
Northland									
At first LMC registration	<10	1,176	57.7	39	1.9	9	0.4	1,224	60.0
	10–20	69	3.4	620	30.4	4	0.2	693	34.0
	>20	7	0.3	14	0.7	101	5.0	122	6.0
	Total	1,252	61.4	673	33.0	114	5.6	2,039	100.0
Waitemata									
At first LMC registration	<10	1,588	65.8	54	2.2	3	0.1	1,645	68.1
	10–20	98	4.1	574	23.8	8	0.3	680	28.2
	>20	7	0.3	7	0.3	75	3.1	89	3.7
	Total	1,693	70.1	635	26.3	86	3.6	2,414	100.0
Auckland DHB									
At first LMC registration	<10	689	74.6	17	1.8	<3	s	707	76.5
	10–20	17	1.8	168	18.2	4	0.4	189	20.5
	>20	3	0.3	4	0.4	21	2.3	28	3.0
	Total	709	76.7	189	20.5	26	2.8	924	100.0
Counties Manukau									
At first LMC registration	<10	2,059	64.7	49	1.5	4	0.1	2,112	66.4
	10–20	96	3.0	866	27.2	12	0.4	974	30.6
	>20	8	0.3	4	0.1	84	2.6	96	3.0
	Total	2,163	68.0	919	28.9	100	3.1	3,182	100.0

Source: National Maternity Collection; Note: Information is for those registered with a LMC only; s: suppressed due to small numbers.

Local Policy Documents and Evidence Based Reviews Relevant to the Cessation of Smoking in Pregnancy

Table 52 (below) provides a brief overview of local policy documents and evidence based reviews which consider interventions to promote smoking cessation during pregnancy. Given that smoking during pregnancy has been shown to be highest amongst younger mothers, **Table 58** (page 318) and **Table 59** (page 323) provide an overview of publications on smoking prevention and cessation in young people are relevant.

Table 52. Local policy documents and evidence based reviews relevant to the cessation of smoking in pregnancy

Ministry of Health publications
<p>Ministry of Health. 2007. New Zealand Smoking Cessation Guidelines. Wellington: Ministry of Health. http://www.health.govt.nz/publication/new-zealand-smoking-cessation-guidelines</p> <p>These guidelines identify pregnant and breastfeeding women as priority population groups for cessation throughout pregnancy and the post-partum period. While recognising that there is limited evidence for the effectiveness of nicotine replacement therapy (NRT) in pregnancy, following analysis of the risks and benefits known at the time, the guidelines support the use of NRT in pregnancy and breastfeeding.</p>
International guidelines
<p>National Institute for Health and Care Excellence. 2013. Smoking cessation in secondary care: acute, maternity and mental health services. London: National Institute for Health and Care Excellence. http://www.nice.org.uk/nicemedia/live/14306/65863/65863.pdf</p> <p>The purpose of this guidance is to support smoking cessation, temporary abstinence and smokefree policies in all secondary care settings, including maternity services. The supporting evidence relevant to smoking in pregnant women and new mothers is Review 3: 'Smoking cessation interventions in acute and maternity services: review of barriers and facilitators' was carried out by Tobacco Dependence Research Unit, Queen Mary University of London by Katie Myers, Hayden McRobbie, Oliver West and Peter Hajek.</p>
<p>National Institute for Health and Care Excellence. 2010. Quitting smoking in pregnancy and following childbirth. London: National Institute for Health and Care Excellence. http://www.nice.org.uk/nicemedia/live/13023/49345/49345.pdf</p> <p>This guidance is intended for service commissioners, managers and health professionals who have an interest in, and responsibility for, helping pregnant smokers and new mothers to quit. The first chapter of the guidance includes recommendations on identifying women who smoke and referring them to stop smoking services, contacting and supporting women who have been referred, nicotine replacement therapy and other pharmacological interventions, meeting the needs of disadvantaged women who smoke, helping women's partners and "significant others" who smoke and training for professionals. Subsequent chapters cover public health need and practice, considerations, implementation, and recommendations for research. The appendix provides brief evidence statements from the three reviews and three expert reports on which the guidance was based. These publications can be found on the NICE website here: http://guidance.nice.org.uk/PH26/SupportingEvidence or here: https://beta.nice.org.uk/Guidance/PH26/Documents#resource_Review_Documents (under the heading "Quitting smoking in pregnancy and following childbirth: final evidence reviews").</p> <p>While there was good evidence to support smoking cessation interventions (including financial incentives and self-help), there was a lack of evidence on how to prevent relapse after giving birth and limited evidence of the effectiveness of interventions to help partners to quit or establish smoke-free homes.</p>
Evidence-based medicine reviews
<p>Likis F E, Andrews J C, Fonnesebeck C J, et al. 2014. Smoking Cessation Interventions in Pregnancy and Postpartum Care. Evidence Report/Technology Assessment No.214. (Prepared by the Vanderbilt Evidence-based Practice Center under Contract No. 290-2007-10065-I.) AHRQ Publication No. 14-E001-EF. Rockville, MD: Agency for Healthcare Research and Quality. http://effectivehealthcare.ahrq.gov/ehc/products/517/1871/smoking-pregnancy-infants-report-140226.pdf</p> <p>This systematic review included 59 unique studies. Three were prospective cohort studies and 56 were RCTs. The review authors considered that 13 of the RCTs were good, 15 fair and 28 poor quality. The studies evaluated educational materials, counselling-based interventions, peer support, nicotine replacement therapy (NRT), multi component interventions, and other unique interventions. Overall, the reviewers considered that the strength of evidence regarding interventions for smoking cessation and relapse prevention in pregnant women was low. When assessed by meta-analysis, the strength of evidence was moderate for the effectiveness of incentives (odds ratio 3.23, 95% CI 1.98–4.59) and low for all other intervention components (odds ratios ranged from 1.32 down to 1.05 and all the associated confidence intervals all included 1, the value associated with no effect. The evidence for counselling was not assessed by meta-analysis as in most studies both the intervention and control arms included counselling (so it was not possible to compare counselling vs. no counselling). The reviewers found insufficient evidence to determine the effect of smoking cessation interventions on gestational age, birth weight, neonatal deaths, or long term or child outcomes, or to assess the harms of smoking interventions. They stated that their review indicated that approaches combining multiple components are most likely to be successful and that incentives were the component with the highest probability of success. Other components with a high probability of success were information, quit guides, feedback about biologic measures, NRT and personal follow up. The components that added little to the success of multi-component interventions were peer support, clinic reinforcement and prescriptions to quit.</p>

Chamberlain C, O'Mara-Eves A, Oliver S, et al. 2013. **Psychosocial interventions for supporting women to stop smoking in pregnancy.** Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD001055.pub4 <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001055.pub4/abstract>

This comprehensive review included 86 trials (RCTs, cluster RCTs, randomised cross-over trials, and quasi-randomised trials), 77 of which (including 29,000+ women) provided data on smoking abstinence in late pregnancy. It includes the results of 88 different meta-analyses for a total of 11 comparisons involving 59 outcomes. Counselling appeared to have a modest effect on smoking cessation compared to usual care (27 trials; average risk ratio (RR) 1.44, 95% CI 1.19–1.75) but sub-group analysis indicated that the effect size was different from zero only where counselling was provided in conjunction with other strategies (11 studies; average RR 1.59, 95% CI 1.15–2.21, $I^2=45\%$) or tailored to the needs of individual women (six studies; average RR 1.49, 95% CI 1.01–2.20, $I^2=75\%$). It was unclear whether any one type of counselling was better than any other and for most secondary outcomes the effect of counselling was not significantly different from the null effect.

The largest effect size was for incentive-based interventions: compared to a less intensive intervention (one study; RR 3.64, 95% CI 1.84–7.23) and to an alternative intervention (one study; RR 4.05, 95% CI 1.48–11.11).

Feedback interventions involve the mother being provided with feedback such as information about fetal health status (e.g. from ultrasound monitoring) or the results of measurements of by-products of tobacco smoking such as carbon monoxide or urinary cotinine). Feedback interventions had a significant effect only when compared to usual care (rather than a less intensive intervention) and provided together with other strategies such as counselling (two studies; average RR 4.39, 95% CI 1.89–10.21).

The effect of health education was unclear both in comparison to usual care and to a less intensive intervention. Peer social support appeared effective (five studies; average RR 1.49, 95% CI 1.01–2.19), but the effect of social support by partners was unclear. When smoking interventions were provided as part of broader interventions to improve maternal health rather than as a stand-alone smoking cessation interventions, the effects were mixed.

Pooled data from 14 trials (of various interventions) indicated a significant reduction in low (<2500g) birthweight (average RR 0.82, 95% CI 0.71–0.94) and pooled data from 14 psychosocial intervention trials reporting on pre-term birth showed a significant reduction in pre-term births (average RR 0.82, 95% CI 0.70–0.96). Pooled data from 19 studies showed a statistically significant (but small) increase in birthweight in women who received smoking intervention (mean increase 40.78g, 95% CI 18.45–63.10g).

The review authors concluded that psychosocial interventions can increase the proportion of women who stop smoking in late pregnancy and reduce preterm birth and low birthweight.

Coleman T, Chamberlain C, Davey M-A, et al. 2012. **Pharmacological interventions for promoting smoking cessation during pregnancy.** Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD010078 <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD010078/abstract>

This review aimed to determine the efficacy and safety of smoking-cessation pharmacotherapy for supporting pregnant women to quit smoking. The review authors failed to find any trials of varenicline or bupropion but they found six RCTs of nicotine replacement therapy (NRT) including a total of 1745 pregnant women smokers. The trials were of generally high quality. They performed a pooled analysis of the data from all six trials which indicated that there was no statistically significant evidence that NRT was more effective than placebo/control: risk ratio 1.33, 95% CI 0.93–1.91, $T^2=0.05$, $I^2=28\%$. The review authors concluded that there was insufficient evidence to draw conclusions about the efficacy and safety of NRT added to behavioural support for quitting smoking during pregnancy but that there were statistically non-significant findings suggesting that further research with higher doses of NRT might provide more definitive evidence.

Filion KB, Abenham HA, Mottillo S, et al. 2011. **The effect of smoking cessation counselling in pregnant women: a meta-analysis of randomised controlled trials.** BJOG: An International Journal of Obstetrics & Gynaecology, 118(12), 1422–28.

The aim of this review was to assess the effect of counselling as a smoking cessation intervention for pregnant women in isolation rather than as part of a multi-component intervention. The review authors performed a meta-analysis of data from eight RCTs (3290 women) all of which examined abstinence at six months. The proportion of women who remained abstinent at six months ranges from 4 to 24% in those randomised to receive counselling and from 2 to 21% in the control women. The odds ratio was 1.08, (95% CI 0.84–1.40) indicating little evidence that counselling is efficacious in promoting abstinence. There was no evidence suggesting that efficacy was different for different types of counselling. The authors concluded that the available data was limited but that it was sufficient to rule out large treatment effects.

The CRD noted that there were limitations in the way this review was conducted but the conclusions reflected the evidence and were appropriately cautious. The CRD commentary can be found here:

http://www.crd.york.ac.uk/CRDWeb/ShowRecord.asp?AccessionNumber=12011006690&UserID=0#_U2hEt_mSx8E

Hemsing N, Greaves L, O'Leary R, et al. 2011. **Partner Support for Smoking Cessation During Pregnancy: A Systematic Review.** Nicotine & Tobacco Research. <http://ntr.oxfordjournals.org/content/early/2011/12/14/ntr.ntr278.abstract>

This review included nine intervention studies of a range of interventions. Five of the studies were RCTs, and the others used a variety of pre-post test designs. Of the four studies of interventions aimed at enhancing partner's support for women's smoking cessation, three found no effect but one RCT found a significant effect on smoking quit attempts in pregnant women. In this study the intervention for the women involved a booklet, a video and two 10-minute counselling sessions while the partners were given a booklet explaining the importance of quitting together for the baby's future health. The effect of partner support on the study results was unclear, however, because while 76.2% of the women

gave their partner the booklet, only 48.5% of the partners reported having read it. Seven out of the nine studies (2 RCTs, one cluster RCT and four pre-post test) found no effect of the intervention on partner smoking cessation (although three of them found significant increases in partner quit attempts) but two RCTs found a significant effect on partner smoking cessation. The two successful intervention involved multiple components. The review authors noted that because the interventions were dissimilar and often multi-component it was difficult to compare efficacy between interventions. They stated that while the available evidence did not support conclusive recommendations, it did suggest some promising intervention components: multiple points of contact, intervention delivered to partner by someone other than the pregnant woman herself, and tailoring to specific settings and populations (e.g. addressing the particular barriers for low-SES groups). They also stated that their review indicated that smoking cessation interventions are often not sustainable into the post-partum period.

Other relevant publications

Esdonk T, Glover M, Kira A, et al. 2013. **Reducing Smoking in Pregnancy Among Māori Women: “Aunties” Perceptions and Willingness to Help.** *Maternal and Child Health Journal*, 1–7. <http://dx.doi.org/10.1007/s10995-013-1377-8>

Māori women are often late engaging with the health system when they become pregnant, with 42% not registering with a lead maternity carer until after the first trimester of pregnancy. Māori community health workers (CHWs) or “aunties” may be able to provide smoking cessation support to pregnant Māori smokers. This paper reports on data collected during the developmental phase of the Auahi Kore Whakahaere Hapunga (facilitating smokefree pregnancy) Initiative study (AWHI) at three hui exploring the aunties’ (25 in total) opinions about how and why they could help newly-pregnant pregnant smokers. The findings confirmed those of previous research in demonstrating the strengths of CHWs: their familiarity with the local culture and environment and their extensive networking. Aunties who smoked themselves did not feel that it was appropriate for them to provide smoking cessation assistance as they felt that it was important for health advisors to “walk the talk”. An outcome of the hui has been the recruitment of ten aunties who will be involved in the on-going AWHI study to deliver the trial intervention to pregnant Māori smokers.

Ryan A. 2013. **Interventions to support smoking cessation in pregnancy: a systematic review of reviews.**

Perspective - NCT’s journal on preparing parents for birth and early parenthood (March 2013).

http://www.nct.org.uk/sites/default/files/related_documents/Ryan%20Interventions%20to%20support%20smoking%20cessation%20in%20pregnancy-%20a%20systematic%20review%20of%20reviews%20pp16%20-%20Mar13.pdf

This concise review offers an easy to read overview of the evidence (both systematic reviews and recent RCTs) regarding smoking cessation interventions, but it was published just too early to include the conclusions from the 2013 Cochrane review on psychosocial interventions.

Allen M, Barnes C, Dalley A. 2012. **Best Practice Framework for Dedicated Pregnancy Smoking Cessation Services: Report for the Ministry of Health.** Wellington: Allen & Clarke. <http://www.sfc.org.nz/documents/Best-Practice-Framework-2012.pdf>

The Ministry of Health commissioned Allen and Clarke to develop an evidence-based best practice framework for the delivery of smoking cessation services for pregnant women in New Zealand. Project team members reviewed the relevant literature from 2007–12, visited and conducted interviews with the six Ministry-funded dedicated pregnancy smoking cessation service providers and 13 other stakeholders to gather information on current New Zealand practice in pregnancy smoking cessation services, and met with a technical advisory group who provided expert advice. The report authors noted that many providers are still basing their practice on the “Stages of Change” model which is contrary to the approach recommended in the latest New Zealand Smoking Cessation guidelines. The best practice framework has three main components: components; philosophical and policy foundations, service delivery systems and coordination and linkages. Following the best practice framework are recommendations in three categories: those for those for structural/policy change (targeted at the Ministry of Health), those for practice and the sector, and those for information, analysis and research.

Glover M, Kira A. 2012. **Pregnant Māori Smokers’ Perception of Cessation Support and How It Can Be More Helpful.** *Journal of Smoking Cessation*, 7(02), 65–71. <http://dx.doi.org/10.1017/jsc.2012.13>

This paper reports on face-to-face interviews with 60 pregnant Māori women who were mostly smokers and who were purposely chosen to provide variety in age, stage of pregnancy, number of pregnancies, place of residence and socio-economic status. The women smoked an average of nine cigarettes per day, and most (83%) had been advised to stop, most commonly by the midwife (63%). Few (21%) felt influenced by the advice they had received. Factors that the women thought might help them to quit included more empathetic, accessible and proactive health provider support, resources which included details of the risks of smoking for the foetus, information about smoking cessation products and services, and mass media support specific to pregnancy (similar to the “It’s about whānau” campaign).

Canadian Agency for Drugs and Technologies in Health (CADTH). 2012. **Smoking cessation interventions for pregnant women and mothers of infants: a review of the clinical effectiveness, safety, and guidelines.** <http://www.cadth.ca/media/pdf/htis/mar-2012/RC0329%20Smoking%20Cessation%20Final.pdf>

This “rapid response report” from the CADTH provides a concise and accessible review of the evidence regarding the clinical effectiveness and safety/risk of smoking cessation interventions for pregnant women or mothers of infants and also a brief summary of the recommendations in three recent guidelines: the Canadian one and those of the Royal Australian College of General Practitioners and NICE. Only the NICE one is specific to pregnant women / new mothers.

American College of Obstetricians and Gynecologists. 2011. **Smoking cessation during pregnancy: A clinician's guide to helping pregnant women quit smoking.**

<https://www.acog.org/~media/Departments/Tobacco%20Alcohol%20and%20Substance%20Abuse/SCDP.pdf>

This publication is a "self-instructional guide and toolkit produced by the American College of Obstetricians and Gynecologists as continuing medical education for clinicians.

Glover M, Kira A. 2011. **Why Māori women continue to smoke while pregnant.** New Zealand Medical Journal, 124(1339), 22–31

This article reports on a qualitative exploratory study involving interviews with 60 pregnant Māori women aged from 17 to 43. The study aimed to determine the attitudes of pregnant Māori smokers towards smoking in pregnancy, the factors which influence continued smoking in pregnancy, and the family (whānau) support that the women received to quit. The women smoked an average of nine cigarettes per day and most (77%) reported no smoking related health problems. All the women lived with at least one other smoker, 62% socialised mostly with people who smoked and almost all said it was easy to smoke where they worked and socialised. The two most common reasons the women cited for contemplating quitting were "for their baby's health and their own health. The women had poor understanding of the risks related to smoking in pregnancy and low motivation to quit. The authors stated that their findings highlighted the need to involve families in smoking cessation interventions.

Schneider S, Huy C, Schutz J, et al. 2010. **Smoking cessation during pregnancy: a systematic literature review.** Drug Alcohol Rev, 29(1), 81–90

This review aimed to answer the specific question: "What are the differences between specific characteristics referring to social factors, smoking behaviour, personal relationships and pregnancy among women who successfully quit smoking during pregnancy in comparison to those who do not?" The review authors identified 19 relevant studies, published between January 1997 and March 2008. They summarised their results in a table showing the correlates of smoking cessation during pregnancy. The three factors that most inhibited a pregnant woman from quitting were having a partner who smokes, especially for women of low socio-economic status, a high degree of addiction and multiple previous pregnancies.

Websites

Quitline. 2014. **Smoking in pregnancy.** <http://www.quit.org.nz/23/reasons-to-quit/smoking-and-pregnancy> accessed May 2014.

This webpage provides links to Quitline's resources to help pregnant women quit smoking.

Note: The publications listed above were identified using the search methodology outlines in **Appendix 1**

SECOND-HAND CIGARETTE SMOKE EXPOSURE

Introduction

Beginning before birth, there are adverse health effects for children exposed to second-hand smoke. Children who are exposed to second-hand smoke have higher rates of sudden infant death, respiratory infections, wheeze and asthma, middle ear infections and meningitis [340]. It has been estimated that, in New Zealand each year, second-hand smoke exposure contributes to approximately 15,000 episodes of childhood asthma, more than 27,000 medical consultations for childhood respiratory problems and 1,500 operations to treat glue ear [341]. In New Zealand, as in other developed countries, as smoking rates in the general population have fallen, smoking has increasingly become concentrated in the most socio-economically disadvantaged sections of society [342]. Exposure to secondhand smoke is likely to be a significant contributor to socio-economic disparities in rates of many common childhood illnesses [340]. Children who grow up in smoking households are more likely than other children to grow up to be smokers [343].

The most recent New Zealand Tobacco Use Survey (2009) found that in just over 10% of households including one or more children aged 0–14 years, it was reported that at least one resident had smoked inside the house in the past week [342]. Māori households with children were significantly more likely to report that a resident had smoked inside the house than European/Other households and households with children in the most deprived NZDep quintile were five times more likely to report that a resident had smoked inside compared to such households in the least deprived quintile.

The 2010 National Year 10 ASH Snapshot Survey of tobacco use by students aged 14–15 years found that 38% of students reported that one or both of their parents smoked and 19% of students reported that people smoked inside their home [344]. Māori students were almost twice as likely as European students to report that a parent smoked. Between 2006 and 2010, there were small decreases in the percentage of students having a parent who smoked for Māori, Pacific and Asian students but not for European or Other students. There were, however, more significant decreases in the percentages of students reporting that people smoked inside their home suggesting that awareness of the danger of secondhand smoke may have increased.

The following section uses data from the 1996, 2006, and 2013 Censuses to review the proportion of children who lived in a household with a smoker.

Census Data

At the 1996, 2006, and 2013 Censuses, respondents aged 15 years or older were asked “Do you smoke cigarettes regularly (that is one or more per day)? This section considers the proportion of children aged 0–14 years who live in a household with someone who answered yes to this question.

Data Source and Methods

Indicator

Proportion of children aged 0–14 years who lived in a household with a smoker

Numerator: Number of children aged 0–14 years who lived in a household with someone who answered yes to the Census question “Do you smoke cigarettes regularly (that is one or more per day)?”

Denominator: The number of children aged 0–14 years at the 1996, 2006, and 2013 Censuses who lived in a household

Data Source

1996, 2006, and 2013 Censuses

Notes on Interpretation

Note 1: Census data categorises those aged 15 or more years into two groups: smokers and non-smokers, with missing responses in this analysis being assigned to the non-smoking category. Thus this data may underestimate the proportion of children living in a household with a smoker.



Note 2: Differences in the way ethnicity questions were structured between the 1996 and 2001 Censuses mean that ethnic specific rates for these two periods may not be strictly comparable. This must be kept in mind when interpreting the figures in this section.

New Zealand Distribution and Trends

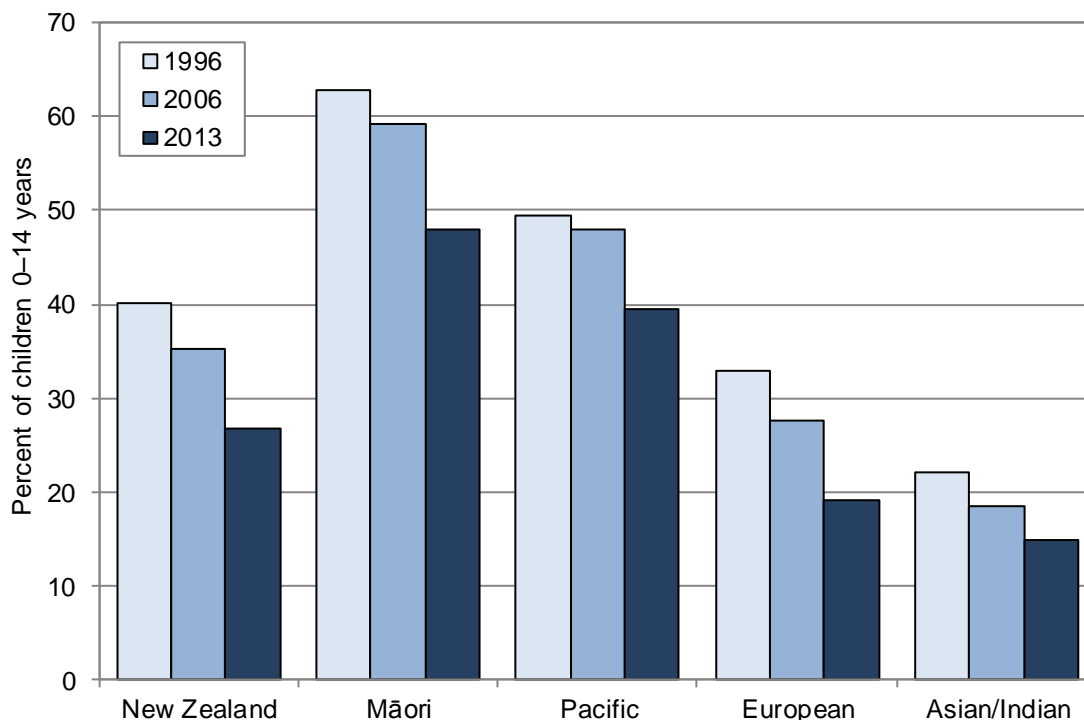
New Zealand Trends

In New Zealand, the proportion of children living in a household with a smoker declined from 40.2% in 1996 to 26.7% in 2013 (**Figure 46**).

Distribution by Ethnicity

At the 2013 Census, 48.0% of Māori and 39.5% of Pacific children lived in a household with a smoker, as compared to 19.1% of European and 14.8% of Asian/Indian children. The proportion of Māori (RR 2.51 95% CI 2.49–2.53) and Pacific (RR 2.06 95% CI 2.04–2.09) children living in a household with a smoker was *significantly higher* than for European children. In contrast, rates for Asian/Indian children (RR 0.77 95% CI 0.76–0.79) were *significantly lower* (**Figure 145, Figure 146, Table 53**). However, the proportion of children living in a household with a smoker declined for all ethnic groups between 1996 and 2013.

Figure 145. Percentage of children aged 0–14 years living in a household with a smoker by ethnicity, New Zealand at the 1996, 2006, and 2013 Censuses



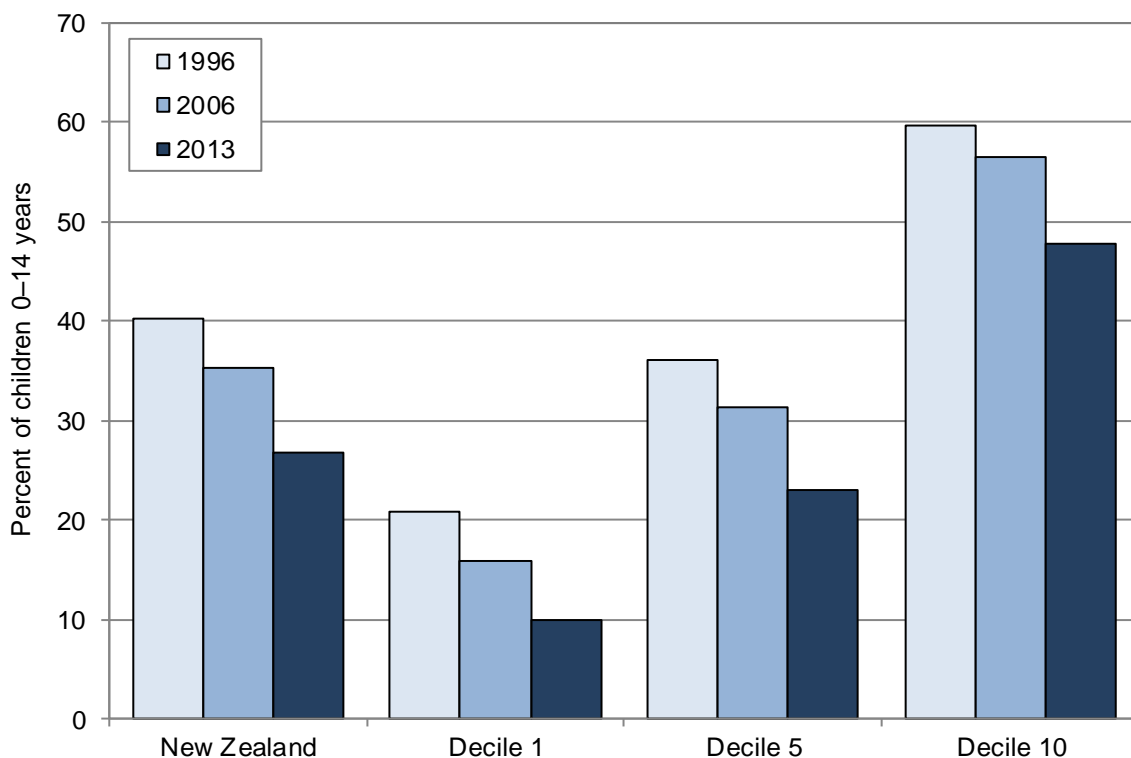
Source: Statistics New Zealand; Note: Ethnicity is level 1 prioritised

Distribution by NZ Deprivation Index Decile

At the 2013 Census, the proportion of children living in a household with a smoker increased from 9.9% for those in the least deprived areas (NZDep decile 1) to 47.7% for those in the most deprived areas (NZDep decile 10). During this period, rates for children in the most deprived areas were 4.81 (95% CI 4.71–4.91) times higher than for those in the least deprived areas (**Figure 147, Figure 148, Table 53**).

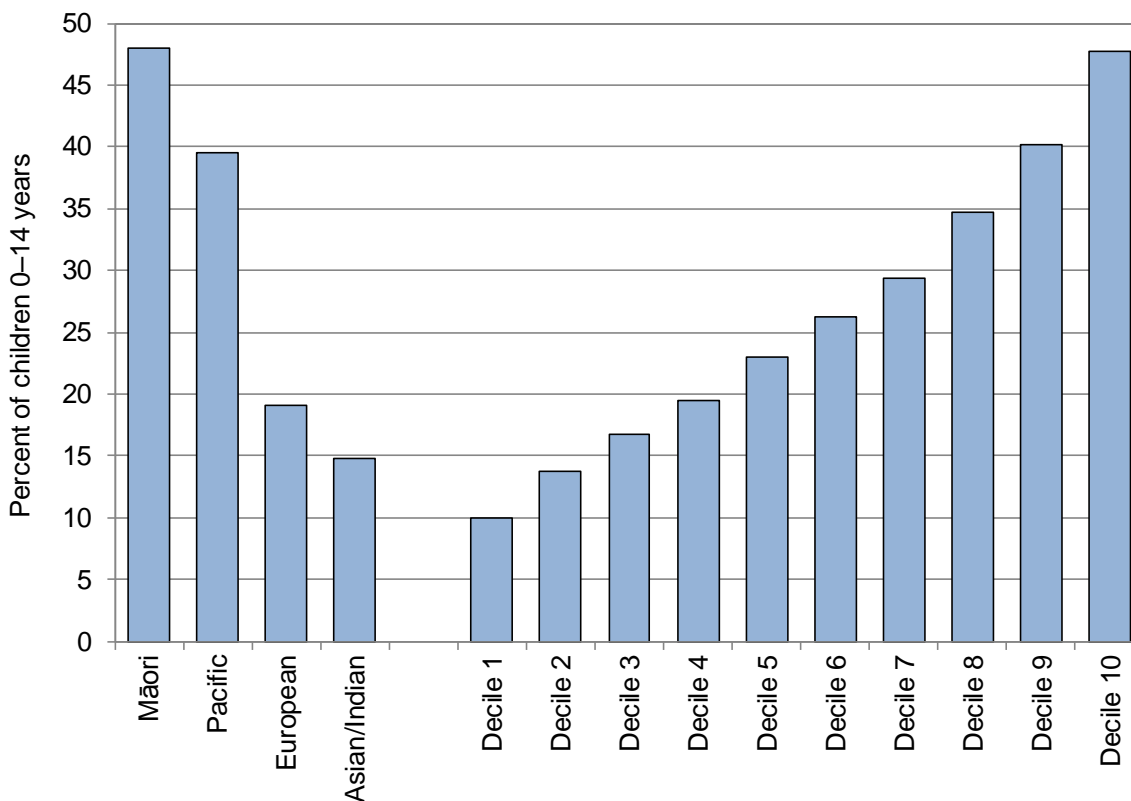


Figure 146. Percentage of children aged 0–14 years living in a household with a smoker by NZ Deprivation Index decile, New Zealand at the 1996, 2006 and 2013 Censuses



Source: Statistics New Zealand; Note: Decile is NZDep13

Figure 147. Percentage of children aged 0–14 years living in a household with a smoker by ethnicity and by NZ Deprivation Index decile, New Zealand at the 2013 Census



Source: Statistics New Zealand; Note: Ethnicity is level 1 prioritised; Decile is NZDep13

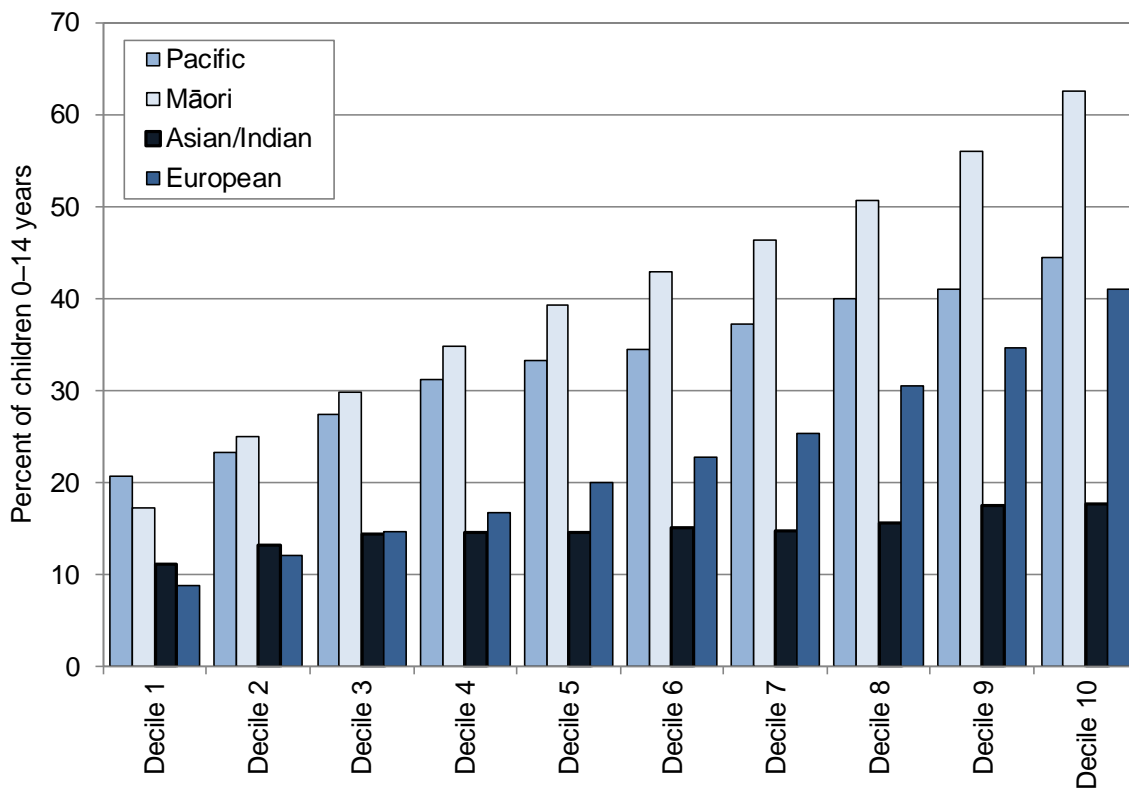


Table 53. Children aged 0–14 years living in a household with a smoker by ethnicity and NZ Deprivation Index decile, New Zealand at the 2013 Census

Variable	Number of children	Percent of children	Rate ratio	95% CI
Children 0–14 years living in a household with a smoker				
Ethnicity				
Māori	94,188	48.0	2.51	2.49–2.53
Pacific	29,589	39.5	2.06	2.04–2.09
Asian/Indian	12,987	14.8	0.77	0.76–0.79
European	82,353	19.1	1.00	
NZ Deprivation Index decile				
Decile 1	8,646	9.9	1.00	
Decile 2	11,583	13.8	1.39	1.35–1.42
Decile 3	13,500	16.7	1.69	1.64–1.73
Decile 4	15,378	19.4	1.96	1.91–2.01
Decile 5	18,036	23.0	2.32	2.26–2.37
Decile 6	20,400	26.2	2.65	2.59–2.71
Decile 7	22,620	29.4	2.96	2.90–3.03
Decile 8	27,705	34.7	3.51	3.43–3.58
Decile 9	35,625	40.2	4.06	3.97–4.15
Decile 10	51,507	47.7	4.81	4.71–4.91

Source: Statistics New Zealand; Note: Ethnicity is level 1 prioritised; Decile is NZDep13

Figure 148. Percentage of children aged 0–14 years living in a household with a smoker by ethnicity and NZ Deprivation Index decile, New Zealand at the 2013 Census



Source: Statistics New Zealand; Note: Ethnicity is level 1 prioritised; Decile is NZDep13



Distribution by Ethnicity and NZ Deprivation Index Decile

At the 2013 Census, the proportion of children living in a household with a smoker increased with increasing NZDep deprivation for each of New Zealand's largest ethnic groups. At each level of NZDep deprivation, however, a higher proportion of Māori than European or Asian/Indian children lived in a household with a smoker. For Pacific children, rates in the least deprived areas (NZDep decile 1–2) were similar to those of Māori children. However, in the most deprived areas (NZDep decile 10), rates for Pacific children were more similar to those of European children (**Figure 148**).

Northern DHBs Distribution and Trends

Northern DHBs Distribution

At the 2013 Census, 34.1% of Northland, 20.7% of Waitemata, 18.4% of Auckland and 31.7% of Counties Manukau children lived in a household with a smoker, with rates in Northland and Counties Manukau being *significantly higher* than the New Zealand rate, and rates in the Auckland and Waitemata DHBs being *significantly lower* (**Table 54**).

Table 54. Children aged 0–14 years living in a household with a smoker, Northern DHBs vs. New Zealand at the 2013 Census

DHB	Number of children	Percent of children	Rate ratio	95% CI
Children 0–14 years living in a household with a smoker				
Northland	10,854	34.1	1.28	1.26–1.30
Waitemata	21,993	20.7	0.77	0.76–0.78
Auckland	14,091	18.4	0.69	0.68–0.70
Counties Manukau	35,175	31.7	1.19	1.18–1.20
New Zealand	225,048	26.7	1.00	

Source: Statistics New Zealand

Northern DHB Trends

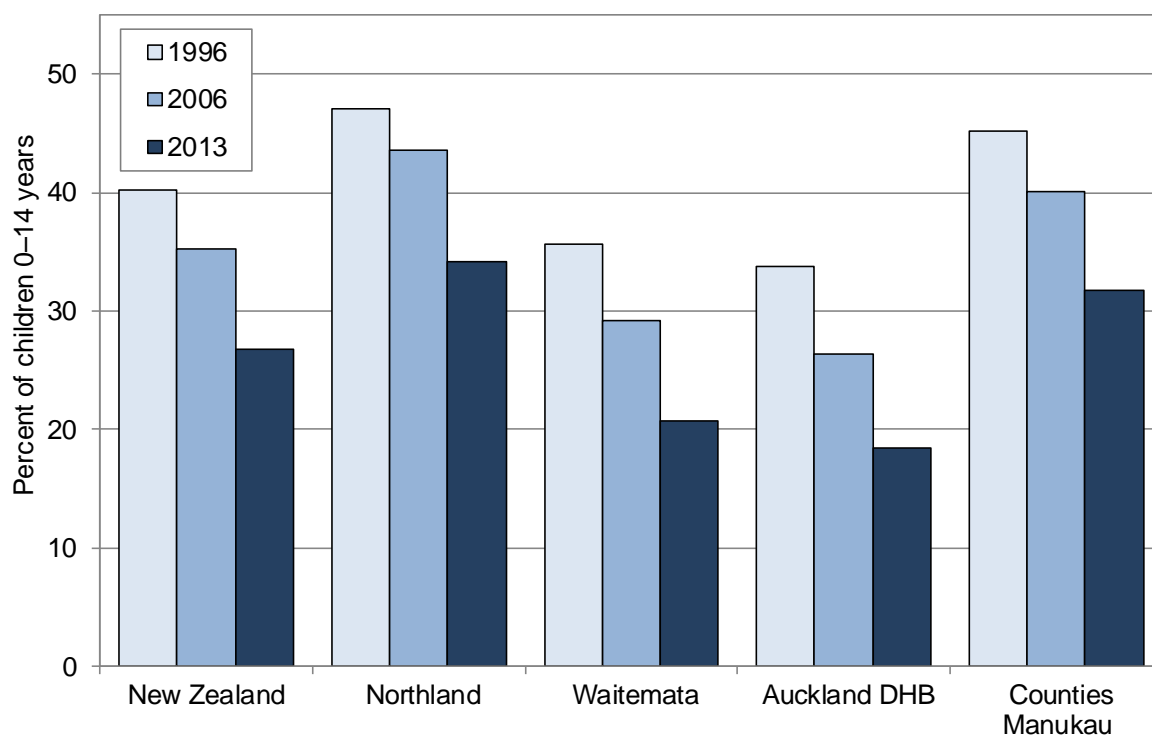
The proportion of children living in a household with a smoker declined in all four of the Northern DHBs between 1996 and 2013 (**Figure 155**).

Distribution by Ethnicity

In the Waitemata, Auckland and Counties Manukau DHBs a higher proportion of Māori and Pacific children than European and Asian/Indian children lived in a household with a smoker at the 2013 Census, while in Northland a higher proportion of Māori than European children lived in a household with a smoker (**Figure 156**).

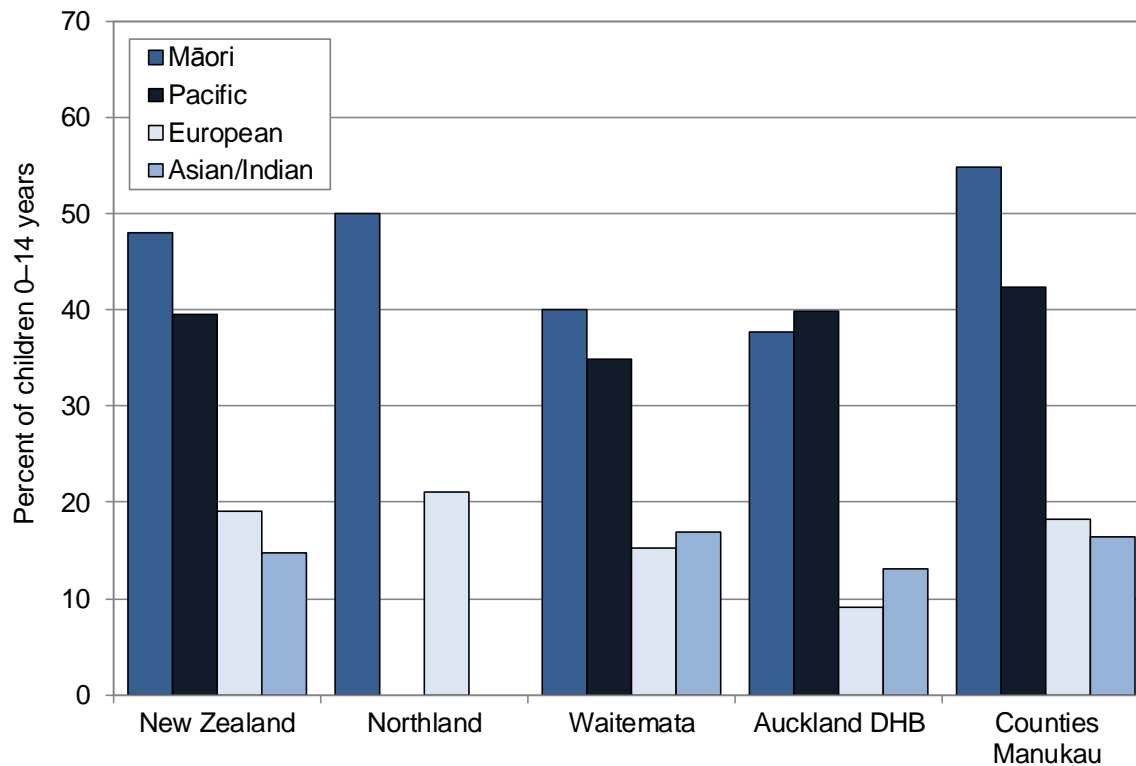


Figure 149. Percentage of children aged 0–14 years living in a household with a smoker, Northern DHBs vs. New Zealand at the 1996, 2006, and 2013 Censuses



Source: Statistics New Zealand

Figure 150. Percentage of children aged 0–14 years living in a household with a smoker by ethnicity, Northern DHBs vs. New Zealand at the 2013 Census



Source: Statistics New Zealand; Note: Ethnicity is level 1 prioritised

Local Policy Documents and Evidence Based Reviews Relevant to Second-Hand Smoke Exposure in Children

In New Zealand, there is no national strategy focused on the prevention of second-hand cigarette exposure in children. Any local strategies developed will need to incorporate evidence from a variety of sources. **Table 55** (below) provides an overview of a range of New Zealand policy documents and evidence-based reviews which may be useful in this context. In addition, **Table 52** (page 294) provides an overview of publications relevant to the cessation of smoking in pregnancy, and **Table 58** (page 318) and **Table 59** (page 323) address the prevention and cessation of smoking in young people.

Table 55. Local policy documents and evidence based reviews relevant to the prevention of exposure to second-hand cigarette smoke in children

Ministry of Health publications
<p>Ministry of Health. 2014. Well Child / Tamariki Ora Programme Practitioner Handbook: Supporting families and whānau to promote their child's health and development. Revised 2014. Wellington: Ministry of Health. http://www.health.govt.nz/publication/well-child-tamariki-ora-programme-practitioner-handbook-2013</p> <p>This handbook states that all healthcare workers have a responsibility to assist people to stop smoking and that Māori, Pacific peoples, pregnant women and breastfeeding mothers are priority population groups for cessation support. At each well child contact, practitioners should ask about the child's smoke exposure, explain the effects of smoke inhalation on infants and children, encourage families to give their children a smokefree environment and give positive reinforcement for any behaviour changes identified. Practitioners should implement the ABC approach (Ask, Brief advice, cessation support) for smoking support.</p>
New Zealand guidelines
<p>Ministry of Health. 2007. New Zealand Smoking Cessation Guidelines. Wellington: Ministry of Health. http://www.health.govt.nz/publication/new-zealand-smoking-cessation-guidelines</p> <p>The smoking cessation guidelines recommend that all health workers should be aware of the risks of second-hand smoke to children and young people exposed to smoking in their families and homes. Brief advice and cessation support to should be offered to all family members who smoke.</p>
Evidence-based medicine reviews
<p>Been JV, Nurmatov UB, Cox B, et al. 2014. Effect of smoke-free legislation on perinatal and child health: a systematic review and meta-analysis. <i>Lancet</i>, 383(9928), 1549–60</p> <p>This review reported on a random-effects meta-analysis of the results of 11 interrupted time-series studies looking at the effects of smoking bans in workplaces, public places or both and one or more predefined early life indicators (preterm birth, low birthweight and hospital attendance for asthma). Five studies from North America described district or state-wide bans and six European studies described national bans. One study was considered at high risk of bias, six at moderate risk and four at low risk. Smoke-free legislation was associated with reductions in preterm birth (four studies, 1,366,862 individuals; -10.4% [95% CI -18.8 to -2.0]; $p=0.016$) and hospital attendances for asthma (three studies, 225,753 events: -10.1% [95% CI -15.2 to -5.0]; $p=0.0001$). No significant effect on low birthweight was identified (six studies, >1.9 million individuals: -1.7% [95% CI -5.1 to 1.6]; $p=0.31$). The review authors concluded that smokefree legislation is associated with substantial reductions in rates of pre-term birth and hospital attendances for asthma and that their study provided strong support for WHO's recommendation of smoke free environments.</p>
<p>Baxi R, Sharma M, Roseby R, et al. 2014. Family and carer smoking control programmes for reducing children's exposure to environmental tobacco smoke. <i>Cochrane Database Syst Rev</i>, 3, CD001746 http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001746.pub3/abstract</p> <p>This updated review included 57 controlled trials (21 more than the 2008 review) assessing the effectiveness of interventions to reduce children's exposure to environmental tobacco smoke (ETS). Most of the interventions were conducted in healthcare settings ("well child", "ill child" or both) and but seven were targeted at populations or communities. Only 14 studies found a statistically significant effect of the intervention in reducing children's exposure to ETS. Of these 14 studies, only six used objective measures of children's ETS exposure, such as measurement of urinary or salivary cotinine or household air nicotine. Eight were considered to be at high risk of bias, two at low risk and four at unclear risk. In the 14 studies finding a significant effect, a variety of interventions were used: seven used intensive counselling or motivational interviewing, one used telephone counselling, one a school-based strategy, one picture books, two educational home visits, and one brief intervention. One study did not describe the intervention. The review authors noted that in 32 of the 57 studies included in the review there was a reduction in children's ETS exposure irrespective of whether the children were in the intervention or the control group. They concluded that their review was unable to determine if any one intervention reduced parental smoking and child ETS exposure more than any other but they stated that they had identified seven studies reporting that motivational interviewing or intensive counselling provided in clinical settings were effective.</p>

Rosen LJ, Myers V, Hovell M, et al. 2014. **Meta-analysis of parental protection of children from tobacco smoke exposure.** *Pediatrics*, 133(4), 698–714. <http://pediatrics.aappublications.org/content/133/4/698.long>

This systematic review and meta-analysis aimed to quantify the effect of interventions aimed at decreasing children's tobacco smoke exposure (TSE). It included 30 studies (RCTs, quasi-RCTs and controlled trials) involving parents of 0–6 year old children. The studies examined various types of interventions that had, as one of their aims, helping parents to decrease their children's TSE. Interventions included various components: self-help materials (20 studies), face to face counselling (20 studies), telephone counselling (13 studies), biochemical feedback (4 studies), air cleaners (2 studies) and free nicotine replacement therapy for parents (1 study). Study outcomes were parentally-reported tobacco or protection (PREP), parentally reported number of cigarettes smoked around the child, and biomarkers of tobacco exposure such as levels of nicotine or cotinine in urine, blood, saliva or hair. PREP included home smoking bans, changing location of smoking, and moving the child away from others' smoking. For the 17 studies assessing PREP at follow-up (6,820 participants), there was evidence of small benefit from the interventions: relative risk (RR) 1.12, (95% CI 1.07 to 1.18, $p < 0.0001$) and 7% more children were protected in the intervention than the control groups (risk difference (RD) 0.07, 95% CI 0.05 to 0.09). Overall, for the 8 studies (908 participants) reporting of numbers of cigarettes smoked, at follow up, intervention parents smoked fewer cigarettes around children than control parents ($p = 0.03$). For the 13 studies using biomarkers (2,601 participants) results suggested that there was lower child TSE in the intervention groups but the overall risk difference was not statistically significant (RD -0.05 , 95% CI -0.13 to 0.03 , $p = 0.20$). The review authors concluded that interventions to prevent children's TSE are moderately beneficial at the individual level and that, at the population level, the benefits from these interventions could have significant public health impact.

Rosen LJ, Noach MB, Winickoff JP, et al. 2012. **Parental Smoking Cessation to Protect Young Children: A Systematic Review and Meta-analysis.** *Pediatrics*, 129(1), 141–52.

<http://pediatrics.aappublications.org/content/129/1/141.abstract>

The eighteen controlled trials included in this review (7,053 participants in total) were all included in the Cochrane review above. Unlike the Cochrane review, which included interventions for family members other than parents, and child care workers and teachers, and both smoking prevention and cessation interventions, this review included only controlled trials of interventions targeting smoking parents of young children (0–6 years). Interventions included self-help, counselling and medication and they took place in a range of settings. Thirteen of the studies found a positive effect from the intervention and in four of them the effect was statistically significant. The weighted mean quit rate for the intervention groups was 23.1% and for the control groups, 18.4%. Meta-analysis gave an overall risk ratio (RR) of 1.34 (95% CI 1.05–1.71) and a risk difference of 0.04 (95% CI 0.01–0.07, $p = 0.005$) indicating that an additional 4% of parents quit smoking in the intervention groups compared to the control groups. In subgroup analyses, interventions were beneficial when they were provided to parents of children four years and over, when they included the use of cessation medication, when they had cessation as their primary purpose and when they had high follow up rates (>80%). The review authors concluded that smoking cessation interventions for parents are worthwhile but that additional strategies are needed to protect children from harm due to tobacco smoke.

Alpert HR, Behm I, Clancy L, et al. 2010. **Effect of smoke-free home and workplace policies on second-hand smoke exposure levels in children: an evidence summary.** *Pediatric Health*, 4, 391.

This article reviews and summarises evidence from studies reporting on laws for the protection of non-smokers, 'voluntary' home smoking restrictions and smoking behaviour of continuing smokers in households with children aged 0–17 years. The authors were unable to perform a full systematic review due to the paucity of studies in this area. Most of the 19 relevant studies identified were observational cross-sectional studies and the review authors noted that these are susceptible to selection bias, recall bias and misclassification bias. Three studies examined the effect of 'voluntary' home smoking restrictions and four examined the effects of 'mandated' workplace smoke-free policies on children's health and smoking status. Household smoking restrictions generally had a positive effect on children's SHS exposure, producing significant reductions of between 20 and 50% following the introduction of smoke-free home policies. Workplace smoke-free policies also had positive effects, as shown by the results of national surveys in Scotland, Ireland, Wales and Spain although a Hong Kong study showed the opposite effect (according to self-report) one year after the introduction of comprehensive smoke-free legislation in 2007. The Scottish survey included measurements of children's urinary cotinine and found a significant reduction of 50%, confirming reductions in children's SHS exposure one year after smoke free legislation. The Irish study found a significant reduction in pre-term births (25%) and a quasi-experimental U.S. study reported a significant 16% reduction in hospital diagnosed emergency asthma visits in people aged under 19 years after the introduction of comprehensive smoke-free legislation. The authors concluded that the current evidence suggests that reduction in SHS in public settings will eventually lead to reductions in SHS in private settings but that smoke-free home policies will provide additional benefits.

In their commentary on this review, which can be found here:

<http://www.crd.york.ac.uk/crdweb/ShowRecord.asp?ID=12011000974#.U4OzvmSx8E> the CRD stated that the reviews conclusions should be interpreted with caution given the limited methodological rigour of the studies included.

Other relevant publications

Healey B, Edwards R, Wilson N, et al. 2013. **The important persisting problem of smoking in cars with children: new data from a multi-year national survey of young people.** New Zealand Medical Journal, 126(1369), 86–9

Currently smoking in cars with children is not prohibited in New Zealand. This article reports on an analysis of unpublished data from the national-level annual ASH surveys of New Zealand's Year-10 students from 2006–2012. In each of the seven years more than 20% of the adolescents reported exposure to others' smoking in a car or van and while there had been a decline in the percentage over the period, it was relatively small, suggesting that, at the current rate of decline it will be 2028 before it drops below 2%. The authors stated that there is a strong public health case for New Zealand to follow other nations in banning smoking in vehicles with children.

Royal College of Physicians. 2010. **Passive Smoking and Children. A report by the Tobacco Advisory Group.** London: Royal College of Physicians. <http://www.rcplondon.ac.uk/sites/default/files/documents/passive-smoking-and-children.pdf>

This comprehensive report from the U.K. used both reviews of relevant literature and some new analysis to estimate the prevalence, determinants and trends in passive smoking exposure (PSE), report on the evidence of the effects of PSE on fetal and reproductive health and on children's health, and to estimate the effect of PSE on the numbers of children taking up smoking. It also considered the costs of PSE to the NHS and to wider society, and the ethical issues relating to PSE and children, before concluding with policy options to reduce children's PSE.

U.S. Department of Health and Human Services. 2006. **The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General.** Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. <http://www.ncbi.nlm.nih.gov/books/NBK44324/>

Chapter 6 of this report reviews the evidence concerning the effects of secondhand smoke on respiratory illness in children. It concludes that the evidence is sufficient to infer a causal relationship between secondhand smoke exposure from parental smoking and lower respiratory illness (in infants and children), acute and recurrent middle ear infection and chronic middle ear effusion ("glue ear") in children, phlegm, wheeze, breathlessness and ever having had asthma in school aged children, and a lower level of lung function during childhood. The report also states that eliminating smoking from indoor spaces entirely is the only way to protect non-smokers from secondhand smoke.

Note: The publications listed were identified using the search methodology outlined in **Appendix 1**

TOBACCO USE IN YOUNG PEOPLE

Introduction

Tobacco smoking is the leading cause of preventable and premature death and a significant contributor to ethnic and socioeconomic disparities in health, both in New Zealand and internationally [345,346]. Most adult smokers started smoking in adolescence. Only one percent of smokers had their first cigarette after age 25 [346]. While many of the serious health consequences of smoking, such as lung cancer and heart disease, tend to affect older people, there are health consequences for young smokers. The US Surgeon General's 2012 report *Preventing tobacco use among youth and young adults* [346] concluded that there was sufficient evidence that smoking caused nicotine addiction beginning in adolescence and young adulthood, reduced lung function and lung growth during childhood and adolescence, and led to early abdominal atherosclerosis in young adults. The report found that the evidence suggested that smoking contributes to future use of marijuana and other illicit drugs and coronary atherosclerosis in adulthood and that smoking is not associated with weight loss.

Action on Smoking and Health New Zealand (ASH) has been monitoring year 10 student smoking since 1999. Youth smoking rates have declined almost every year over the period and the 2012 ASH figures are significantly lower than those for 2010. Smoking prevalence increased with decreasing socio-economic status and it was also highest among Māori young women. Findings from the New Zealand Year 10 survey in 2002 indicated that young people were more likely to smoke on a daily basis if their parents smoked (especially if both parents did), if they had pocket money of more than \$5 per week and their best friend smoked [347]. The 2006 New Zealand Year 10 survey found that exposure to second-hand smoke and lack of parental anti-smoking expectations were independently associated with smoking susceptibility and current smoking, and that receiving pocket money, and an absence of monitoring of expenditure were associated with smoking susceptibility and current smoking. Findings were similar whether or not one or more parents were smokers [348].

The following section uses data from the 1996, 2006, and 2013 Censuses to review the proportion of young people aged 15–24 years who were regular smokers. This section also uses the Action on Smoking and Health (ASH) survey data to review the prevalence of smoking in Year 10 (aged 14–15 years) secondary school students and the 2012/13 New Zealand Health Survey to describe the prevalence of daily smoking amongst young people aged 15–24 years.

Census Data

Data Source and Methods

Definition

Proportion of young people aged 15–24 years who were regular smokers

Data Source

Numerator: NZ Census: The number of young people aged 15–24 years who answered “yes” to the Census question “Do you smoke cigarettes regularly (that is one or more per day)?”

Denominator: NZ Census: The number of young people aged 15–24 years who were home on Census night

Notes on Interpretation

Note 1: Census data categorises those aged 15–24 years into two groups: smokers and non-smokers, with missing responses in this analysis being assigned to the non-smoking category. These data may, therefore, underestimate the proportion of smokers in this age group.

Note 2: Differences in the way ethnicity questions were structured between the 1996 and 2001 Censuses mean that ethnic specific rates for these two periods may not be strictly comparable. This must be kept in mind when interpreting the figures in the section which follows.



New Zealand Distribution and Trends

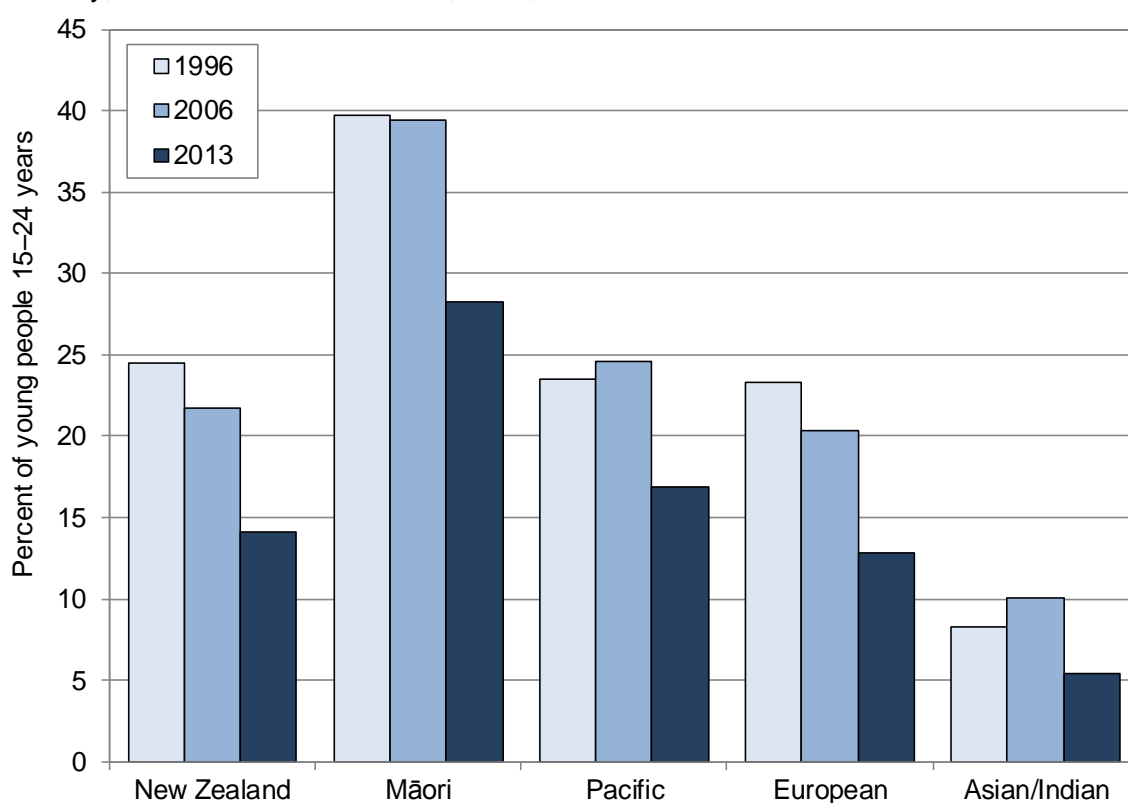
New Zealand Trends

In New Zealand, the proportion of young people who were regular smokers declined from 24.5% in 1996 to 14.1% in 2013 (**Figure 46**).

Distribution by Ethnicity

At the 2013 Census, 28.2% of Māori and 16.9% of Pacific young people were regular smokers, as compared to 12.8% of European and 5.4% of Asian/Indian young people. The proportion of Māori (RR 2.20 95% CI 2.17–2.23) and Pacific (RR 1.31 95% CI 1.28–1.34), young people who were regular smokers was *significantly higher* than for European young people. In contrast, rates for Asian/Indian young people (RR 0.42 95% CI 0.41–0.43) were *significantly lower* (**Figure 46, Figure 48, Table 13**). However, the proportion of young people who were regular smokers declined for all ethnic groups between 1996 and 2013.

Figure 151. Percentage of young people aged 15–24 years who were regular smokers by ethnicity, New Zealand at the 1996, 2006, and 2013 Censuses



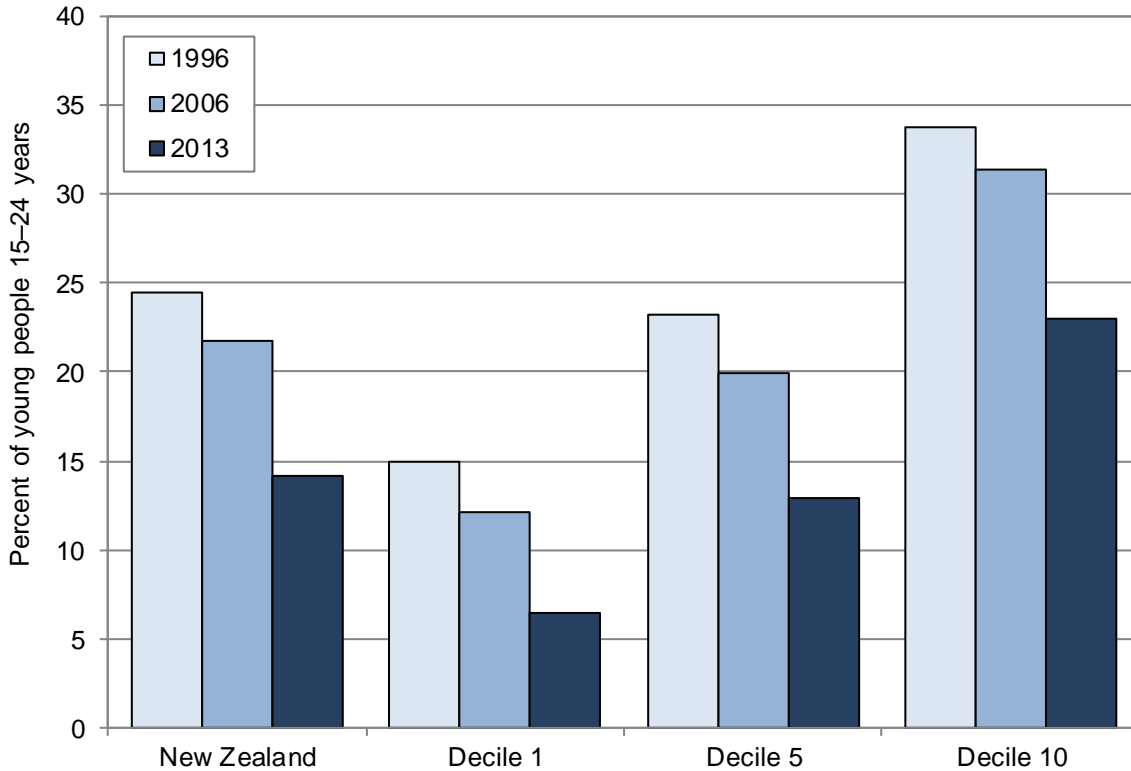
Source: Statistics New Zealand; Note: ethnicity is level 1 prioritised

Distribution by NZ Deprivation Index Decile

At the 2013 Census, the proportion of young people who were regular smokers increased from 6.5% for those in the least deprived areas (NZDep decile 1) to 23.1% for those in the most deprived areas (NZDep decile 10). During this period, smoking rates for young people in the most deprived areas were 3.55 (95% CI 3.43–3.68) times higher than for those in the least deprived areas (**Figure 47, Figure 48, Table 13**).

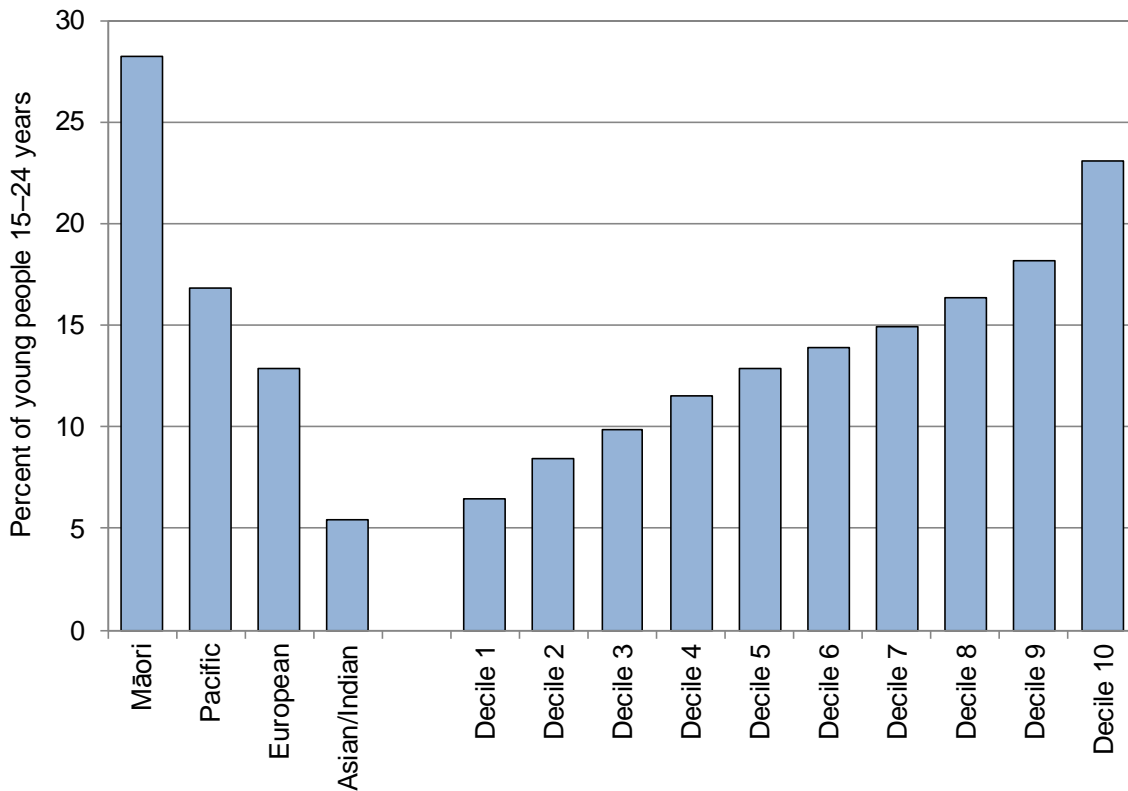


Figure 152. Percentage of young people aged 15–24 years who were regular smokers by NZ Deprivation Index decile, New Zealand at the 1996, 2006, and 2013 Censuses



Source: Statistics New Zealand; Note: decile is NZDep13

Figure 153. Percentage of young people aged 15–24 years who were regular smokers by ethnicity and by NZ Deprivation Index decile, New Zealand at the 2013 Census



Source: Statistics New Zealand; Note: ethnicity is level 1 prioritised; decile is NZDep13

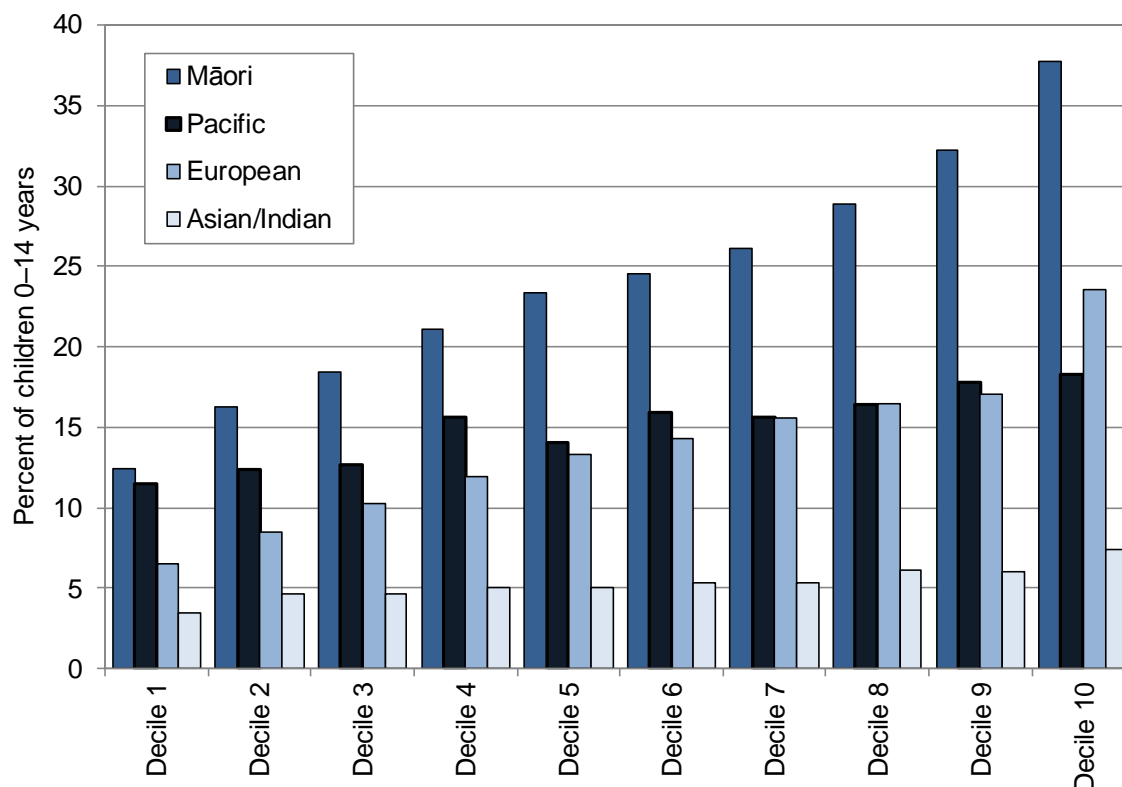


Table 56. Young people aged 15–24 years who were regular smokers by ethnicity and NZ Deprivation Index decile, New Zealand at the 2013 Census

Variable	Number of young people	Percent of young people	Rate ratio	95% CI
Young people aged 15–24 years who were regular smokers				
Ethnicity				
Māori	30,216	28.2	2.20	2.17–2.23
Pacific	7,857	16.9	1.31	1.28–1.34
Asian/Indian	4,302	5.4	0.42	0.41–0.43
European	39,423	12.8	1.00	
NZ Deprivation Index decile				
Decile 1	3,201	6.5	1.00	
Decile 2	4,404	8.4	1.30	1.25–1.36
Decile 3	5,100	9.8	1.52	1.46–1.58
Decile 4	6,057	11.5	1.78	1.71–1.85
Decile 5	7,122	12.9	1.98	1.91–2.06
Decile 6	7,803	13.9	2.14	2.06–2.23
Decile 7	8,925	15.0	2.31	2.22–2.40
Decile 8	10,908	16.4	2.53	2.43–2.62
Decile 9	13,095	18.2	2.80	2.70–2.91
Decile 10	16,260	23.1	3.55	3.43–3.68

Source: Statistics New Zealand; Note: ethnicity is level 1 prioritised; decile is NZDep13

Figure 154. Percentage of young people aged 15–24 years who were regular smokers by ethnicity and NZ Deprivation Index decile, New Zealand at the 2013 Census



Source: Statistics New Zealand; Note: ethnicity is level 1 prioritised; decile is NZDep13



Distribution by Ethnicity and NZ Deprivation Index Decile

At the 2013 Census, the proportion of young people who were regular smokers increased with increasing deprivation for each of New Zealand's ethnic groups. At each level of deprivation, however, a higher proportion of Māori > European and Pacific > Asian/Indian young people were regular smokers (**Figure 49**).

Northern DHBs Distribution and Trends

Northern DHBs Distribution

At the 2013 Census, 18.2% of Northland, 10.5% of Waitemata, 9.3% of Auckland and 13.7% of Counties Manukau young people were regular smokers. Rates in Northland were *significantly higher* than the New Zealand rate while rates in the Waitemata, Auckland and Counties Manukau DHBs were *significantly lower* (although in the case of Counties Manukau the magnitude of this difference was not large) (**Table 57**).

Table 57. Young people aged 15–24 years who were regular smokers, Northern DHBs vs. New Zealand at the 2013 Census

DHB	Number of young people	Percent of young people	Rate ratio	95% CI
Young people aged 15–24 years who were regular smokers				
Northland	3,039	18.2	1.29	1.25–1.33
Waitemata	7,503	10.5	0.74	0.72–0.76
Auckland	6,570	9.3	0.66	0.65–0.68
Counties Manukau	9,675	13.7	0.97	0.95–0.99
New Zealand	82,896	14.1	1.00	

Source: Statistics New Zealand

Northern DHB Trends

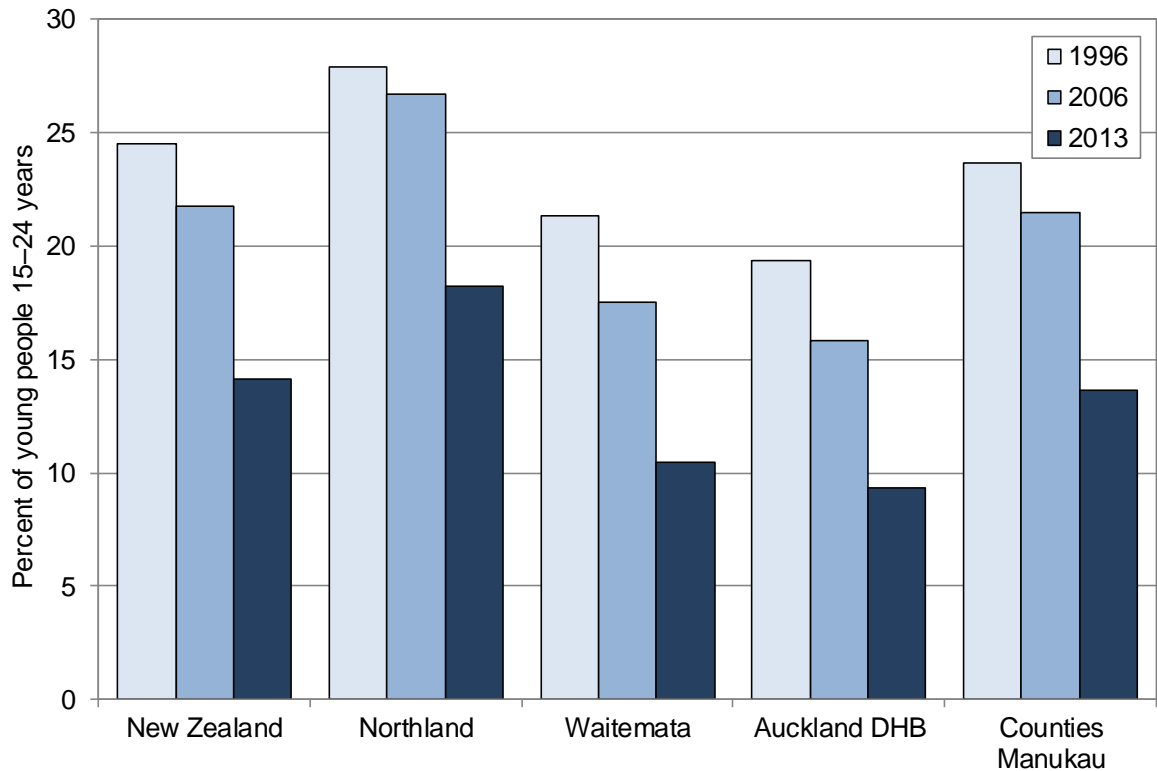
In all four of the Northern DHBs, the proportion of young people who were regular smokers declined between 1996 and 2013, with the largest declines occurring between 2006 and 2013 (**Figure 155**).

Distribution by Ethnicity

In the Waitemata, Auckland and Counties Manukau DHBs, a higher proportion of Māori > Pacific > European > Asian/Indian young people were regular smokers at the 2013 Census, while in Northland a higher proportion of Māori than European young people were regular smokers (**Figure 156**).

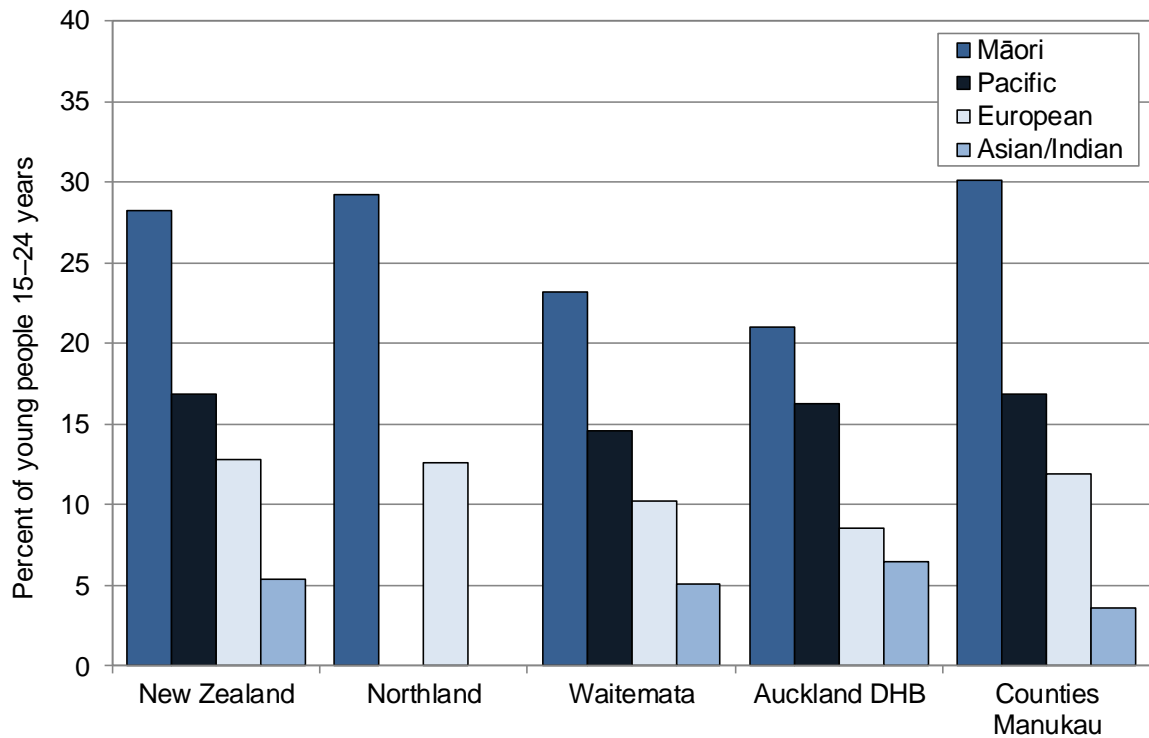


Figure 155. Percentage of young people aged 15–24 years who were regular smokers, Northern DHBs vs. New Zealand at the 1996, 2006 and 2013 Censuses



Source: Statistics New Zealand

Figure 156. Percentage of young people aged 15–24 years who were regular smokers by ethnicity, Northern DHBs vs. New Zealand at the 2013 Census



Source: Statistics New Zealand; Note: ethnicity is level 1 prioritised



ASH Year 10 Survey

The Year 10 ASH Smoking Survey has been used to monitor smoking in 14 and 15 year old students since 1999. The survey samples around half of the secondary schools with Year 10 students in New Zealand, and sample sizes typically exceed 25,000 students each year [349]. The results reflect the smoking behaviour of secondary school students aged 14 and 15 years, and are useful for understanding trends and risk factors for smoking initiation.

Data Source and Methods

Definition

1. Proportion of Year 10 students who are daily smokers
2. Proportion of Year 10 students who have never smoked

Data source: ASH Surveys

Numerator: Number of Year 10 students who are daily smokers
Number of Year 10 students who have never smoked

Denominator: Number of Year 10 students surveyed

Notes on Interpretation

Note 1: Action on Smoking and Health (ASH) was established in 1982 with the aim of reducing smoking and smoking-related premature deaths. While the Ministry of Health provides funding for the annual national Year 10 Smoking Survey, ASH manages the data collection and oversees its analysis [349]. Since 1997, ASH has conducted annual surveys of smoking behaviour in Year 10 (14 to 15 year old) students, and since 1999 has collected information from more than 25,000 students annually.

Note 2: Questionnaires are self-administered and cover demographic variables as well as smoking-related issues. Survey forms with instructions are mailed to all secondary schools and teachers supervise the completion of the questionnaires by students. It has been suggested that such a design means it is not always clear how the sample has been selected and how consistently the survey has been administered, however, the large sample size and annual frequency makes the survey useful for monitoring smoking behaviour of Year 10 students in New Zealand, and a useful tool for understanding trends and risk factors for smoking initiation [350].

Note 3: In 2000 and 2001, over 70% of schools in NZ participated and of these, 70% of enrolled students took part [351]. Since then, however, participation rates have declined, with school response rates being 67% in 2002, 66% in 2003, 65% in 2004, 58% in 2005, 57% in 2006, 47% in 2007 and 54% in 2008. In 2008, compared to the national Year 10 population, Māori and low decile schools were underrepresented. This underrepresentation is likely to systematically bias the results of later surveys, with the proportion of young people living with parents who smoke, or in a home with smoking inside, likely to be increasingly under-represented in these figures [352].

Note 4: The data presented in this section are based on the estimates for the whole population based on the Year 10 sample as reported by ASH, and are available from <http://www.ash.org.nz/>

New Zealand Distribution and Trends

New Zealand Trends

In New Zealand during 1999–2013 the proportion of Year 10 students who were daily smokers declined, from 15.6% in 1999 to 3.2% in 2013. Similarly, the proportion who had never smoked increased, from 31.6% in 1999 to 75.1% in 2013 (**Figure 159**).

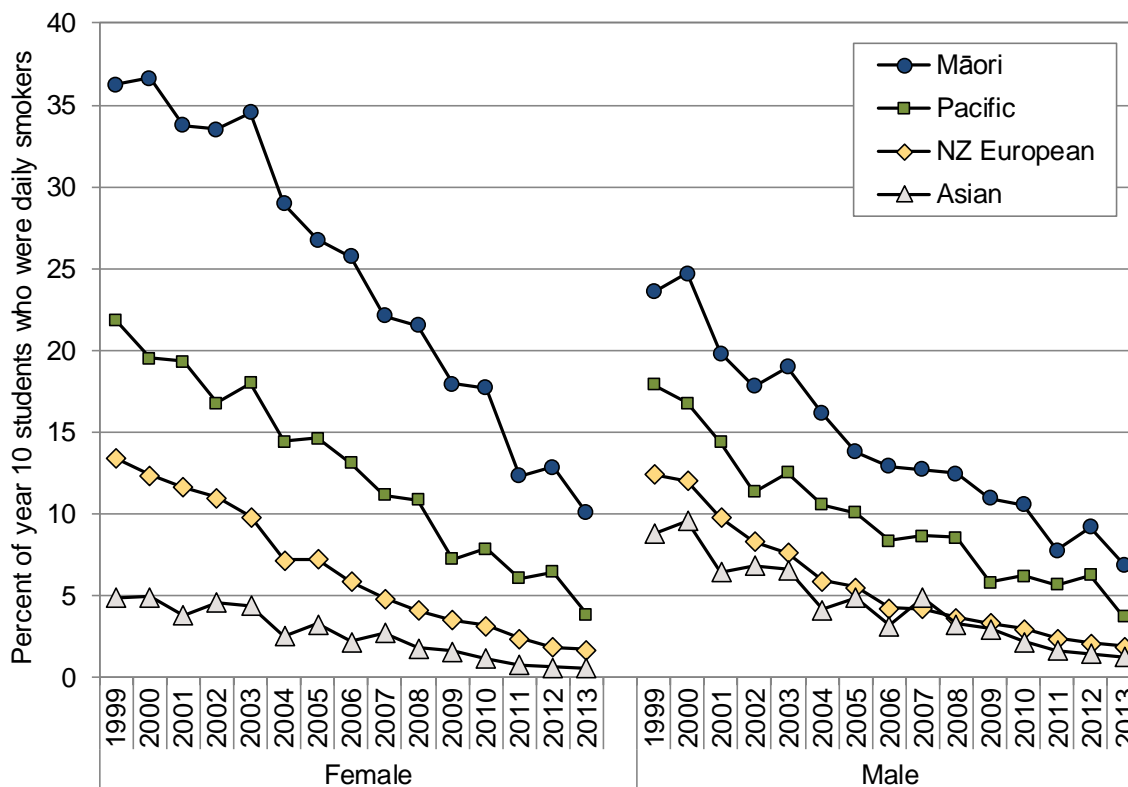
Distribution by Gender and Ethnicity

In New Zealand during 1999–2013, daily smoking rates for Māori and Pacific students were higher for females than for males, while rates for Asian students were higher for males. There were also marked ethnic differences in daily smoking during this period. The proportion of Māori and Pacific students that smoked daily were consistently higher than rates for NZ European and Asian students (**Figure 157**).

Daily smoking rates declined for students of all ethnic groups during 1999–2013. For Māori students, the rates fell from 30.3% in 1999 to 8.5% in 2013, and from 19.9% to 3.8% for Pacific students. The rates of students smoking daily declined from 12.9% in 1999 to 1.8% in 2013 for NZ European students, and from 7.0% to 1.0% for Asian students.



Figure 157. Percentage of Year 10 students who were daily smokers by gender and ethnicity, New Zealand 1999–2013



Source: ASH Year 10 surveys; Note: ethnicity is prioritised

Distribution by Gender and Socioeconomic Status

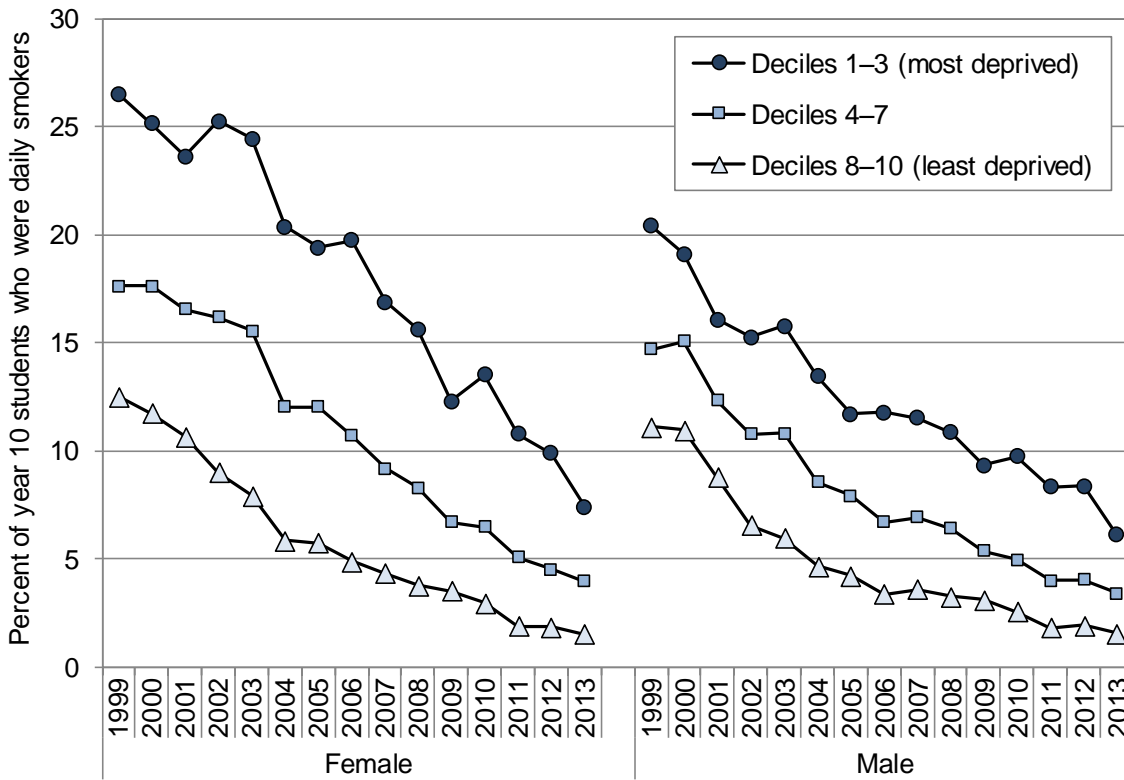
In New Zealand during 1999–2013, daily smoking rates were higher for students attending schools in the most deprived areas (school socioeconomic deciles 1–3), and lowest among the least deprived areas (school socioeconomic deciles 8–10).

While gender differences were again evident, these diminished as the level of deprivation decreased. Higher rates of daily smoking were seen for female students attending schools in the most deprived areas, and virtually disappeared in schools in the least deprived areas (Figure 158).

Daily smoking rates declined for students of all socioeconomic groups during 1999–2013. The percent of students smoking daily decreased from 23.5% in 1999 to 6.8% in 2013 among those attending schools in the most deprived areas, from 16.2% to 3.7% for students at schools in average areas, and from 11.8% to 1.6% for students from schools in the least deprived areas.



Figure 158. Percentage of Year 10 students who were daily smokers by gender and school socioeconomic decile, New Zealand 1999–2013



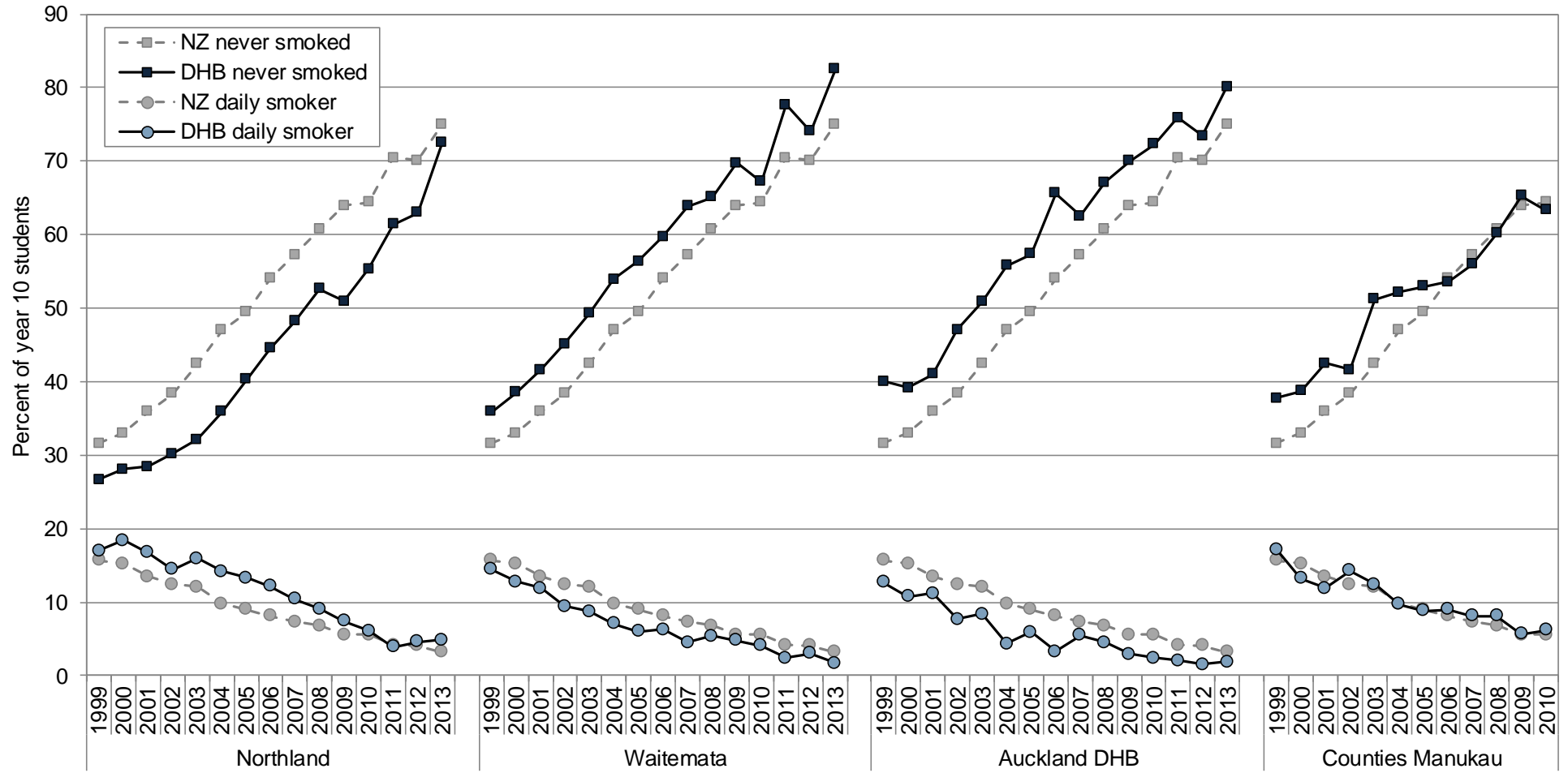
Source: ASH Year 10 surveys

Northern DHBs Distribution and Trends

In all four of the Northern DHBs during 1999–2013, the proportion of Year 10 students who had never smoked increased, while the proportion who were daily smokers declined. During this period, daily smoking rates in Northland were generally higher than the New Zealand rate, while in the Waitemata and Auckland DHBs rates were generally lower. Daily smoking rates in Counties Manukau were similar to the New Zealand rate (**Figure 159**).



Figure 159. Percentage of Year 10 students who were daily smokers vs. never smoked, Northern DHBs vs. New Zealand, 1999–2013



Source: ASH Year 10 surveys

New Zealand Health Survey 2012/13

The New Zealand Health Survey provides a snapshot of the health of the New Zealand population, including children and young people. The NZ health survey utilises face-to-face questionnaires to sample approximately 13,000 adults and 4,000 children [335]. This section summarises presents the smoking behaviour of young people aged 15–24 years.

Data Source and Methods

Indicator
Daily smoking among young people aged 15–24 years (smokes daily and has ever smoked more than 100 cigarettes)

Data source: New Zealand Health Surveys 2011/12 and 2012/13

Numerator: Number of young people aged 15–24 years who are daily smokers

Denominator: Percent of adults aged 15 years and older

Notes on Interpretation

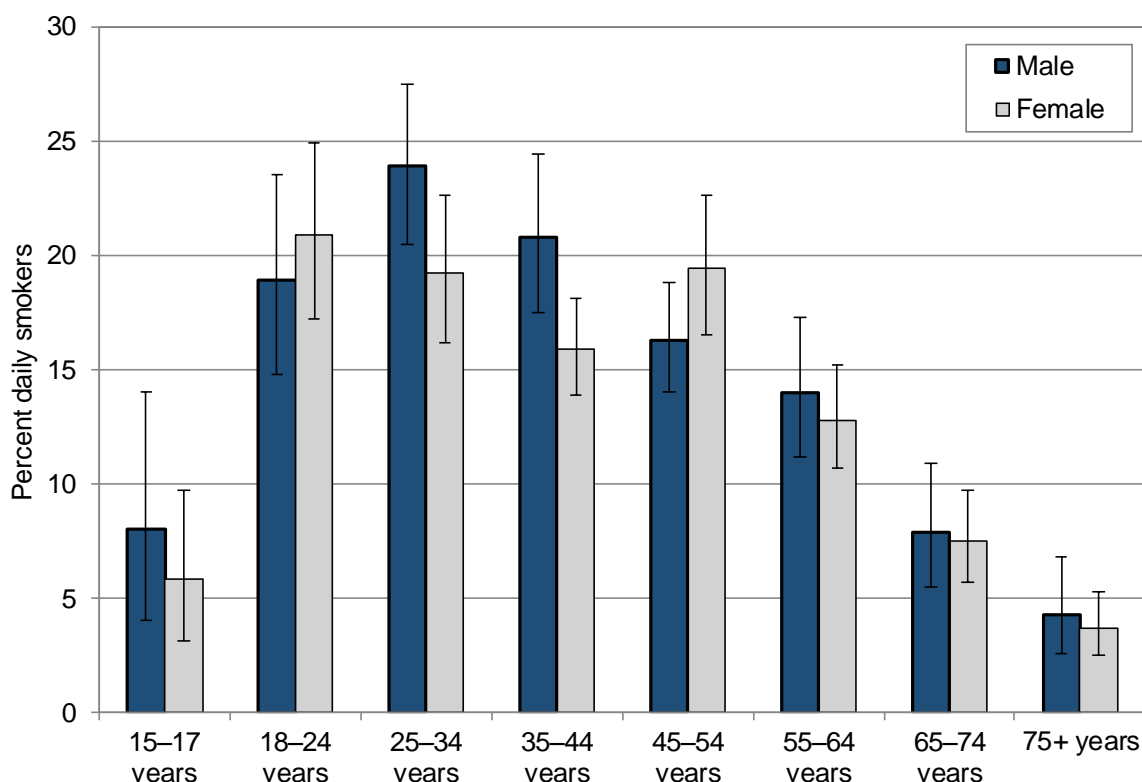
Note 1: the NZ Health Survey 2012/13 utilised face-to-face interviews to sample 13,009 adults and the parents/caregivers of 4,485 children during the period 1 July 2012 to 30 June 2013.

Note 2: The survey results refer to the usually resident population of all ages living in permanent dwellings, aged-care facilities and student accommodation. Those not included in the survey were: people living in institutions (such as for long-term hospital care, hospital- and dementia-level care in aged-care facilities, and in prisons), the homeless, short-term visitors and tourists [335].

New Zealand Distribution and Trends

Smoking rates remain low in youths and are declining in young adults (**Figure 160**) [335]. In 2012/13, the unadjusted daily smoking rate for 15–17-year-olds was 6.5% in 2011/12 and 7% for 2012/13 [335]. The unadjusted daily smoking rate among adults aged 18–24 years had *decreased significantly* from 24.4% in 2011/12 to 19.8% in 2012/13 ($p=0.04$) (**Figure 161**) [335].

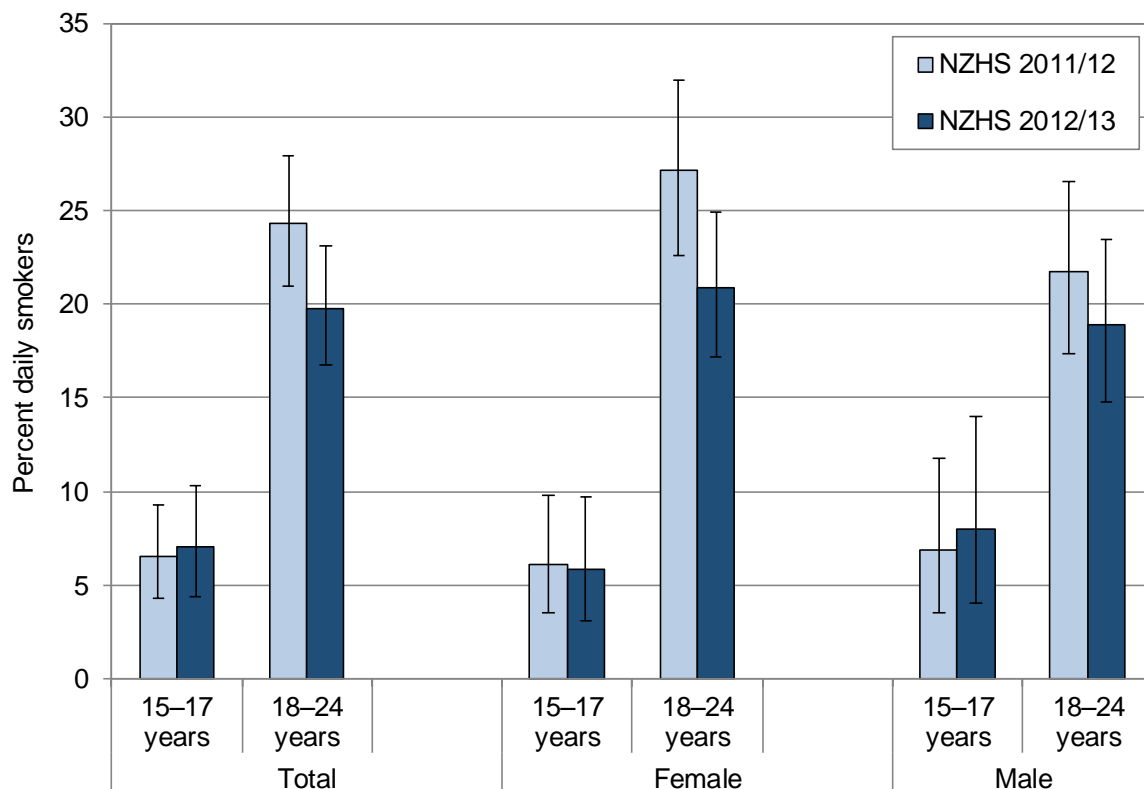
Figure 160. Percentage of population who are daily smokers by age-group and gender, New Zealand Health Survey 2012/13



Source: New Zealand Health Survey 2012/13 [335]



Figure 161. Percentage of young people aged 15–24 years who are daily smokers by age-group and gender, New Zealand Health Surveys 2011/12 and 2012/13



Source: New Zealand Health Surveys

Local Policy Documents and Evidence Based Reviews Relevant to the Prevention of Smoking in Young People

In New Zealand, there is no national strategy focused on the prevention of youth smoking. There are several policy documents addressing the prevention or cessation of cigarette smoking in general. In addition, a large number of evidence-based reviews consider smoking prevention and cessation in adolescents. **Table 58** (below) provides an overview of local policy documents and evidence-based reviews addressing the prevention of smoking in young people, and **Table 59** (page 323) addresses smoking cessation. **Table 52** (page 294) summarises publications addressing the cessation of smoking in pregnancy, and **Table 55** (page 304) summarises publications which consider the prevention of exposure to second-hand cigarette smoke in children.



Table 58. Local policy documents and evidence based reviews relevant to the prevention of smoking in young people

Ministry of Health publications
<p>Ministry of Health. 2012. Guidelines for Implementing the Prohibition on the Display of Tobacco Products 2012: Information for sellers of tobacco products and Smoke-free Enforcement Officers. Wellington: Ministry of Health. http://www.health.govt.nz/publication/guidelines-implementing-prohibition-display-tobacco-products</p> <p>These guidelines provide information to sellers of tobacco products to ensure that they understand the new obligations that were placed on them when the prohibition on tobacco displays came into force on 23 July 2012 following the passing of the Smoke-free Environments (Controls and Enforcement) Amendment Act 2011. The law introduced a complete ban on the display of tobacco products.</p>
International guidelines
<p>National Institute for Health and Care Excellence. 2010. School-based interventions to prevent smoking (PH 23). London: National Institute for Health and Care Excellence. http://publications.nice.org.uk/school-based-interventions-to-prevent-smoking-ph23</p> <p>This concise guidance on school-based smoking prevention interventions provides recommendations relating to organisation-wide or whole-school approaches, adult-led interventions, peer-led interventions, staff training and development, and having a coordinated approach. The recommendations cover: the target population, the people who should take action, and the actions they should take. Evidence statements for the recommendations are not included in the main text but can be found in appendix C. The supporting documents on which the guidance was based can be found in appendix E, which is not included in the downloadable PDF version of the guidance, but can be found at: http://guidance.nice.org.uk/PH23/SupportingEvidence .</p>
<p>National Institute for Health and Care Excellence. 2008. Preventing the uptake of smoking by children and young people (PH14). London: National Institute for Health and Care Excellence. http://publications.nice.org.uk/preventing-the-uptake-of-smoking-by-children-and-young-people-ph14/introduction</p> <p>This guidance focused particularly on mass-media and point-of-sale measures to prevent the uptake of smoking by children and young people. It intended for a wide audience: those in the health sector, the criminal justice system, local authorities, and the wider public, voluntary and community sectors, as well as those working in retail or the mass media. The mass-media recommendations cover campaign development, campaign messages and campaign strategies, and the point-of-sale recommendations cover illegal and under-age sales. Evidence statements for the recommendations are not included in the main text but can be found in appendix C. Links to the supporting evidence for the guideline (appendix E), which is not included in the downloadable PDF version of the guidance, can be found at: http://guidance.nice.org.uk/PH14/SupportingEvidence.</p>
Evidence-based medicine reviews
<p>Thomas RE, McLellan J, Perera R. 2013 School-based programmes for preventing smoking. Cochrane Database of Systematic Reviews, 4, DOI: 10.1002/14651858.CD001293.pub3. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001293.pub3/abstract</p> <p>This review included 134 RCTs involving 428,293 participants aged 5–18 years. The review authors considered the studies in three groups: “pure prevention cohort”, “change in smoking behaviour” and “point prevalence of smoking”. Pooled results of the 49 “pure prevention” studies (142,447 participants) indicated no overall effect of the intervention at one year or less: odds ratio (OR) 0.94, 95% CI 0.85–1.05, but a significant effect at longest follow-up: OR 0.88, 95% CI 0.82–0.96, indicating a 12% absolute reduction in starting smoking in the intervention groups. Sub-group analyses indicated that programmes that combined a social competence with a social influence approach were more effective, both at 12 months (six trials/seven arms, OR 0.49, 95% CI 0.28–0.87), and at longest follow-up (eight cluster-RCTs/10 arms, OR 0.50, 95% CI 0.28–0.87), while there was a significant effect of social competence curricula only at longest follow up (OR 0.52, 95% CI 0.30–0.88). Studies that used social influences programmes, multimodal interventions or information-only approaches found no overall effect at any time point. Fifteen cluster RCTs (45,555 participants) reported on change in smoking behaviour. Their results indicated no overall effect at longest follow up and a small, but statistically significant effect in favour of the controls at 12 month follow up, however there were positive findings for social competence and combined social competence and social influences interventions. Twenty-five studies reported data on point prevalence of smoking. Due to heterogeneity their data could not be pooled.</p>
<p>Thomas RE, Lorenzetti DL, Spragins W. 2013. Systematic Review of Mentoring to Prevent or Reduce Tobacco Use by Adolescents. Academic pediatrics, 13(4), 300–07.</p> <p>Mentoring has been defined as: “A personal relationship in which a caring individual provides consistent companionship, support, and guidance aimed at developing the competence and character of a child or adolescent” [353]. This review identified four RCTs, two focusing exclusively on tobacco, and the other on both tobacco and drug use reductions. Only one study, of mentoring by peers in UK year 8 students, reduced adolescent smoking. The other three studies were underpowered, with the largest having fewer than 200 participants. The review authors concluded that, at best, modest effects can be expected from mentoring programmes that train and monitor mentors and have carefully structured interventions. They stated that further research is needed.</p>

U.S Department of Health and Human Services. 2012. **Preventing tobacco use among youth and young adults: A report of the Surgeon General.** Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. http://www.cdc.gov/tobacco/data_statistics/sgr/2012/index.htm

This report includes an extensive review of the effectiveness of interventions to promote smoking cessation in adolescents. Cognitive behavioural strategies and achieving sufficient dosage of programming (number of sessions) appeared to be important. There was little evidence of the efficacy of pharmacological adjuncts in youth smoking cessation and gaps in the evidence include longer term follow up and how to effectively recruit young smokers to intervention programmes.

Patnode C D, O'Connor E, Whitlock E P, et al. 2012. **Primary Care Relevant Interventions for Tobacco Use Prevention and Cessation in Children and Adolescents: A Systematic Evidence Review for the U.S. Preventive Services Task Force. Evidence Synthesis No. 97. AHRQ Publication No. 12-05175-EF-1.** Rockville, MD: Agency for Healthcare Research and Quality. <http://www.ncbi.nlm.nih.gov/books/NBK114973/>

This review included 19 controlled trials of interventions designed to prevent smoking uptake and/or encourage smoking cessation in young people that were conducted in, or potentially feasible for (or referable from), health care settings and that reported tobacco use prevalence or a similar outcome at least six months after the intervention. Almost all the trials were conducted in the US. The intervention components and settings were very heterogeneous. Seven fair quality trials evaluated combined prevention and cessation interventions. A pooled analysis of the data from six of them (8,749 participants) indicated a non-significant difference in smoking prevalence between the intervention and the control group at 6–12 months follow up. Pooled analysis of data from the nine suitable prevention trials (26,624 participants) suggested a small reduction in smoking initiation at 6–12 months: (risk ratio, 0.81; 95% CI 0.70–0.93). The review authors stated that: "Overall, methodological differences between the included trials limits our ability to determine if the relatively small effect found on smoking initiation in this subset of trials represents true benefit across this body of literature. In particular, the measurement of smoking status, including what constituted smoking initiation and cessation, varied across all studies. In addition, the diversity of both the components and the intensity of the interventions limit our ability to draw conclusions about common efficacious elements".

Johnston V, Liberato S, Thomas D. 2012. **Incentives for preventing smoking in children and adolescents.** Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD008645.pub2
<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD008645.pub2/abstract>

The authors of this review identified seven controlled trials meeting their inclusion criteria, with participants aged 11–14 years. All except one were trials of the "Smokefree Class Competition" (SFC), which was co-funded by the European Commission from 1997–2009 and carried out in 22 European countries. The school-based competition involves classes of young people generally aged 11–14 who commit to being smoke-free for six months. They report regularly on their progress and if 90% or more of the class is non-smoking at six months the class enters a draw to win prizes. Only five SFC trials had data that could be used in meta-analysis (3 RCTs and 2 non-randomised controlled trials). Pooled data from the three RCTs (1,108 participants) indicated no significant long term effect of incentives on smoking uptake at longest follow-up: RR 1.00, 95% CI 0.84–1.19. Pooled results from the two non-randomised trials (1,025 participants) also indicated no significant effect: RR 0.81, 95% CI 0.61–1.08. The review authors were unable to extract data on smoking status of young people who reported not smoking at baseline from the one trial that did not study the SFC. They stated that there was little robust evidence to indicate unintended consequences of these interventions, such as bullying of smoking students or students lying about their smoking status, although this had not been the focus of much research. They concluded that, to date, incentives have not been shown to prevent smoking uptake in young people as there have been relatively few studies in this area and they have been of variable quality.

Carson KV, et al. 2012. **Interventions for tobacco use prevention in Indigenous youth.** Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD009325.pub2
<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD009325.pub2/abstract>

This review assessed the effectiveness of intervention programmes to prevent tobacco use initiation or progression to regular smoking amongst young indigenous populations. Two RCTs (1,505 participants) met inclusion criteria. Both studies were based in Native American populations and employed multi-component community-based interventions tailored to the specific cultural aspects of the population. No difference was observed in weekly smoking at 42 months follow up in the one study assessing this outcome (skills-community group versus control: RR 0.95, 95% CI 0.78–1.14; skills only group versus control: RR 0.86, 95% CI 0.71–1.05). Positive change found in the second study at post-test was not maintained at six month follow up. Given the paucity of evidence the authors concluded that methodologically rigorous trials are needed to investigate interventions aimed at preventing the uptake of tobacco use amongst indigenous youth and to assist in bridging the gap between tobacco-related health disparities in indigenous and non-indigenous populations.

Lovato C, et al. 2011. **Impact of tobacco advertising and promotion on increasing adolescent smoking behaviours.** Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD003439.pub2
<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD003439.pub2/abstract>

This review identified 19 longitudinal studies that assessed individuals' smoking behaviour and exposure to advertising, receptivity or attitudes to tobacco advertising, or brand awareness at baseline, and assessed smoking behaviour at follow ups. The studies followed over 29,000 baseline non-smokers aged 18 and under. In 18 of studies participants who were more aware of or receptive to tobacco advertising, were more likely to have experimented with cigarettes or become smokers at follow up, supporting a causal link between advertising and tobacco use in young people.

Carson KV, et al. 2011. **Community interventions for preventing smoking in young people.** Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD001291.pub2
<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001291.pub2/abstract>

This 2011 update reviewed trials comparing the effectiveness of multi-component community interventions with single component or school-based only interventions in influencing smoking behaviour in young people, including preventing uptake. The interventions used co-ordinated, widespread, multi-component programmes which aimed to influence behaviour. The programmes included education of retailers, mass media, school and family-based components, and there was often community involvement in planning and/or implementation. Twenty-five studies (15 RCTs and 10 non-randomised controlled trials) were included in the review. Ten of them were associated with a reduction in smoking uptake in the intervention group. Changes in intentions to smoke, knowledge, attitudes and perceptions about smoking did not generally appear to affect long-term smoking behaviour. Overall there was some evidence to support the effectiveness of community interventions but the review authors stated that the evidence was not strong and had a number of methodological flaws. The authors identified the strong influence of local factors and likely difficulties with replication of interventions but suggested the principles and methods on which successful interventions are based may be useful in programme implementation in similar settings.

Brinn MP, et al. 2010. **Mass media interventions for preventing smoking in young people.** Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD001006.pub2
<http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD001006/frame.html>

This updated review evaluated the effectiveness of mass media interventions to prevent smoking in young people. The primary outcome was reduced smoking uptake, and secondary outcomes included improved attitudes and behaviours. Seven controlled trials (approximately 49,398 participants) met the inclusion criteria. Three studies reported a reduction in smoking behaviour in young people. Common features of successful campaigns included using multiple channels for media delivery, combining school and media interventions and repeated exposure to campaign messages delivered to the same cohort of students over a minimum of three years. The authors stated that the evidence for mass media campaigns aimed at young people was not strong and had a number of methodological flaws. They offered recommendations for planning and evaluating future campaigns.

Uthman O, Yahaya I, Pennant M, et al. 2009. **School-based interventions to prevent the uptake of smoking among children and young people: effectiveness review.** Birmingham: West Midlands Health Technology Assessment Collaboration, University of Birmingham <http://www.nice.org.uk/nicemedia/live/12827/47624/47624.pdf>

This rapid review was used to develop the NICE guidance above. It includes 64 RCTs published between 1990 and November 2008, investigating a wide variety of school-based interventions and reporting various smoking outcomes. The review found that there was evidence that interventions may be effective but the authors noted that the studies which found the greatest effect of an intervention tended to be of lower quality. The review found no clear evidence to suggest that any particular conceptual model is more effective than any other conceptual model intervention compared to usual education. There was moderate evidence from five RCTs indicating that multi-component interventions with both school and community components, with or without an additional family component, were ineffective at preventing smoking uptake compared to usual education. The evidence on the effectiveness of interventions with both school and family components in preventing smoking uptake compared to usual education was inconclusive, as was the evidence on whether school-based programmes were delaying rather than preventing smoking. There was no robust evidence that school-based interventions have long-lasting effects beyond school leaving age. It was unclear whether the status of the person delivering the intervention affected effectiveness. Intervention effectiveness did vary with location in a number of studies but not in a consistent way. There was clear evidence that booster session enhanced effectiveness of main programmes. There was no clear evidence that age of students at intervention or at follow-up affected effectiveness. There was limited evidence on adverse effects of interventions as no studies specifically examined adverse or unintentional effects but two studies found students exposed to interventions were more likely to smoke.

Stead LF & Lancaster T. 2008. **Interventions for preventing tobacco sales to minors.** Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD001497.pub2
<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD001497.pub2/abstract>

This review assessed the effect of interventions aimed at reducing underage access to tobacco by deterring retailers from making illegal sales. Outcomes included both changes in retailer compliance assessed by test purchasing, and changes in young people's smoking behaviour and their perceived ease of access. Thirty-five studies, fourteen of which had a control group, were included in the review. Active enforcement and/or multi-component educational strategies were more effective than information for retailers alone. While sales were reduced, none of the communities studied achieved complete, sustained compliance. Data from three trials indicated little evidence for an effect of retailer interventions on youth perceptions of ease of access to tobacco, or on smoking behaviour.

Richardson L, Allen P, McCoullough L, et al. 2008. **NICE Rapid Review: Interventions to prevent the uptake of smoking in children and young people.** Vancouver: British Columbia Centre of Excellence for Women's Health.
<http://www.nice.org.uk/nicemedia/live/12020/41335/41335.pdf>

This review, which was used to develop the NICE guidance above, examines the effectiveness of (a) mass media interventions designed to prevent the uptake of smoking in children and young people and (b) interventions designed to prevent the illegal sale of tobacco to children and young people. It is based on a review of 60 studies (40 on mass media and 20 on access restrictions) that were identified as being relevant, as well as interviews with key informants. Included studies were of various types: RCTs, meta-analyses, systematic reviews, case-control studies, cohort studies, controlled before-and-after studies, interrupted time series studies, qualitative studies and cross sectional studies.

Other relevant publications

Gray RJ, Hoek J, Edwards R. 2014. **A qualitative analysis of 'informed choice' among young adult smokers.** Tobacco Control. <http://tobaccocontrol.bmj.com/content/early/2014/09/10/tobaccocontrol-2014-051793.abstract>

This paper reports on a qualitative New Zealand study which involved in-depth interviews with fifteen young adults who had started smoking since turning 18 and therefore might be considered to have made an "adult choice" to smoke. The study found that although the study participants knew that smoking is generally harmful and were aware of some specific risks, they rarely considered these risks to be personally relevant when they started smoking, and few had made a deliberate decision to become smokers. Because they had a poor understanding of addiction, most believed that their smoking was a short term phase that they could stop at will. Participants typically began smoking in situations which discouraged informed choice, such as when they had been drinking or were in socially pressured situations. The researchers conclude that cognitive and contextual factors limited young adults' ability to make an "informed choice" at the time they began smoking. They proposed an updated informed choice framework that recognised these factors and suggested that measures to dissociate smoking from alcohol consumption such as restricting smoking in outdoor bar areas and restricting tobacco sales in alcohol outlets could be useful as well as reframing public health messages to make the risks of smoking appear more immediate and use affective rather than cognitive arguments, such as implying that smoking undermines a young adult's desire for control over their lives and self-assertion.

Marck K, Glover M, Kira A, et al. 2014. **Protecting children from taking up smoking: parents' views on what would help.** Health Promotion Journal of Australia, 25(1), 59–64. <http://www.publish.csiro.au/paper/HE13029>

This study investigated the opinions of the parents of children in low-income areas of Auckland on factors which could help prevent their children from taking up smoking, using a free text section in a questionnaire. There were 1806 parents who filled in this section, 70% of those who returned the questionnaire. Most respondents (80%) were Māori or Pacific mothers and 25% were smokers. The parents' suggestions fell into five main categories: increasing children's knowledge of the harms of smoking, denormalising smoking, reducing access to tobacco, building children's resilience, and health promotion activities. The most common suggestion was to inform children about the risk of smoking.

Virginia A. Moyer and on behalf of the U.S. Preventive Services Task Force. 2013. **Primary Care Interventions to Prevent Tobacco Use in Children and Adolescents: U.S. Preventive Services Task Force Recommendation Statement.** Pediatrics doi:10.1542/peds.2013-2079
<http://pediatrics.aappublications.org/content/early/2013/08/20/peds.2013-2079.full.pdf>

This recommendation statement from the USPSTF is based on the systematic review by Patnode et al. (above). The USPSTF found that there was adequate evidence that behavioural counselling interventions, such as face-to-face or phone interaction with a health provider, print materials, and computer applications, can reduce the risk of starting smoking in school-aged children and adolescents. They recommend that primary care clinicians provide smoking prevention interventions, including education or brief counselling (a B grade recommendation).

Bauld L, Branding J, Templeton L. 2009. **Facilitators and barriers to the delivery of school-based interventions to prevent the uptake of smoking among children: A systematic review of qualitative research.** Bath: UK Centre for Tobacco Control Studies. <http://www.nice.org.uk/nicemedia/live/12827/47627/47627.pdf>

This qualitative review was used to inform the NICE guidance above. It is based on a review of 21 qualitative studies of variable quality. Findings are grouped into six themes: delivery context of the intervention, characteristics of the young people receiving the intervention, peer interventions, delivery mechanisms, smokefree schools, and programme content. For each theme, facilitator and barriers are identified.

Note: The publications listed above were identified using the search methodology outlines in **Appendix 1**

Table 59. Local policy documents and evidence-based reviews relevant to smoking cessation in young people

Ministry of Health publications
<p>Ministry of Health. 2014. The New Zealand Guidelines for Helping People to Stop Smoking. Wellington: Ministry of Health. http://www.health.govt.nz/publication/new-zealand-guidelines-helping-people-stop-smoking</p> <p>These brief, 6-page guidelines are intended for frontline health workers and are an update of the 2007 New Zealand Smoking Cessation Guidelines. They state that all health care workers, regardless of their location, specialty or seniority, have a responsibility to help people who want to stop smoking. They are structured around the ABC pathway: Ask about smoking status, give Brief advice to stop smoking, and encourage smokers to use Cessation support and offer to help them access it. Further information supporting the recommendations can be found in Background and Recommendations of The New Zealand Guidelines for Helping People to Stop Smoking document (see below).</p>
<p>Ministry of Health. 2014. Background and Recommendations of the New Zealand Guidelines for Helping People to Stop Smoking. Wellington: Ministry of Health. http://www.health.govt.nz/system/files/documents/publications/background-and-recommendations-of-the_new-zealand-guidelines-for-helping-people-to-stop-smoking.pdf</p> <p>The recommendations and supporting information in this document are based on a 2013 review by West et al. for the UKCTAS on the effectiveness and affordability of interventions for smoking cessation, together with information from the literature review for the 2007 New Zealand Guidelines. Each recommendation is graded according to the system developed by the Australian NHMRC.</p>
<p>Ministry of Health. 2014. Guide to Prescribing Nicotine Replacement Therapy (NRT). Wellington: Ministry of Health. http://www.health.govt.nz/system/files/documents/publications/guide-to-prescribing-nrt-jun14.pdf</p> <p>This brief publication outlines the process for prescribing nicotine replacement therapy (NRT). It includes the questions health care workers should ask their patients or clients and the dosage different patients or clients should be prescribed. It also shows the right way to fill out a Quit Card (which patients or clients can use to get subsidised NRT).</p>
<p>Ministry of Health. 2014. The ABC Pathway: Key messages for frontline health care workers. Wellington: Ministry of Health. http://www.health.govt.nz/system/files/documents/publications/abc-pathway-for-frontline-health-care-workers-jun14.pdf</p> <p>This document is intended frontline health workers. It provides key messages about the “ABC” approach for helping people stop smoking. In addition to “general messages”, it provides key messages for maternity services, mental health services, emergency departments, surgical services and cancer services.</p>
Evidence-based medicine reviews
<p>Stanton A, Grimshaw G. 2013. Tobacco cessation interventions for young people. Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD003289.pub5 http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD003289.pub5/abstract</p> <p>This review aimed to evaluate the effectiveness of interventions for smoking cessation in young people. It included 20 trials involving regular smokers aged < 20 years (14 RCTs, 12 cluster RCTs and 2 controlled trials). Many interventions included multiple components from various theoretical backgrounds. The majority used some form of motivational enhancement together with psychological support such as cognitive behavioural therapy (CBT). Some were tailored to stage of change using the trans-theoretical model (TTM). The three trials based mainly on TTM interventions (1,662 participants) had a pooled risk ratio (RR) of 1.56 at one year (95% CI 1.21–2.01). Meta-analysis of the 12 trials (2,667 participants) that included motivational enhancement gave an estimated risk ratio (RR) of 1.60 (95% CI 1.28–2.01) at six months or more. The results of the 13 trials of complex interventions that included CBT could not be pooled due to clinical heterogeneity. Individually, none of them achieved statistically significant results. Pooling the results of six studies of the Not on Tobacco programme gave a marginally significant result: (RR of 1.31, 95% CI 1.01–1.71) although the review authors noted that in three of these trials abstinence for as little as 24 hours at six months was considered a positive outcome. One small trial of nicotine replacement therapy and two trials of bupropion did not find significant effects. The authors concluded that complex approaches were promising, especially those that incorporated elements sensitive to stage of change and used CBT and motivational enhancement. They stated that there is not yet sufficient evidence to recommend any one particular model and that further research is needed to provide better data on sustained quitting.</p>
<p>Civljak M, Stead Lindsay F, Hartmann-Boyce J, et al. 2013. Internet-based interventions for smoking cessation. Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD007078.pub4 http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD007078.pub4/abstract</p> <p>This review included 28 studies with over 45,000 participants (RCTs and quasi-RCTs). Fifteen trials compared an Internet intervention to either a non-Internet smoking cessation intervention or no intervention. Ten involved adults, one young adult university students and two, adolescents. Neither of the two small trials in adolescents detected an effect of the intervention. A post-hoc analysis, which pooled results from three trials in adults (3,631 participants) comparing an interactive tailored Internet intervention with usual care or printed self-help material, indicated a statistically significant effect in favour of the intervention: risk ratio (RR) 1.41, 95% CI 1.11–1.78, but all three trials were judged to be at high risk of bias in one domain, and all measured self-reported smoking as the outcome.</p> <p>Pooled results of two studies (686 participants) comparing an interactive Internet intervention that included automated phone contact with non-active control also indicated a significant effect: RR 2.05, 95% CI 1.42–2.97. None of the other trials comparing an Internet intervention to a non-Internet intervention or no intervention found a significant effect on</p>

smoking cessation.

Fourteen trials, all in adults, compared different Internet interventions. Meta-analysis was possible for three trials which compared a tailored and/or interactive Internet programme with a non-tailored, non-interactive Internet programme and the results indicated no beneficial effect: RR 1.12, 95% CI 0.95–1.32. One trial found evidence of a benefit from a tailored email compared to a non-tailored one but another compared tailored messages to non-tailored messages and found no effect. Trials failed to detect a benefit from including a mood-management component or adding an asynchronous bulletin board.

The review authors concluded that Internet-based intervention can help people to quit smoking at six months or more, especially if they are interactive and tailored to individuals but that the trials that compared Internet interventions with usual care or self-help had inconsistent results and were at risk of bias. They stated that further research is needed.

Thomas RE, Lorenzetti DL, Spragins W. 2013. **Systematic Review of Mentoring to Prevent or Reduce Tobacco Use by Adolescents.** *Academic pediatrics*, 13(4), 300–07.

Mentoring has been defined as: “A personal relationship in which a caring individual provides consistent companionship, support, and guidance aimed at developing the competence and character of a child or adolescent” [353]. This review identified four RCTs, two focusing exclusively on tobacco, and the other on both tobacco and drug use reductions. Only one study, of mentoring by peers in UK year 8 students, reduced adolescent smoking. The other three studies were underpowered, with the largest having fewer than 200 participants. The review authors concluded that, at best, modest effects can be expected from mentoring programmes that train and monitor mentors and have carefully structured interventions. They stated that further research is needed.

Patnode C D, O'Connor E, Whitlock E P, et al. 2012. **Primary Care Relevant Interventions for Tobacco Use Prevention and Cessation in Children and Adolescents: A Systematic Evidence Review for the U.S. Preventive Services Task Force. Evidence Synthesis No. 97. AHRQ Publication No. 12-05175-EF-1.** Rockville, MD: Agency for Healthcare Research and Quality. <http://www.ncbi.nlm.nih.gov/books/NBK114973/>

This review included 19 controlled trials of interventions designed to prevent smoking uptake and/or encourage smoking cessation in young people that were conducted in, or potentially feasible for (or referable from) health care settings and that reported tobacco use prevalence or a similar outcome at least six months after the intervention. Almost all the trials were conducted in the US. The intervention components and settings were very heterogeneous. Seven fair quality trials evaluated combined prevention and cessation interventions. A pooled analysis of the data from six of them (8,749 participants) indicated a non-significant difference in smoking prevalence between the intervention and the control group at 6–12 months follow up. Meta-analysis of data from seven behaviour-based cessation trials (2,328 participants) and from the two cessation trials of medication (bupropion, 256 participants) did not show a statistically significant effect on self-reported smoking status in baseline smokers at 6–12 months follow up. None of the trials of behaviour-based interventions reported on harms of treatment although some trials reported a non-significant increase in smoking prevalence after the intervention. Three bupropion trials did report on harm (the two that were included in the meta-analysis of benefits plus an additional trial that did not meet the criteria for meta-analysis because it only reported outcomes at six weeks) and findings were mixed. The review authors stated that definitions of smoking initiation and cessation varied between studies, and this, together with the diversity of both components and intensity across the interventions limited their ability to draw conclusions about common efficacious elements.

Carson KV, et al. 2012. **Interventions for smoking cessation in Indigenous populations.** *Cochrane Database of Systematic Reviews* doi:10.1002/14651858.CD009046.pub2
<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD009046.pub2/abstract>

This review sought to evaluate the effectiveness of smoking cessation interventions in indigenous populations, who carry a disproportionate burden of smoking-related morbidity and mortality. Four studies met eligibility criteria, two of which were New Zealand studies (mobile phone text messaging and bupropion, both in adults), highlighting the paucity of available evidence. The limited available evidence reported indicated that smoking cessation interventions specifically targeted at Indigenous populations can produce smoking abstinence but that further research is needed.

Kim Y, Myung SK, Jeon YJ, et al. 2011. **Effectiveness of pharmacologic therapy for smoking cessation in adolescent smokers: Meta-analysis of randomized controlled trials.** *Am J Health Syst Pharm*, 68(3), 219–26

This meta-analysis evaluating the effectiveness of pharmacologic therapy (bupropion and nicotine replacement therapy) for smoking cessation in adolescent smokers included six RCTs, involving 816 smokers aged 12–20 years. No significant increase in abstinence rates was detected with pharmacologic therapy (RR 1.38, 95% CI 0.92–2.07). Subgroup meta-analysis found no significant increases in abstinence rates in short-term (≤ 12 weeks) or mid-term (26 weeks) follow-up. Few adverse events were reported. While current evidence does not support the effectiveness of pharmacologic interventions for adolescents, the authors note the small number of trials and participants. This review was assessed by the CRD who noted that none of the trials appeared adequately powered to detect a difference in smoking cessation rates. The CRD stated: “Overall, this review had some methodological problems and the limitations of the included studies should be borne in mind when interpreting the authors’ conclusions”. The CRD is at: <http://www.crd.york.ac.uk/CRDWeb/ShowRecord.asp?AccessionNumber=12011002839&UserID=0#.U5-bxPmSx8E>

Bryant J, et al. 2011. **A systematic review and meta-analysis of the effectiveness of behavioural smoking cessation interventions in selected disadvantaged groups.** *Addiction*, 106(9), 1568–85.

This review assessed the effectiveness of behavioural interventions (including verbal advice, self-help, incentives and psychological interventions) in disadvantaged groups. Meta-analysis of four studies of behavioural interventions for at-risk youth did not reveal a significant effect on smoking cessation, (RR 1.55, CI 0.74–3.26) but sample sizes and the number of well-controlled RCTs pooled for analysis were small.

Heckman CJ, et al. 2010. **Efficacy of motivational interviewing for smoking cessation: a systematic review and meta-analysis.** *Tobacco Control*, 19(5), 410–16.

This systematic review and meta-analysis of interventions incorporating motivational interviewing (MI) for smoking cessation identified 31 trials, including eight trials in adolescents. The meta-analysis of all 31 trials (9,485 individual participants) showed an overall odds ratio (OR) comparing likelihood of abstinence in the MI versus control condition of 1.45 (95% CI 1.14–1.83). For adolescents the OR for the MI effect was 2.29 (95% CI 1.34–3.89), suggesting that current MI smoking cessation approaches can be effective for adolescents.

Sussman S & Sun P. 2009. **Youth tobacco use cessation: 2008 update.** *Tobacco Induced Diseases*, 5(1), 3.
<http://www.tobaccoinduceddiseases.com/content/5/1/3>

This updated empirical review included 64 controlled trials assessing teen smoking cessation interventions. Meta-analysis indicated an absolute difference in percentage of participants who quit of 4.26% in favour of the intervention groups compared to controls (an improvement on the value found in the 2006 meta-analysis of 48 studies: 2.90% absolute risk reduction). Studies using programmes based on social influences, cognitive-behavioural theory, or programming to enhance motivation were more effective and the strongest effects were found in classroom-based educational programs, school-based clinics, and computer-based programmes. Programmes consisting of at least 5 sessions were more effective.

Other relevant publications

Marsh L, Dawson A, McGee R. 2013. **What do young New Zealanders want in terms of smoking cessation?** *Journal of Smoking Cessation*. Available on CJO 2013 doi:10.1017/jsc.2013.30.

This study, which examines young New Zealander's views on what would help them quit smoking, is based on discussions with 10 focus groups involving 66 young smokers aged between 15 and 17 years, conducted in late 2011. Around half of the participants had tried to quit smoking and some had made multiple attempts using a variety of methods. They described both mental and physical difficulties with quitting. The young people's ideas on what would be helpful for quitting included having supportive people around them, making personal changes and adopting alternative behaviours to smoking, legislative changes and other ideas unique to young people.

Curry SJ, Mermelstein RJ, Emery SL, et al. 2013. **A national evaluation of community-based youth cessation programs: end of program and twelve-month outcomes.** *Am J Community Psychol*, 51(1–2), 15–29.
<http://link.springer.com/article/10.1007%2Fs10464-012-9496-8>

This paper reports on a longitudinal evaluation of a sample of 41 community-based youth smoking cessation programmes in the US. The evaluation aimed to identify the site, programme and participant characteristics associated with successful cessation. Most programmes were conducted in schools, used cognitive-behavioural components, and had, on average, nine sessions of about an hour each. About one third had some participants who had been mandated to attend and over 80% offered some kind of attendance incentive. Seventy-four percent of participants lived with a smoker, almost two-thirds reported binge drinking, one third reported having ADD or ADHD and 27% had depressive symptomatology. Across all programmes, the mean percentage of participants abstinent for at least seven days at the end of the program was 13.89% and the mean percentage abstinent for at least 30 days at 12-month follow-up was 12.49%. In the multivariate GEE model, factors that were significant predictors of 30 days abstinence at 12 months were: greater attendance at the program sessions; longer time to first cigarette after waking; father very supportive of quitting; starting the program with a strong intention to stick with it; participation in a program with only voluntary participants; and organizational leadership that is aware and supportive of the program. The study authors stated that their findings indicate the importance of both individual and community-level variables, including motivation, opportunities for and encouragement to engage in activities outside of academics, having youth participate in treatment before they become highly dependent smokers, and community norms and ordinances that discourage youth purchase, possession, and use of tobacco.

Cengelli S, O'Loughlin J, Lauzon B, et al. 2011. **A systematic review of longitudinal population-based studies on the predictors of smoking cessation in adolescent and young adult smokers.** *Tobacco Control*.
<http://tobaccocontrol.bmj.com/content/early/2011/08/13/tc.2011.044149.abstract>

This review aimed to describe the determinants of self-initiated smoking cessation (defined as quitting for at least six months) as identified in longitudinal population-based studies of adolescent and young adult smokers. The review authors identified nine relevant English-language studies, published between 1 January 1984 and 31 August 2010. All of the studies were school based. Participants ranged in age from 12–23 years at baseline and 14–29 years at final follow-up. There was considerable heterogeneity across the studies in definition and measurement of smoking status, and in the potential determinants of cessation investigated. Despite this, there were five factors that robustly predicted quitting across the studies which investigated the factor: not having friends who smoke, having an intention to quit in the future, resisting peer pressure to smoke, having negative beliefs about smoking, and being older when first smoking. The review authors concluded that their review did not provide a solid evidence base for developing smoking cessation interventions for adolescent and young adult smokers, but that in the meantime, until better evidence becomes available, practitioners may consider incorporating the results of this review in policies and interventions.

Note: The publications listed above were identified using the search methodology outlines in **Appendix 1**

ALCOHOL-RELATED HOSPITAL ADMISSIONS

Introduction

Alcohol is New Zealand's most widely used recreational drug. It causes harm through toxicity, intoxication and dependence. The way a person drinks is a key determinant of their risk of suffering harm from their alcohol consumption. Both intermittent heavy drinking (binge drinking) and frequent drinking episodes are hazardous to health and wellbeing [354]. Long term harm from excessive alcohol intake over many years includes conditions entirely attributable to alcohol, such as alcohol dependence syndrome and alcoholic liver disease. There are also more than 200 other diseases and conditions for which alcohol is a component cause in that it increases the risk of a person developing the condition via a dose-response relationship. These conditions include many types of cancer, depression, and dementia [355]. Short term risks associated with acute alcohol intoxication are often relevant to young people. These include injury, risky sexual behaviour leading to sexually transmitted infections and/or pregnancy, being the victim or perpetrator of assault or sexual violence and use of other psychoactive substances [356]. A 2011 systematic review of cohort studies found that there was consistent evidence that higher alcohol consumption in late adolescence (15–19 years) continues into adulthood and that it is associated with alcohol-related problems including dependence. There was not sufficient high quality evidence, however, to warrant making causal inferences on the broader health and social consequences of late adolescent drinking [357].

The latest New Zealand Health Survey (2012/13) found that a quarter of young people aged 15–24 years engaged in hazardous drinking, compared to 35% in the 2006/07 survey [335]. The Youth'12 survey, involving 8,500 secondary school students, also found improvements in drinking behaviour. In 2012, 23% of students reported binge drinking in the past four weeks compared to 34% in 2007 and 40% in 2001 [358]. The percentage binge reporting binge drinking, or ever having drunk alcohol, did not vary with deprivation but the proportion who reported currently drinking alcohol was somewhat higher in students in low deprivation areas [359]. The Youth '07 survey found significant variations by ethnic group in the proportion of students reporting binge drinking in the past four weeks: (Māori, 51.0%; Pacific, 27.0%; Asian, 14.4%; NZ European, 35.6%; Other, 26.2%) [360].

The following section explores alcohol-related hospital admissions in young people aged 15–24 years. This section serves to identify the tip of the iceberg in terms of the contribution alcohol makes to hospital admissions in this age group. Note however, the following analyses potentially are an undercount (due to regional variations in coding and the fact that many alcohol-related issues are dealt with in the ED setting: refer to Methods box).

Data Source and Methods

Indicator

1. *Alcohol-related hospital admissions in young people aged 15–24 years*

Numerator: National Minimum Dataset (NMDS): Hospital admissions with an ICD-10-AM alcohol-related diagnosis in any of their first 15 diagnostic codes (F10 mental and behavioural disorders due to alcohol, T51 toxic effects of alcohol) or first 10 external cause codes (X45 accidental poisoning by/ exposure to alcohol, X65 intentional self-poisoning by/exposure to alcohol, Y15 poisoning by/exposure to alcohol of undetermined intent, Y90–91 evidence of alcohol involvement determined by blood alcohol level or level of intoxication).

Denominator: Statistics NZ estimated resident population

Notes on Interpretation

Note 1: As alcohol is often coded as a secondary cause (e.g. in a traffic crash, alcohol will only be listed after the primary diagnosis (e.g. fractured femur) and external cause (e.g. vehicle occupant in transport accident) have been recorded), the following section includes all admissions where alcohol was listed in any of the first 15 diagnoses or 10 external causes of injury.



Note 2: It is likely that the figures presented reflect a considerable undercount as a result of regional differences in the extent to which:

- 1) clinicians document alcohol as a contributory cause of admission; or
- 2) coders code alcohol-related diagnoses over and above those associated with the primary diagnosis and first external cause of injury code.

In this context, a 2000 study of the role alcohol played in injury attendances at an Auckland emergency department noted 35% of injured patients had consumed alcohol prior to their injury [361]. In contrast, an analysis of New Zealand ED cases for the period 2000–2005 using the NMDS found that only 10.3% of injury cases in young people 15–24 years had any mention of alcohol, while 4.5% of injury cases admitted beyond the ED (the group reviewed in this section) had alcohol as a listed cause. This suggests that the figures in this section are likely to significantly underestimate the contribution alcohol makes to hospital admissions in this age group.

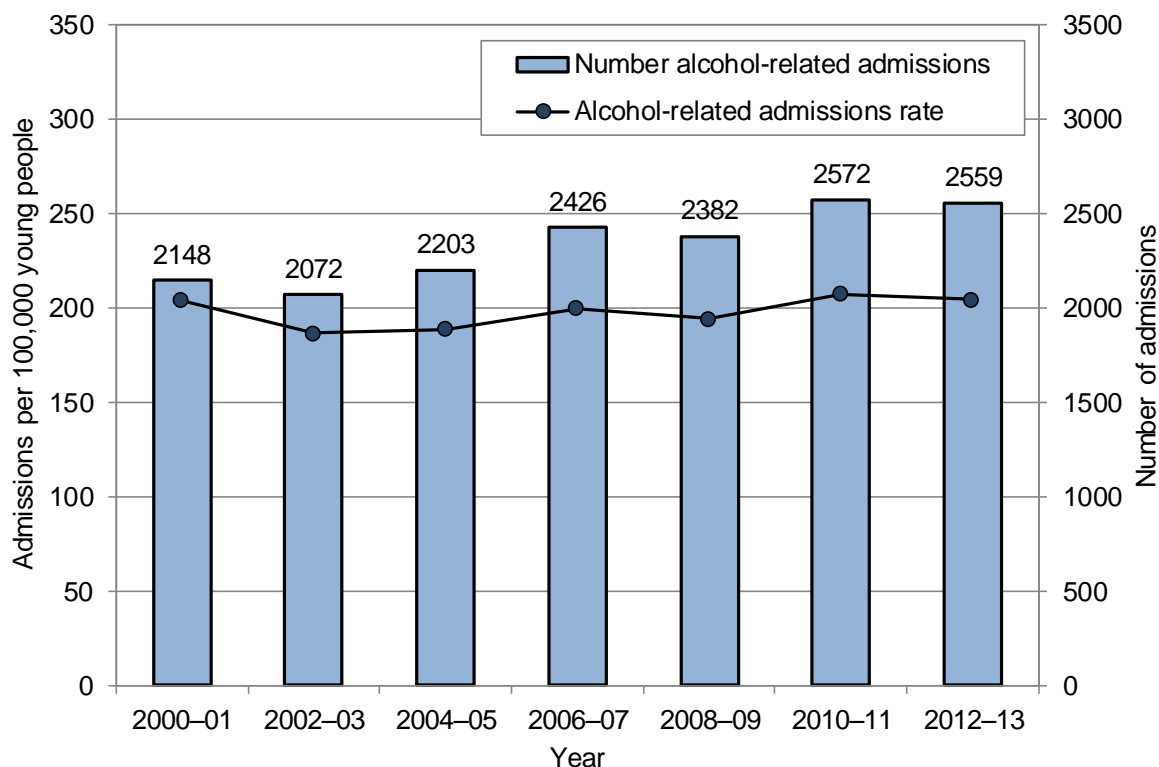
Note 3: Due to inconsistent uploading of ED cases to the NMDS, all admissions with an ED specialty code on discharge have been excluded (see **Appendix 3** for a more detailed discussion of this issue). While this filtering is likely to remove a large number of alcohol-related cases, it has been undertaken with a view to enhancing the comparability of admission rates across DHBs.

New Zealand Distribution and Trends

New Zealand Trends

In New Zealand during 2000–2013, alcohol-related hospital admissions in young people were relatively static. While on average 1,168 admissions occurred per year, it is likely that this reflects a significant undercount, as identification relies on hospital staff at the time of discharge listing alcohol as a contributory cause, as well as coders assigning alcohol-related diagnoses in cases where alcohol contributed to, but was not the sole reason for admission (**Figure 162**).

Figure 162. Alcohol-related hospital admissions in young people aged 15–24 years, New Zealand 2000–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population; Note: admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; emergency department cases removed; numbers are per 2-year period



New Zealand Distribution by Primary Diagnosis

In New Zealand during 2009–2013, alcohol was listed as a contributory cause in a large number of hospital admissions. However, only 8.6% of these admissions had acute intoxication or the toxic effects of alcohol listed as the primary diagnosis. In 47.4% of cases an injury was the primary diagnosis, with head and upper limb injuries playing a particularly prominent role.

In addition, 34.5% of admissions had a mental health condition (including alcohol dependence) listed as the primary diagnosis. Schizophrenia and depression/other mood disorders were the most frequent diagnoses recorded. Poisoning by drugs, medicines, or substances was listed as the primary reason in 11.9% of admissions (**Table 60**).

Care is required with interpreting these figures. As a result of inconsistent uploading of emergency department (ED) cases to the National Minimum Dataset, ED cases have been removed. These figures, therefore, reflect the more severe end of spectrum as it is likely that many cases of acute intoxication or minor injury were dealt with in the ED setting.

Table 60. Alcohol-related hospital admissions in young people aged 15–24 years by primary diagnosis, New Zealand 2009–2013

Primary diagnosis	Number: total 2009–2013	Number: annual average	Rate per 100,000	Percent of admissions
Young people aged 15–24 years				
Mental and behavioural disorders				
Alcohol: acute intoxication	444	88.8	14.30	7.1
Alcohol: other mental/behavioural disorders	172	34.4	5.54	2.7
Alcohol: dependence	156	31.2	5.02	2.5
Schizophrenia	388	77.6	12.50	6.2
Other schizotypal and delusional disorders	298	59.6	9.60	4.7
Reaction to stress/adjustment disorder	218	43.6	7.02	3.5
Depression/other mood disorders	387	77.4	12.46	6.2
Bipolar affective disorder	123	24.6	3.96	2.0
Other mental and behavioural disorders	428	85.6	13.79	6.8
Gastrointestinal system				
Gastritis/upper gastrointestinal bleeding	134	26.8	4.32	2.1
Other gastrointestinal conditions	107	21.4	3.45	1.7
Injury and poisoning				
Head injury	715	143.0	23.03	11.4
Neck injury	63	12.6	2.03	1.0
Shoulder/upper arm injuries	96	19.2	3.09	1.5
Elbow/forearm injuries	304	60.8	9.79	4.8
Wrist/hand injuries	317	63.4	10.21	5.0
Lower limb injuries	305	61.0	9.82	4.9
Poisoning*	750	150.0	24.16	11.9
Toxic effect of alcohol	96	19.2	3.09	1.5
Other injuries	336	67.2	10.82	5.3
All other diagnoses				
Other conditions	451	90.2	14.53	7.2

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population; Note: admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; emergency department cases removed; *poisoning includes drugs, medicines, and biological substances

New Zealand Distribution by External Cause of Injury

In New Zealand during 2009–2013, 47.4% of alcohol-related hospital admissions in young people had an external cause of injury (e-code) recorded. Of all alcohol-related admissions, 11.7% were associated with an episode of self-harm, and 7.5% with an assault.

Alcohol-related injury associated with a fall was 7.5%, and 7.1% with inanimate mechanical forces. Injuries sustained while the young person was the occupant of a car accounted for 4.9%, with the majority occurring as the result of a car colliding with a stationary object, or overturning (**Table 61**).

Table 61. Listed external causes of injury for alcohol-related hospital admissions in young people aged 15–24 years, New Zealand 2009–2013

Primary external cause of injury	Number: total 2009–2013	Number: annual average	Rate per 100,000	Percent of admissions
Young people aged 15–24 years				
Alcohol-related hospital admissions				
Intentional self-harm	735	147.0	23.67	11.7
Assault	472	94.4	15.20	7.5
Falls	470	94.0	15.14	7.5
Mechanical forces: inanimate	445	89.0	14.33	7.1
Undetermined intent	151	30.2	4.86	2.4
Transport: car occupant collide stationery object	137	27.4	4.41	2.2
Transport: car occupant overturning/non-collision	116	23.2	3.74	1.8
Transport: car occupant, other injury	57	11.4	1.84	0.9
Transport: pedestrian	68	13.6	2.19	1.1
Transport: motorbike	43	8.6	1.38	0.7
Transport: cyclist	26	5.2	0.84	0.4
Transport: all other	35	7.0	1.13	0.6
Thermal injury	29	5.8	0.93	0.5
Poisoning: alcohol	45	9.0	1.45	0.7
Poisoning: other substances	55	11.0	1.77	0.9
Other external causes	96	19.2	3.09	1.5
No external cause of injury listed*	3,308	661.6	106.55	52.6
Total alcohol-related admissions	6,288	1,257.6	202.53	100.0

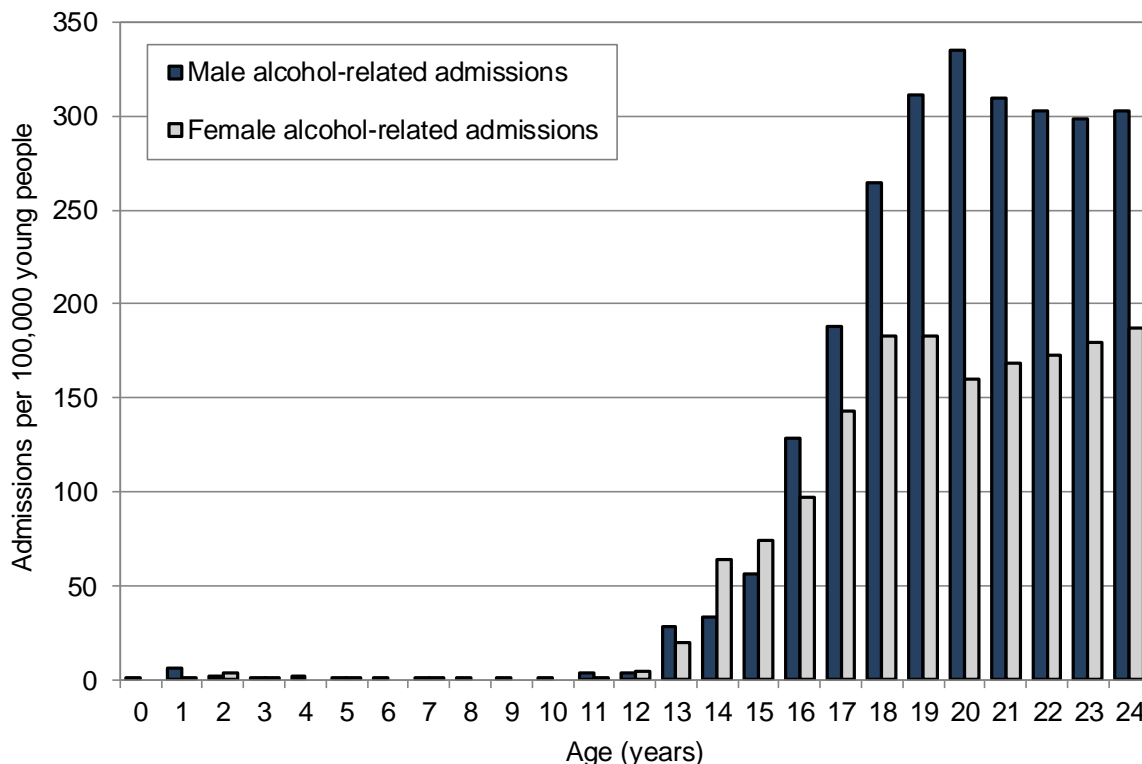
Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population; Note: admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; emergency department cases removed; *includes non-injury admissions

New Zealand Distribution by Age and Gender

In New Zealand during 2009–2013, alcohol-related hospital admissions were relatively infrequent in children, but rose rapidly during the teenage years. While gender differences were less marked for those in their early teens (13–15 years), a marked male predominance was evident from 16 years of age onwards (**Figure 163**).



Figure 163. Alcohol-related hospital admissions in children and young people by age and gender, New Zealand 2009–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population; Note: admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; emergency department cases removed

New Zealand Distribution by Ethnicity, Gender, and NZDep decile

In New Zealand during 2009–2013, alcohol-related hospital admissions were *significantly higher* for males, and for those from less deprived to most deprived areas (NZDep decile 3–10). Rates were also *significantly higher* for Māori young people than for Pacific or European/Other young people (**Table 62**). Similar ethnic differences were seen during 2000–2013 (**Figure 164**).

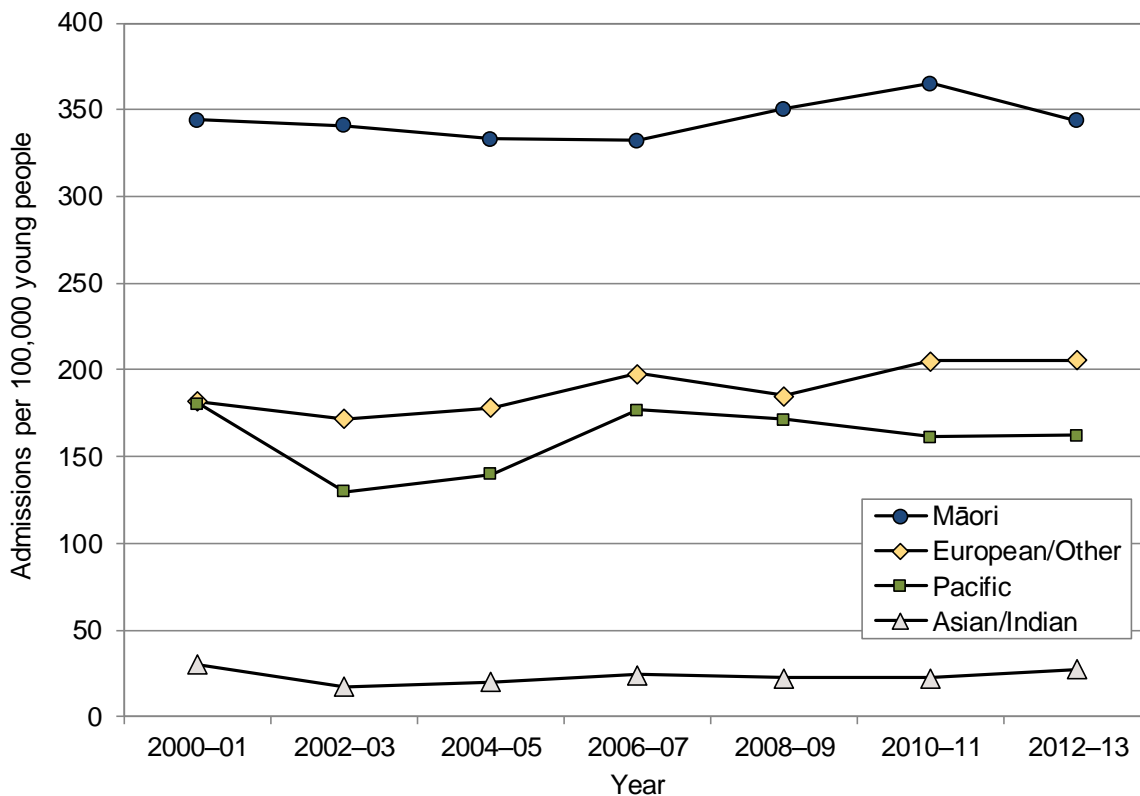


Table 62. Alcohol-related hospital admissions in young people aged 15–24 years by ethnicity, gender, and NZ Deprivation Index decile, New Zealand 2009–2013

Alcohol-related hospital admissions							
Young people aged 15–24 years							
Variable	Rate	Rate ratio	95% CI	Variable	Rate	Rate ratio	95% CI
NZ Deprivation Index decile				NZ Deprivation Index quintile			
Decile 1	122.1	1.00		Deciles 1–2	114.2	1.00	
Decile 2	107.6	0.88	0.75–1.03	Deciles 3–4	147.7	1.29	1.16–1.44
Decile 3	147.4	1.21	1.04–1.41	Deciles 5–6	183.0	1.60	1.45–1.77
Decile 4	148.0	1.21	1.04–1.41	Deciles 7–8	238.5	2.09	1.90–1.41
Decile 5	175.9	1.44	1.25–1.66	Deciles 9–10	270.4	2.37	2.16–2.59
Decile 6	190.3	1.56	1.35–1.80	Prioritised ethnicity			
Decile 7	238.5	1.95	1.70–2.24	Māori	353.3	1.77	1.68–1.87
Decile 8	238.4	1.95	1.71–2.23	Pacific	162.8	0.82	0.74–0.90
Decile 9	263.9	2.16	1.90–2.46	Asian/Indian	25.4	0.13	0.11–0.15
Decile 10	277.0	2.27	1.99–2.58	European/Other	199.5	1.00	
Gender							
Female	154.8	1.00					
Male	248.8	1.61	1.53–1.69				

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population; Note: admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; emergency department cases removed; rates are per 100,000; Rate ratios are unadjusted; ethnicity is level 1 prioritised

Figure 164. Alcohol-related hospital admissions in young people aged 15–24 years by ethnicity, New Zealand 2000–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population; Note: admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; emergency department cases removed; ethnicity is level 1 prioritised



Northern DHBs Distribution and Trends

Northern DHBs vs. New Zealand

In Northland during 2009–2013, alcohol-related hospital admissions in young people were *significantly higher* in than the New Zealand rate, while in the Waitemata, Auckland and Counties Manukau DHBs rates were *significantly lower* (**Table 63**). While the number of alcohol-related admissions per year ranged from 61.2 in Northland to 116.2 in the Waitemata DHB, in reality it is likely that the number was much higher due to the limitations of the National Minimum Dataset in identifying alcohol-related admissions in this age group.

Table 63. Alcohol-related hospital admissions in young people aged 15–24 years, Northern DHBs vs. New Zealand 2009–2013

DHB	Number: total 2009– 2013	Number: annual average	Rate per 100,000	Rate ratio	95% CI
Young people aged 15–24 years					
Alcohol-related hospital admissions					
Northland	306	61.2	319.8	1.58	1.41–1.77
Waitemata	581	116.2	152.9	0.76	0.69–0.82
Auckland	420	84.0	113.9	0.56	0.51–0.62
Counties Manukau	483	96.6	129.4	0.64	0.58–0.70
New Zealand	6,288	1,257.6	202.5	1.00	

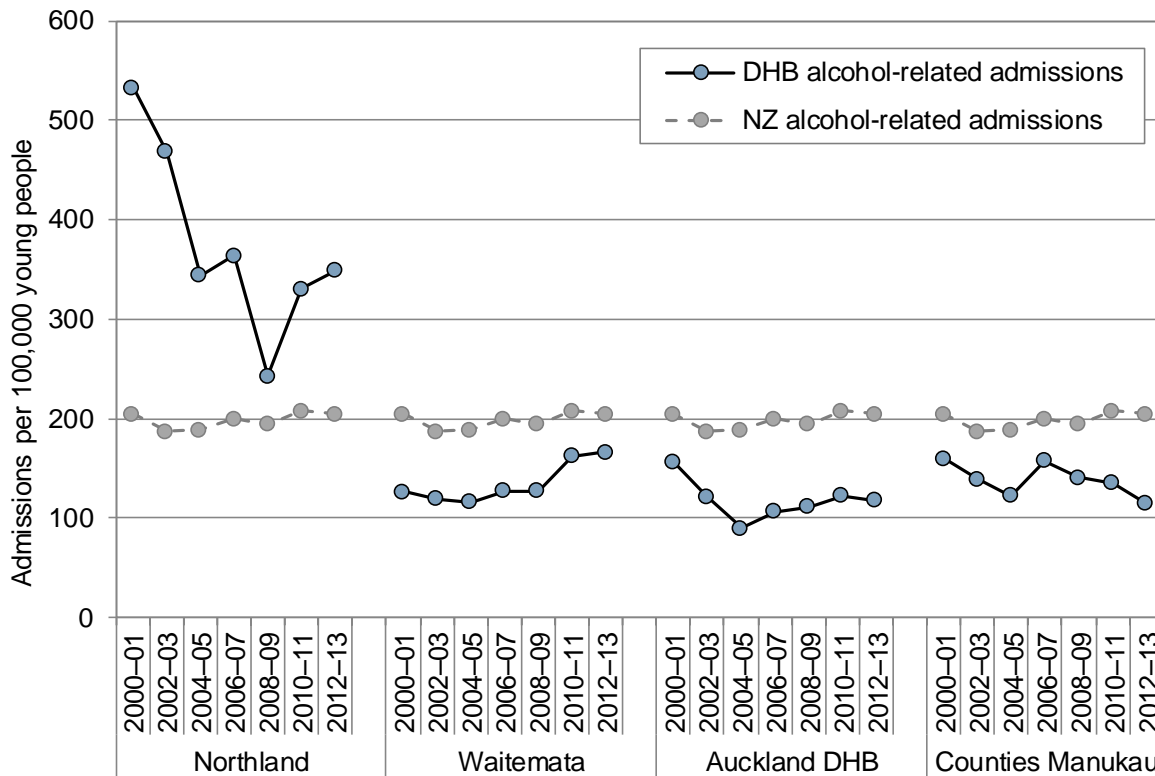
Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population;
Note: admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes;
emergency department cases removed

Northern DHB Trends

In Northland during 2000–2013, alcohol-related hospital admissions in young people were consistently higher than the New Zealand rate, while in the Waitemata, Auckland and Counties Manukau DHBs rates were consistently lower (**Figure 165**).



Figure 165. Alcohol-related hospital admissions in young people aged 15–24 years, Northern DHBs vs. New Zealand 2000–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population; Note: admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; emergency department cases removed

Local Policy Documents and Evidence-based Reviews Relevant to the Prevention of Alcohol-related Harm

Table 64 (below) provides an overview of New Zealand alcohol and addiction policy documents and international evidence based reviews and guidelines that address reducing alcohol use and alcohol-related harm in young people.



Table 64. Local policy documents and evidence-based reviews relevant to the reduction of alcohol-related harm in young people

Ministry of Health publications
<p>Ministry of Health. 2014. Transition Planning Guidelines for Infant, Child and Adolescent Mental Health/Alcohol and Other Drugs Services 2014. Wellington: Ministry of Health. http://www.health.govt.nz/publication/transition-planning-guidelines-infant-child-and-adolescent-mental-health-alcohol-and-other-drugs</p> <p>This guideline for DHBs is intended to promote consistent practice across infant, child and adolescent mental health (ICAMH), and youth-focused alcohol and other drug (AOD) services, and to assist DHBs to develop and implement planning processes for young people transitioning out of and between these services. The website has downloadable planning template examples for a transition plan, a transition planning checklist, and a checklist for service managers and clinical leads.</p>
<p>Ministry of Health. 2012. Rising to the Challenge: The Mental Health and Addiction Service Development Plan 2012–2017. Wellington: Ministry of Health. http://www.health.govt.nz/publication/rising-challenge-mental-health-and-addiction-service-development-plan-2012-2017</p> <p>This plan provides direction for planners, funders and providers of mental health and addiction services on Government priority areas for service development. It focuses on four key areas:</p> <ul style="list-style-type: none"> • making better use of resources • improving integration between primary and secondary services • cementing and building on gains for people with high needs • delivering increased access for all age groups (with a focus on infants, children and youth, older people and adults with common mental health and addiction disorders such as anxiety and depression). <p>Section 5 deals with services for infants, children and young people. It states that the Ministry of Health will work with key stakeholders to develop an agreed set of outcome measures and key performance indicators which will be used to measure progress in implementing the Plan. In the meantime, DHBs are expected to monitor access to specialist services and monitor waiting times for mental health and alcohol and drug (AOD) service separately. Specialist child and youth mental health services and AOD services (DHB and NGO) are expected to enhance delivery and integration of services within primary care, schools and other health services, enhance the flexibility and responsiveness of services, support a coordinated response to meeting the needs of children in care, and support a co-ordinated multi-agency response for youth with complex multi-agency needs.</p>
International guidelines
<p>Jonas D E, Garbutt J C, Brown J M, et al. 2012. Screening, Behavioral Counseling, and Referral in Primary Care to Reduce Alcohol Misuse. Comparative Effectiveness Review No. 64. AHRQ Publication No. 12-EHC055-EF. Rockville, MD: Agency for Healthcare Research and Quality. http://effectivehealthcare.ahrq.gov/ehc/products/269/1134/CER64_AlcoholMisuse_FinalReport_20120608.pdf</p> <p>This review aimed to assess the effectiveness of screening followed by behavioural counselling or adolescents and adults with alcohol misuse in primary care settings. It included 23 RCTs and six systematic reviews. None of the included studies randomised subjects, practices or providers to receive either screening or a comparator and none reported follow up with referrals as an outcome. Trials generally enrolled those with risky or hazardous drinking but excluded those with alcohol dependence. No studies addressed the question of whether or not screening followed by a behavioural counselling intervention, with or without referral, results in reduced morbidity or mortality or changes in other long term (>6 months) outcomes (e.g. health care utilisation, sick days). There was adequate evidence that several screening instruments detect alcohol misuse in adults with acceptable sensitivity and specificity but no studies addressed harms of screening. Overall, the evidence found supported the effectiveness of behavioural interventions for improving several intermediate outcomes (moderate to low strength of evidence, depending on the population and outcome). For young adults and college students there was moderate strength evidence that interventions were effective in reducing consumption (5 out of 5 studies at 6 months follow up) and heavy drinking episodes (one meta-analysis of 3 studies of in-person interventions and one meta-analysis of 2 studies of web-based interventions, both at 6 months follow up), low-strength evidence from one trial (Project TrEAT, 226 young adults) that behavioural interventions were effective in decreasing motor vehicle events (9 vs. 20 motor vehicle crashes with injury, $p < 0.05$ and 114 vs. 149 total motor vehicle events, $p < 0.05$, in the intervention compared to the control group, both after 48 months of follow up), emergency department visits (103 vs. 177, $p < 0.01$) and arrests for controlled substance/liquor violations (0 vs. 8, $p < 0.01$) and moderate strength evidence that they resulted in fewer consequences relating to academic role expectations (two NZ trials, 576 and 104 participants, rate ratio between 0.70 and 0.80). In contrast to the findings of adult studies, some of the benefits of interventions in college students that were significant at six month follow up were no longer significant at 12 month follow up. The review authors stated that this could be due to the natural history of drinking in college students or could indicate a need for additional booster sessions in this population. Five RCTs comparing different types/intensities of interventions did not provide sufficient evidence to draw firm conclusions about whether some types or intensities of intervention are more effective than others. There was no evidence of harms from interventions, aside from the opportunity cost of the time spent participating in the interventions. The review authors concluded that behavioural counselling interventions improve behavioural outcomes for adults with risky/hazardous drinking and brief multi-component interventions have the best evidence of effectiveness.</p>

National Institute for Health and Care Excellence. 2010. **Alcohol-use disorders: preventing harmful drinking**. London: National Institute for Health and Care Excellence. <https://www.nice.org.uk/guidance/ph24/resources/guidance-alcoholuse-disorders-preventing-harmful-drinking-pdf>

This guidance was written for government, industry and commerce, the NHS and all those whose actions affect the population's attitude to, and use of, alcohol. It states that alcohol is a major public health problem and, on the basis of the best available evidence, it identifies the policy options that are most likely to be successful in reducing alcohol-related harm. It states that the evidence indicates that policy change is likely to be more effective and more cost-effective than actions undertaken by local health professionals however it provides recommendations for practice covering the use of screening and brief interventions. The policy recommendations cover price (excise tax and minimum pricing), availability (making it less easy to buy alcohol), and marketing (protecting children from exposure to alcohol advertising). The practice recommendations cover licensing, resources for screening and brief interventions, children and young people aged 10–15 at risk from their alcohol use, screening and brief interventions for young people and adults, extended brief interventions for adults, and referral. Appendix C contains the evidence statements derived from two effectiveness and two cost-effectiveness reviews. These evidence reviews, together with a 2014 evidence update, can be found here: <https://www.nice.org.uk/Guidance/PH24/Evidence> .

Evidence-based medicine reviews

Scott-Sheldon LA, Carey KB, Elliott JC, et al. 2014. **Efficacy of alcohol interventions for first-year college students: a meta-analytic review of randomized controlled trials**. *J Consult Clin Psychol*, 82(2), 177–88

The patterns of high-risk alcohol use established during the first year college (university) can have adverse consequences including poor academic performance, unprotected sex, alcohol abuse and injury or death. This review included studies published up to April 2013 that met the all following criteria:

- (a) they examined an individual- or group-level intervention to reduce alcohol use,
- (b) they sampled first-year college students,
- (c) they were RCTs with a comparison group,
- (d) they measured alcohol use, and
- (e) they provided sufficient statistical information to permit calculation of effect sizes (ES).

The review authors identified 41 such studies, with 62 separate interventions, involving 24,294 students in total. They calculated weighted mean effect sizes (d_+) using fixed- and random-effects models. Compared to controls of any kind, students receiving an intervention reported a lower quantity and frequency of drinking and fewer problems, but effect sizes were small (d_+ values in the range 0.07 to 0.14). Effect sizes were greater when the interventions were compared to assessment only (d_+ values in the range 0.11 to 0.19). In bivariate regression analyses intervention content had a moderating effect on intervention efficacy indicating that providing personalised feedback on consumption, problems or risks; strategies to moderate drinking behaviour, challenges to alcohol expectancies and encouraging students to set alcohol-related goals all help first-year students reduce their quantity and frequency of their alcohol intake. The authors recommend that all new college students should receive screening for risky alcohol use within their first few weeks on campus and that those who report drinking should receive a brief proactive intervention which includes the components identified in their meta-analysis as being helpful.

Foxcroft DR, Tsertsvadze A. 2012. **Universal alcohol misuse prevention programmes for children and adolescents: Cochrane systematic reviews**. *Perspect Public Health*, 132(3), 128–34

This review brings together the findings from three Cochrane reviews (undertaken by the authors), which addressed the effectiveness of “universal” interventions for children and adolescents (aged ≤ 18 years). The reviews covered school-based, family-based and multi-component universal alcohol misuse prevention programmes. The interventions typically did not focus on the prevention of alcohol misuse alone, but rather had a psychosocial orientation designed to have an impact on a range of health and lifestyle behaviours. The reviews included 85 RCTs in total, 53 relating to school based interventions (142,738 participants), 12 relating to family-based interventions ($n=14,595$) and 20 relating to multi-component programmes ($n=57,545$). Most trials were conducted in North America and most were at risk of bias due to some or all of the following: inappropriate unit of analysis, moderate to high attrition, selective outcome reporting, and potential confounding. Meta-analysis was not possible due to heterogeneity between studies. Some of the generic psycho-social and life skills programmes and most of the family-based and multi-component programmes were shown to be effective. There was insufficient evidence to determine whether multiple interventions were superior to single interventions. The most commonly seen positive effects across the interventions were reductions in drunkenness and binge drinking. The review authors concluded that universal prevention programmes can be effective but, due to the variability of results between studies, particular attention should be paid to programme content and delivery context. They stated that, ideally, future implementations of such programmes in different settings should include evaluation studies and that future studies should provide more detailed reporting of programme content and context so that comparisons between studies could identify the features associated with successful interventions.

Thomas RE, et al. 2011. **Mentoring adolescents to prevent drug and alcohol use.** Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD007381.pub2

<http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD007381/frame.html>

This review assessed the effectiveness of structured mentoring programmes to prevent alcohol and drug use. The review included four RCTs with 1,994 participants (aged 12 years in two trials and 9–16 years in two trials), conducted among deprived populations in the US. Two RCTs found that mentoring reduced the rate of initiation of alcohol (pooled RR for mentoring compared to no intervention 0.71, 95% CI 0.57–0.90). A third trial found no significant difference and the fourth trial did not assess alcohol use. One RCT found significantly less “illegal” drug usage (RR 0.54, 95%CI 0.35–0.83). No adverse effects were detected. There was limited scope for the interventions to be effective due to low rates of commencing alcohol and drug use during the intervention period, probably reflecting the relative youth of the study participants.

Other relevant publications

Holm AL, Veerman L, Cobiac L, et al. 2014. **Cost-effectiveness of preventive interventions to reduce alcohol consumption in Denmark.** PLOS One, 9(2), e88041.

<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0088041>

This paper reports on an analysis of the cost-effectiveness of six interventions aimed at reducing alcohol abuse in the adult population of Denmark: a 30% increase in taxation, raising the minimum drinking age, advertising bans, limiting hours of retail sales and brief and longer interventions for individuals with alcohol problems. In Denmark the minimum legal age for purchasing alcohol in retail outlets is 16 years and the minimum age for drinking in bars and restaurants is 18. The evaluation of health effects considered changes in incidence, prevalence and mortality of alcohol related diseases and alcohol-related injury. Net costs were based on health care costs from Danish national registers and calculated as the sum of intervention costs and cost offsets related to reductions in treatment of alcohol-related outcomes. The researchers evaluated cost-effectiveness by calculating incremental cost-effectiveness ratios (ICERs) for each intervention. They found that three of the interventions (taxation, advertising ban and limiting retail sales) were cost saving and the other three interventions were all cost-effective. Net costs ranged from €8 million per year (NZ\$12.6 million) for longer individual interventions to €–17million (NZ\$26.7 million) for advertising bans. Effectiveness ranged from 115 disability-adjusted life years (DALYs) per year for increasing the purchase age to 18 years to 2,900 DALYs for banning advertising. The total annual effect of implementing all the interventions was estimated to be 7,300 DALYs at a net cost of €–30million. The researchers concluded that population-wide interventions were more effective than interventions focused on individuals and that highest priority should be given to the interventions with the highest probability of being cost saving: banning alcohol advertising, limiting hours of retail sales and increasing taxation.

Alcohol and Public Policy Group. 2010. **Alcohol: no ordinary commodity—a summary of the second edition.**

Addiction, 105(5), 769–79. <http://onlinelibrary.wiley.com/doi/10.1111/j.1360-0443.2010.02945.x/abstract>

This article is a summary of the book *Alcohol: No Ordinary Commodity* (2nd edn). The first part of the book explains why alcohol is not an ordinary commodity and reviews epidemiological data that establishes alcohol as a major contributor to the global burden of disease, disability and death in countries of all incomes. It also describes how global corporations have consolidated international beer and spirits production and expanded their operations in Eastern Europe, Latin America, Asia and Africa. The second part of the book reviews the scientific evidence for strategies and interventions to prevent or minimise alcohol-related harm in seven key areas: pricing and taxation, regulating the physical availability of alcohol, modifying the drinking context, drink-driving countermeasures, restrictions on marketing, education and persuasion strategies, and treatment and early intervention services. The final part of the book addresses local, national and international policy-making and rates the public health effectiveness of strategies and interventions. It states that, overall, the strongest and most cost-effective strategies include taxation to increase prices, restrictions on the physical availability of alcohol, measures to address drink-driving, brief interventions with at-risk drinkers, and treatment of people with alcohol dependence.

Other relevant New Zealand publications

Ministry of Justice. 2014. **The Effectiveness of Alcohol Pricing Policies: Reducing harmful alcohol consumption and alcohol-related harm.** Wellington: Ministry of Justice. <http://www.justice.govt.nz/publications/global-publications/e/the-effectiveness-of-alcohol-pricing-policies>

This is the report of a study conducted as part of the Government's consideration of measures to reform New Zealand's alcohol laws. It investigates the potential impact of a minimum price regime on reducing harmful alcohol consumption. It notes that previous studies have suggested that imposing a minimum price per standard drink could reduce harmful alcohol consumption particularly among young people who are the greatest consumers of low cost, high alcohol volume products. The study focused on two minimum pricing options for a standard drink: \$1.00 and \$1.20. It concluded that both pricing options provided net benefits to society but that an excise tax increase to bring the minimum alcohol price up to the same levels would have much greater benefits since it would raise the price of all alcohol (not just the lowest-priced alcohol) and would therefore have a greater impact on consumer behaviour. On the basis of this report, the Ministry of Justice recommended that a minimum price not be considered for introduction for five years since this would allow time for the impact of the alcohol reforms to be assessed and for learning from the experiences of other countries such as Scotland and the UK should they introduce minimum pricing.

Kypri K, Vater T, Bowe SJ, et al. 2014. **Web-based alcohol screening and brief intervention for university students: a randomized trial.** JAMA, 311(12), 1218–24.

This study aimed to evaluate a national web-based alcohol screening and brief intervention programme. Emails containing hyperlinks to the Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) screening test were set to 14,991 New Zealand university students aged 17–24 years. Participants who screened positive were randomised to either undergo screening alone or receive ten minutes of assessment and feedback on alcohol expenditure, peak blood alcohol concentration, and alcohol dependence, as well as access to help and information. After five months, a fully automated outcome assessment measured six primary outcomes: drinking frequency, consumption per typical occasion, volume of alcohol consumed, and academic problem score, and whether participants exceeded medical guidelines for acute harm (binge drinking) and chronic harm (heavy drinking). There were 5,135 students screened of whom 4,322 screened positive and were randomised, and 83% were followed up. Compared to control participants, intervention participants consumed less alcohol per occasion (median 4 vs. 5 drinks, rate ratio 0.93; 99.17% CI 0.86–1.00; $p=0.005$). There were no differences for drinking frequency, total volume of alcohol consumed, or academic problem scores. Differences in risks of binge drinking and heavy drinking were not statistically significant. In a sensitivity analysis that accounted for attrition, the effect on alcohol consumption per typical occasion was no longer statistically significant. The researchers concluded that the intervention did not produce significant reductions in frequency or overall volume of drinking or academic problems but there remained a small possibility that it may have led to a small reduction in the amount of alcohol consumed in a typical drinking occasion.

Connor J, Cousins K, Samaranyaka A, et al. 2014. **Situational and contextual factors that increase the risk of harm when students drink: Case-control and case-crossover investigation.** Drug Alcohol Rev, 33(4), 401–11.

This paper reports on the results of a web-based survey of full-time students ages 17–25 years at five New Zealand universities, the 2013 Tertiary Student Health Survey. Survey questions aimed to identify situational and contextual factors associated with unintentional injury, assault, unsafe sex, sexual assault and drink-driving/riding. There were 2,683 participants who provided data for this study (a 49% response rate). For the seven days preceding the survey, 7.4% of men and 4.9% of women reported at least one of the defined events while they were drinking or soon afterwards. The researchers compared the situational and contextual characteristics of these events with the circumstances of the last drinking occasion for participants who did not experience an adverse event (a case-control analysis) and they compared the circumstances of each adverse event with the circumstances of the adverse event sufferer's own last drinking occasion (a case-crossover analysis). In both the case-control and case-crossover models, the number of drinking locations and getting more drunk than expected were strongly associated with risk of an event, independent of consumption (total number of drinks). In the case control analysis, total number of drinks, drinking with close friends, and drinking later and into the morning, were also associated with increased risk. After controlling for drinking and contextual factors there were no gender differences. The researchers concluded that, to reduce the risk of alcohol-associated adverse events, strategies to reduce the duration and volume of alcohol consumption should be considered, for example earlier closing of licenced premises.

Connor J, Psutka R, Cousins K, et al. 2013. **Risky drinking, risky sex: a national study of New Zealand university students.** Alcoholism: Clinical & Experimental Research, 37(11), 1971–8.

This study aimed to estimate the association of risky sexual behaviour with usual drinking pattern, drinking at the time of the sexual event, and beliefs that alcohol will positively affect sexual experiences. It used data from a cross-sectional web-based survey of randomly-selected New Zealand university students, the 2009 Tertiary Student Health Survey. The survey collected event-level data (drinking, partner type, and condom use at last sexual intercourse) as well as contextual data (usual alcohol consumption [AUDIT-C score], history of binge drinking, alcohol-related sexual enhancement expectancies). The researchers used regression models to estimate associations and potential mediating factors. There were 2,921 survey respondents (a 50.6% response rate). All the analyses were weighted to take account of the oversampling of Māori students. After weighting, of those respondents who had ever had sex, 32% indicated they had been drinking and 56% that they had used a condom at last sex; 10.7% reported that their last sexual intercourse was with a non-regular partner and without a condom ("risky sex") (12.3% of men; 9.8% of women; $p=0.159$). For both men and women, alcohol-sex expectancy scores and current drinking (AUDIT-C) scores were independently associated with quantity of alcohol at last sex. For both men and women, the association of current drinking or expectancy with risky sex was mediated by alcohol at last sex. The researchers concluded that heavy drinking appears to be an important and potentially modifiable factor among the complex factors contributing to risky sexual behaviour and negative sexual health outcomes. They stated that addressing the environmental determinants of hazardous drinking could reduce negative sexual outcomes in university students and other young people, that continuing promotion of condom use is needed and that further integration of health promotion efforts relating to alcohol and sexual health is warranted.

Fergusson D, Boden J. 2011. **Alcohol use in adolescence**. In Prime Minister's Science Advisory Committee (Ed.), Improving the Transition Reducing Social and Psychological Morbidity During Adolescence: A report from the Prime Minister's Chief Science Advisor. Auckland: Office of the Prime Minister's Science Advisory Committee.
<http://www.pmcsa.org.nz/wp-content/uploads/Improving-the-Transition-report.pdf>

This chapter examines the use and misuse of alcohol by young people in New Zealand, describes the harms associated with alcohol misuse, and outlines policy options for regulating alcohol use and reducing alcohol-related harms. It states that there is increasing international evidence for effective policies to reduce alcohol-related problems in young people. These policies include raising alcohol taxation; regulating the availability of alcohol; regulation of drink driving; restrictions on alcohol marketing; and development of effective treatment services. It states that the following interventions are not, or only marginally, effective: warning labels on alcohol containers and public service advertisements encouraging responsible drinking. It endorses the recommendations in the Law Commission report (see below) especially increasing the cost of alcohol, raising the drinking age, having a zero-tolerance policy towards drink driving in under-21s, greater investment in treatment services for young people with significant alcohol-related problems and further restrictions on advertising, hours of sale, number of outlets and supply of alcohol in premises frequented by young people.

The Law Commission. 2010. **Alcohol in our lives: Curbing the harm. A Report on the review of the Regulatory Framework for the sale and Supply of Liquor (NZLC R114)**. Wellington. The Law Commission.

<http://www.lawcom.govt.nz/project/review-regulatory-framework-sale-and-supply-liquor/publication/report/2010/alcohol-our-lives>

This very comprehensive report is the result Law Commission's work examining and evaluating New Zealand's laws and policies relating to the sale, supply and consumption of liquor in New Zealand. The report is structured in four parts: Part 1 reviews the case for reducing alcohol-related harm. Part 2 discusses recommendations for controlling the supply of alcohol. Part 3 addresses proposals for reducing the demand for alcohol and Part 4 examines recommendations for limiting alcohol-related problems. Chapter 16 summarises the evidence regarding alcohol-related harm and young people and outlines the rationale for, and probable impact of, policy changes relating to minimum purchase age, drinking in public places, supply of alcohol to minors, the role of parents, and the age at which people may sell alcohol. It recommends increasing the minimum purchase age to 20 in all licenced premises; prohibiting anyone under 20 from possessing or drinking alcohol in public, including in cars on roads (even if accompanied by a parent or guardian); making it an offence for anyone to supply alcohol to a minor on private property unless that person is the young person's parent or guardian or a responsible adult approved by the parent or guardian; making it an offence for a parent, guardian or approved adult to supply alcohol to a minor in an irresponsible manner; and prohibiting anyone under 20 from being employed to sell alcohol.

Websites

Health Promotion Agency (HPA). <http://www.hpa.org.nz/> accessed July 2014.

The HPA is Crown entity established on 1 July 2012 to lead and support national health promotion initiatives. It also performs functions previously undertaken by the Alcohol Advisory Council (ALAC). Their website had a variety of alcohol-related resources, including the HPA's Early intervention Addiction Plan 2013–17, http://www.alcohol.org.nz/sites/default/files/04634_HPA_Early_intervention_addiction_plan_revisedjuly_online_FA.pdf, which, although dealing with all forms of addition, has a particular focus on alcohol. The plan addresses the way the system, in particular the primary health care system, identifies and responds to problem alcohol use, and the interface between health promotion and intervention.

The HPA also maintains another website: <http://www.alcohol.org.nz/> with additional resources including legislation and local strategies, statistics and research.

AMPHORA Alcohol Public Health Research Alliance. <http://www.amphoraproject.net/> accessed July 2014.

The AMPHORA project was a four-year €4 million project launched in 2008 and co-financed by the Seventh Framework Programme (FP7) of research of the European Commission and coordinated by the Hospital Clínic de Barcelona (HCPB) in Spain. Its three main objectives were to:

- Provide new scientific evidence for the most effective public health measures to reduce the harm done by alcohol
- Promote the translation of science into policy and disseminate new knowledge to policy makers
- Collaborate with partner organisations from 13 European countries and counterparts from all member states.

The project website is not the most user-friendly, but it has a lot relevant material. The AMPHORA e-book **Alcohol Policy in Europe: Evidence from AMPHORA** provides an overview of the findings of the project's studies. It can be found here: http://www.amphoraproject.net/view.php?id_cont=45&PHPSESSID=kcqh5uof4r5107rkvui7vs4oi1.

Drug and Alcohol Findings. <http://findings.org.uk/> accessed July 2014.

This is the website of Drug and Alcohol findings, a UK-based partnership project managed by Alcohol Concern, DrugScope, the National Addiction Centre, Alcohol Research UK, and the editor, Mike Ashton. The project aims to provide practitioners providing drug and alcohol interventions with summaries of UK-relevant research, place the findings from research in context, and explore the implications of the findings for practice. The topic search page, http://findings.org.uk/topic_search.htm groups documents by broad themes and, by checking boxes, users can find publications in their area of interest.

Note: the publications listed were identified using the search methodology outlined in **Appendix 1**

HEALTH OUTCOMES AS DETERMINANTS



HOSPITAL ADMISSIONS AND MORTALITY WITH A SOCIAL GRADIENT

Introduction

In New Zealand, there are currently large disparities in many measures of child health status between children belonging to different socio-economic groups within the population, and between Māori and Pacific children and children of other ethnicities. Ethnic and/or socioeconomic disparities among children have been observed in rates of skin infections [362], asthma [363], rheumatic fever [364], road traffic crashes [365], meningitis [366], unintentional injuries [367] burns [368], overall mortality, and mortality from injury (both road and non-road traffic injury) [369] and sudden infant death syndrome [370].

The higher hospital admission rates for infectious and respiratory diseases for children in socioeconomically disadvantaged families can be readily understood to arise from poor living conditions: poor quality housing, especially housing that is cold and damp, overcrowded living spaces which facilitate the spread of infection, and inability to pay for adequate heating, nutritious food, and the costs associated with accessing medical care. Since infectious and respiratory diseases are among the most common reasons why children are admitted to hospital, if the infectious disease admission rates of the most deprived children became equal to those of the least deprived children there could be substantial savings for the hospital sector. The causes of socio-economic disparities in admission rates for other medical conditions and for injuries may be less obvious but these disparities undoubtedly exist, and have been well documented, both in New Zealand and in other countries [7,371,372].

This section reports on hospital admission rates and mortality rates for medical conditions and injuries for which there is a social gradient, using data from the National Minimum Dataset and the National Mortality Collection, for children aged 0–14 years.

Data Source and Methods

Indicators

1. Hospital admissions for medical conditions and injuries with a social gradient in children aged 0–14 years
2. Mortality from medical conditions and injuries with a social gradient and sudden unexpected death in infancy (SUDI) in children aged 0–14 years

Data source

Numerator:

Hospital admissions for medical conditions with a social gradient: acute and arranged (arranged = within 7 days of referral) hospital admissions (waiting-list cases and neonates <28 days excluded) with the following ICD-10-AM primary diagnoses: A00–A09, R11, K529 (gastroenteritis); A15–A19 (tuberculosis); A33, A34, A35, A36, A37, A80, B05, B06, B16, B26, B18.0, B18.1, P35.0 or M01.4 (vaccine preventable diseases); A39 (meningococcal disease); B34 (viral infection of unspecified site); E40–E64 or D50–D53 (nutritional deficiencies/anaemias); J00–J03 or J06 (acute upper respiratory infections); J04 (croup/laryngitis/tracheitis/epiglottitis); J12, J10.0 or J11.0 (pneumonia: viral); J13–J16 or J18 (pneumonia: bacterial, non-viral, unspecified); J21 (acute bronchiolitis); J22 (acute lower respiratory infection unspecified); J45–J46, R062 (asthma and wheeze); J47 (bronchiectasis); G00–G01 (meningitis: bacterial); A87, G02 or G03 (meningitis: viral, other, NOS); G40 or G41 (epilepsy or status epilepticus); H65, H66 or H67 (otitis media); I00–I09 (rheumatic fever/heart disease); K40 (inguinal hernia); L00–L08, H00.0, H01.0, J34.0 or L98.0 (skin infections); L20–L30 (dermatitis and eczema); M86 (osteomyelitis); N10, N12, N13.6, N30.0, N30.9 or N39.0 (urinary tract infection); R56.0 (febrile convulsions).

Injury admissions with a social gradient: hospital admissions (emergency department cases, neonates <28 days excluded) with a primary diagnosis of injury (ICD-10-AM S00–T79) and an ICD-10-AM primary external cause code in the following range: V01–V09 (transport: pedestrian); V10–V19 (transport: cyclist); V40–V79 (transport: vehicle occupant); W00–W19 (falls); W20–W49 (mechanical forces: inanimate); W50–W64 (mechanical forces: animate); W85–X19 (thermal injury); X40–X49 (poisoning). In order to ensure comparability over time, all injury cases with an Emergency Department specialty code (M05–M08) on discharge were excluded.

Mortality from conditions with a social gradient: all deaths (neonates <28 days excluded) with a main underlying cause of death in the ICD-10-AM medical and injury categories outlined above. In addition, post-neonatal sudden unexpected deaths in infancy (SUDI) were included if the child was aged between 28 days and 1 year and their main underlying cause of death was SUDI (R95, R96, R98, R99, W75, W78, W79).



Denominator: Statistics NZ estimated resident population

Notes on Interpretation

Note 1: Hospital admissions in neonates (<28 days) were excluded from both indicators. These admissions are more likely to reflect issues arising prior to or at the time of birth (e.g. preterm infants may register multiple admissions as they transition from neonatal intensive care (NICU), through special care baby units (SCBU) to the postnatal ward). Further, the aetiology of respiratory infections and/or other medical conditions arising in these contexts may differ from those arising in the community.

Note 2: For medical conditions, only acute and arranged admissions were included, as waiting list admissions were seen as being more influenced by service capacity (e.g. the demographic profile of those admitted acutely with otitis media may have differed from those admitted from the waiting list for grommets (who in the vast majority of cases also have a primary diagnosis of otitis media)). For injury admissions, however, filtering by admission type was not undertaken. All injury cases with an Emergency Department specialty code (M05–M08) on discharge were excluded however (see **Appendix 3** for rationale).

Note 3: Hospital admissions were considered to have a social gradient if rates for those in the most deprived areas (NZDep deciles 9–10) were ≥ 1.8 times higher than for those in the least deprived areas (NZDep deciles 1–2), or where rates for Māori, Pacific or Asian/Indian children were ≥ 1.8 times higher than for European children. In addition, a small number of conditions were included where rates were ≥ 1.5 times higher, they demonstrated a consistent social gradient, and the association was biologically plausible.

Note 4: When considering differences in the magnitude of social gradients between medical and injury admissions note that these rates are not strictly comparable. For technical reasons, Emergency Department (ED) cases have been removed from injury admissions (and social differences in attendance at the ED vs. primary care for minor medical conditions may have accounted for some of the social gradients in medical admission seen). No such differential filtering was applied to mortality data, however, and thus the magnitude of the social differences seen in mortality data is more readily comparable.

Note 5: SUDI rates are traditionally calculated per 1,000 live births. For this analysis the denominator used was children aged 0–14 years, so that the relative contribution SUDI makes to mortality in this age group (as compared to other causes of death) is more readily appreciated. As a result, the SUDI rates in this section are not readily comparable to traditional SUDI mortality rates for those <1 year reported elsewhere.

For further detail on the methodology used see **Appendix 9**.

Note 6: In 2013, a number of changes were made to the ICD-10-AM codes included in this indicator. The changes included the broadening of asthma (J45–J46) to asthma and wheeze (J45–J46, R062) to take into account a shift in the way paediatricians were diagnosing asthma in preschool children, and the addition of J22 (unspecified lower respiratory infections), due to the likely overlap with the already included J18.9 (unspecified pneumonia) category (see **Appendix 10**). Two additional codes were added to the sudden unexpected death in infancy (SUDI) indicator (W78: inhalation of gastric contents; and W79: inhalation and ingestion of food causing obstruction of the respiratory tract) to ensure consistency with the Child and Youth Mortality Review Committee's SUDI reporting. As a result, the rates in this section are not directly comparable with those presented in NZCYES reports prior to 2013.

New Zealand Distribution and Trends

Distribution by Cause

Hospital admissions: In New Zealand during 2009–2013, asthma and wheeze, bronchiolitis, and acute respiratory infections (excluding croup) made the largest individual contributions to hospitalisations for medical conditions with a social gradient, and infectious and respiratory diseases collectively were responsible for the majority of admissions. Similarly, falls followed by inanimate mechanical forces were the leading causes of injury admissions with a social gradient, although transport injuries as a group also made a significant contribution (**Table 65**).

Mortality: In New Zealand during 2007–2011, SUDI made the single largest contribution to mortality with a social gradient in children aged 0–14 years. This occurred despite the fact that, by definition, all of these deaths occurred during the first year of life. Vehicle occupant deaths made the largest contribution to injury-related deaths, followed by drowning/submersion, and pedestrian injuries. Bacterial, non-viral, or unspecified pneumonia was the leading cause of mortality from medical conditions (**Table 66**).



Table 65. Hospital admissions for conditions with a social gradient in children aged 0–14 years (excluding neonates) by primary diagnosis, New Zealand 2009–2013

Primary diagnosis	New Zealand			
	Number: total 2009–2013	Number: annual average	Rate per 1,000	Percent of total
Medical conditions				
Asthma and wheeze	31,390	6,278.0	6.95	15.4
Acute bronchiolitis	29,431	5,886.2	6.52	14.4
Acute respiratory infections*	28,418	5,683.6	6.29	13.9
Gastroenteritis	27,325	5,465.0	6.05	13.4
Viral infection of unspecified site	20,882	4,176.4	4.63	10.2
Skin infections	16,273	3,254.6	3.60	8.0
Pneumonia: bacterial, non-viral	13,267	2,653.4	2.94	6.5
Urinary tract infection	7,319	1,463.8	1.62	3.6
Croup/laryngitis/tracheitis/epiglottitis	6,223	1,244.6	1.38	3.1
Epilepsy or status epilepticus	4,471	894.2	0.99	2.2
Dermatitis and eczema	3,586	717.2	0.79	1.8
Febrile convulsions	3,181	636.2	0.70	1.6
Otitis media	2,966	593.2	0.66	1.5
Pneumonia: viral	2,357	471.4	0.52	1.2
Inguinal hernia	1,206	241.2	0.27	0.6
Osteomyelitis	1,172	234.4	0.26	0.6
Rheumatic fever/heart disease	996	199.2	0.22	0.5
Vaccine preventable diseases	943	188.6	0.21	0.5
Meningitis: viral, other, NOS	813	162.6	0.18	0.4
Bronchiectasis	681	136.2	0.15	0.3
Meningococcal disease	355	71.0	0.08	0.2
Nutritional deficiencies/anaemias	325	65.0	0.07	0.2
Meningitis: bacterial	198	39.6	0.04	0.1
Tuberculosis	48	9.6	0.01	0.0
New Zealand total	203,826	40,765.2	45.15	100.0
Injury admissions				
Falls	22,550	4,510.0	4.99	50.1
Mechanical forces: inanimate	11,664	2,332.8	2.58	25.9
Mechanical forces: animate	2,910	582.0	0.64	6.5
Transport: cyclist	2,140	428.0	0.47	4.8
Thermal injury	1,996	399.2	0.44	4.4
Poisoning	1,908	381.6	0.42	4.2
Transport: vehicle occupant	849	169.8	0.19	1.9
Transport: pedestrian	791	158.2	0.18	1.8
Drowning/submersion	167	33.4	0.04	0.4
New Zealand total	44,975	8,995.0	9.96	100.0

Source: Numerator: National Minimum Dataset (neonates removed); Denominator: Statistics NZ Estimated Resident Population; Note: *Medical conditions*: acute and arranged admissions only; *Injury admissions*: excludes Emergency Department cases



Table 66. Mortality from conditions with a social gradient in children aged 0–14 years (excluding neonates) by main underlying cause of death, New Zealand 2007–2011

Cause of death	Number: total 2007–2011	Number: annual average	Rate per 100,000	Percent of category
Medical conditions				
Pneumonia: bacterial, non-viral	39	7.8	0.87	27.3
Meningococcal disease	24	4.8	0.54	16.8
Epilepsy or status epilepticus	22	4.4	0.49	15.4
Pneumonia: viral	13	2.6	0.29	9.1
Asthma and wheeze	12	2.4	0.27	8.4
Gastroenteritis	11	2.2	0.25	7.7
Meningitis	5	1.0	0.11	3.5
Bronchiectasis	3	0.6	0.07	2.1
Acute bronchiolitis	3	0.6	0.07	2.1
Other conditions	11	2.2	0.25	7.7
Total medical conditions	143	28.6	3.19	100.0
Injuries				
Transport: vehicle occupant	79	15.8	1.76	35.9
Drowning/submersion	50	10.0	1.11	22.7
Transport: pedestrian	36	7.2	0.80	16.4
Mechanical forces: inanimate/animate	15	3.0	0.33	6.8
Thermal injury	14	2.8	0.31	6.4
Transport: cyclist	10	2.0	0.22	4.5
Poisoning	9	1.8	0.20	4.1
Falls	7	1.4	0.16	3.2
Total injuries	220	44.0	4.90	100.0
Post neonatal SUDI				
Post neonatal SUDI	271	54.2	6.04	
Total mortality New Zealand	634	126.8	14.13	

Source: Numerator: National Mortality Collection (neonates removed); Denominator: Statistics NZ Estimated Resident Population; Note: SUDI numerators are for infants aged 28–364 days only

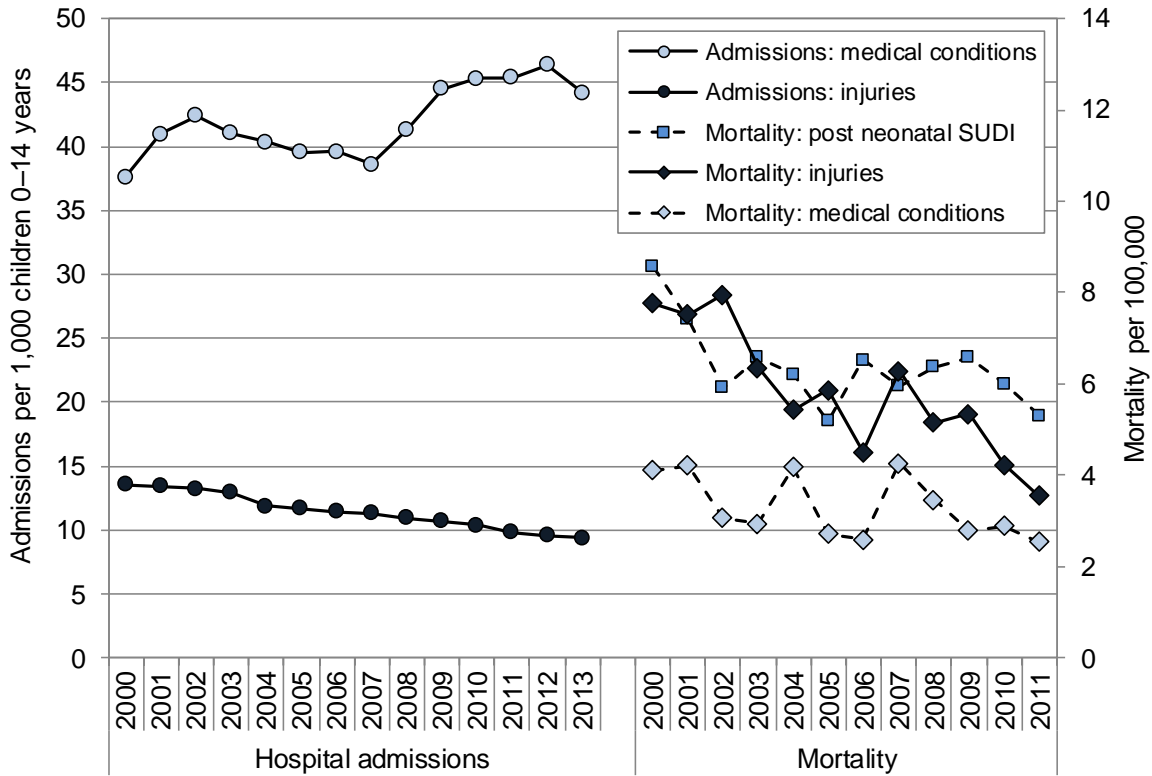
New Zealand Trends

Hospital admissions: In New Zealand, medical admissions with a social gradient increased during the early 2000s, reached a peak in 2002, and then declined until 2007. An upswing in rates was evident from 2007 to 2012. In contrast, injury admissions with a social gradient declined throughout 2000–2013 (**Figure 166**).

Note: Emergency Department (ED) cases are excluded from injury admissions so trends in medical and injury admissions are not comparable. Inconsistencies in DHB reporting of ED cases to the National Minimum Dataset may have affected trends in admissions for medical conditions with a social gradient. Many DHBs were reporting their ED cases from the early 2000s. **Figure 167** shows the increase in admissions in DHBs who changed their reporting practice from 2009, when the Ministry made reporting of ED day cases mandatory. While the increase in numbers is modest, some (but not all) of the increase in medical admissions seen during this period may be due to these changes. See **Appendix 3** for further details.

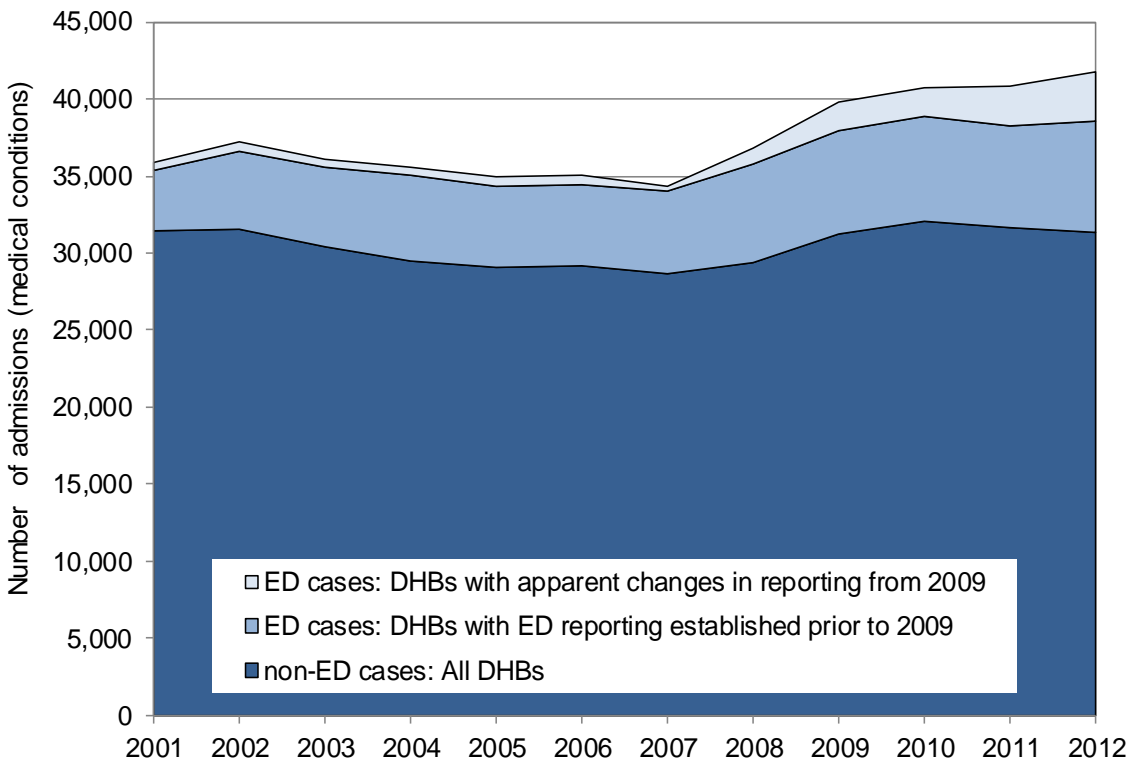
Mortality: In New Zealand, mortality from injuries with a social gradient gradually decreased between 2000 and 2011. Post-neonatal SUDI decreased between 2000 and 2002 and thereafter remained relatively static, while mortality from medical conditions with a social gradient fluctuated throughout 2000–2011 (**Figure 166**).

Figure 166. Hospital admissions (2000–2013) and mortality (2000–2011) from conditions with a social gradient in New Zealand children aged 0–14 years (excluding neonates)



Source: Numerator Admissions: National Minimum Dataset; Numerator Mortality: National Mortality Collection
 Denominator: Statistics NZ Estimated Resident Population; Note: *Medical conditions*: acute and arranged admissions only; *injury*: excludes emergency department cases

Figure 167. Hospital admissions for medical conditions with a social gradient in children aged 0–14 years by health specialty on discharge and DHB reporting practice, New Zealand 2001–2012



Source: National Minimum Dataset. Acute and arranged admissions only; Note: ED cases are those with a health specialty code on discharge of M05–M08



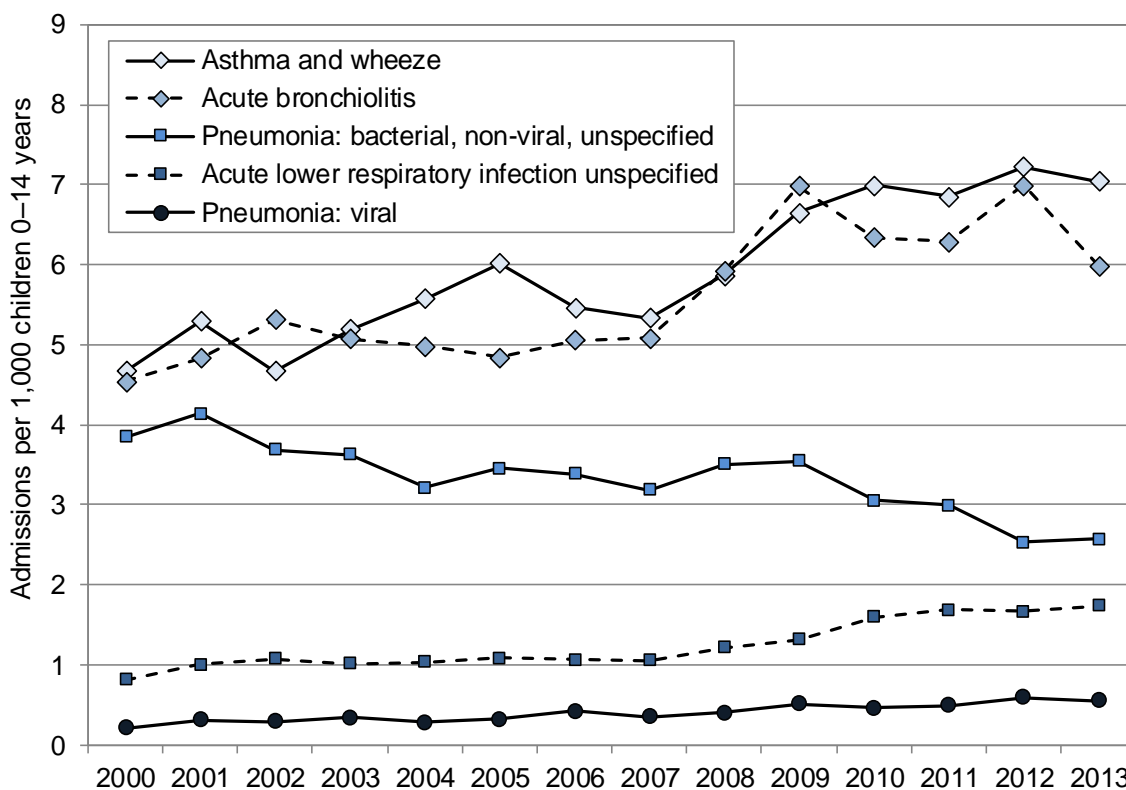
Trends in Hospital Admissions by Primary Diagnosis

Lower respiratory conditions: Since 2000, hospital admissions for bronchiolitis and asthma and wheeze increased in children aged 0–14 years, as did admissions for viral pneumonia. Admissions for bacterial, non-viral, or unspecified pneumonia declined. Admissions for unspecified acute lower respiratory infections were relatively stable during 2000–2006, and increased thereafter (**Figure 168**).

Upper respiratory tract and unspecified viral infections: While trends in admissions for acute upper respiratory infections and viral infections of unspecified site were variable during the early-to-mid 2000s, since 2007 both have exhibited a general upward trend. Admissions for croup/laryngitis/tracheitis/epiglottitis were static, while admissions for otitis media declined after 2007 (**Figure 169**).

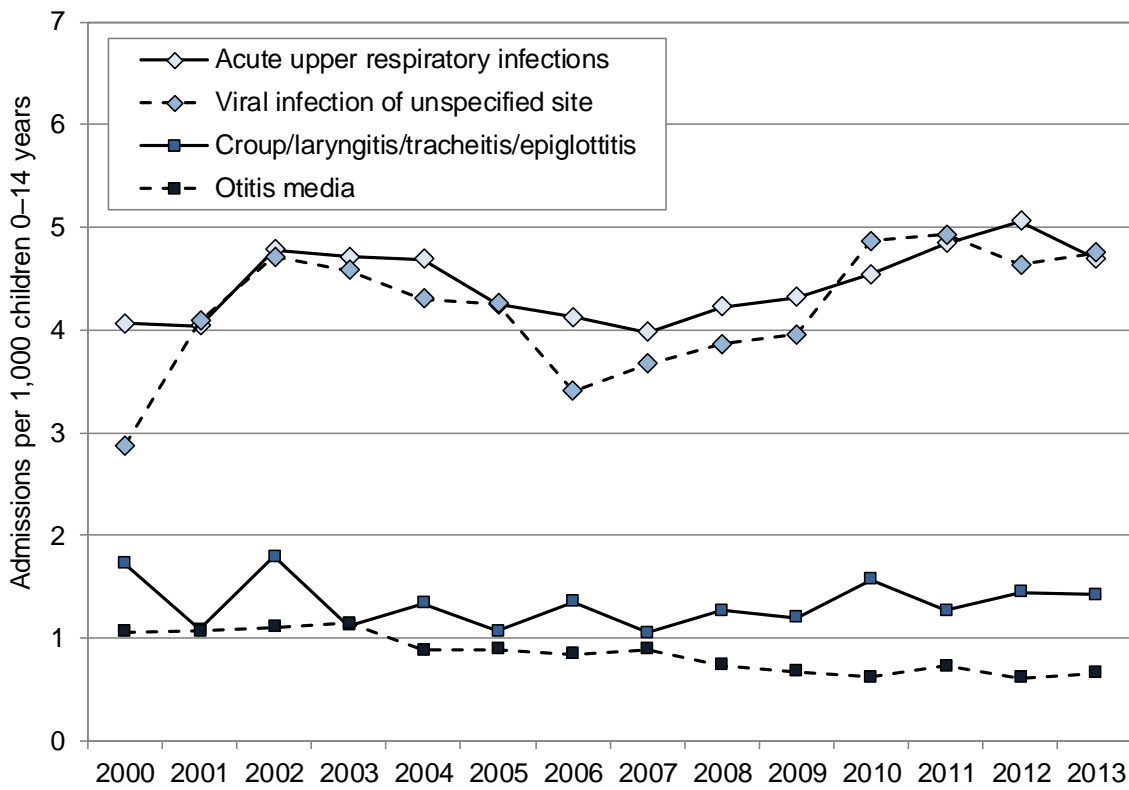
Other medical conditions: During 2000–2013, hospital admissions for gastroenteritis, skin infections, dermatitis and eczema, and urinary tract infections in children aged 0–14 years all exhibited a general upward trend, while admissions for inguinal hernias declined. Trends for a number of other conditions were more variable (**Figure 170, Figure 171**).

Figure 168. Hospital admissions for lower respiratory conditions with a social gradient in children aged 0–14 years (excluding neonates), New Zealand 2000–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population;
Note: Acute and arranged admissions only

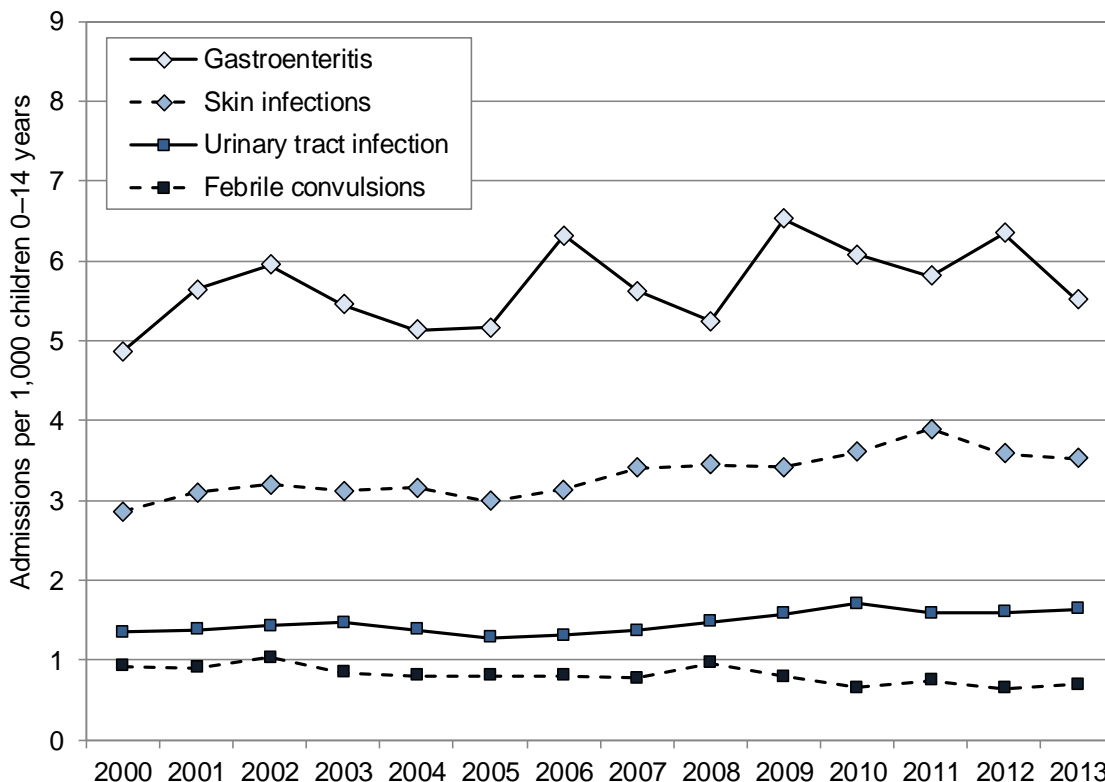
Figure 169. Hospital admissions for acute upper respiratory tract infections and unspecified viral infections in children aged 0–14 years (excluding neonates), New Zealand 2000–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population;
 Note: Acute and arranged admissions only

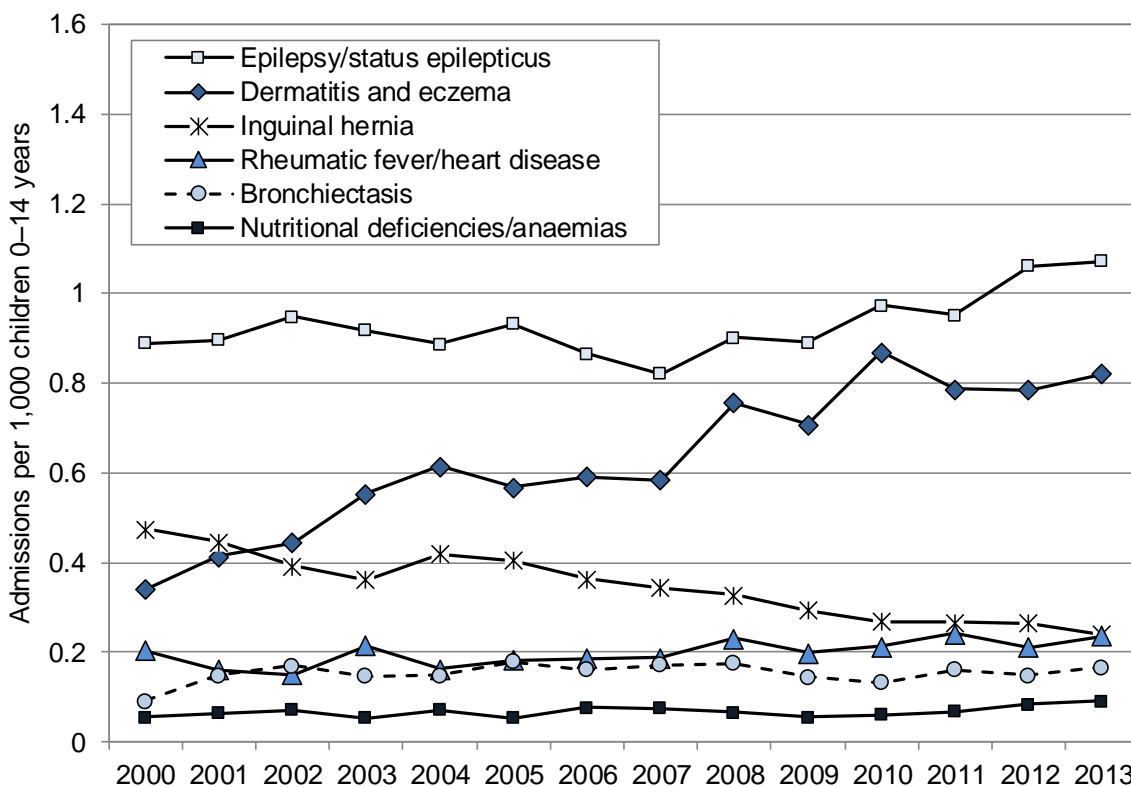


Figure 170. Hospital admissions for selected acute medical conditions with a social gradient in children aged 0–14 years (excluding neonates), New Zealand 2000–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population; Note: Acute and arranged admissions only

Figure 171. Hospital admissions for selected chronic medical conditions with a social gradient in children aged 0–14 years (excluding neonates), New Zealand 2000–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population; Note: Acute and arranged admissions only

Trends in Hospital Admissions by Ethnicity

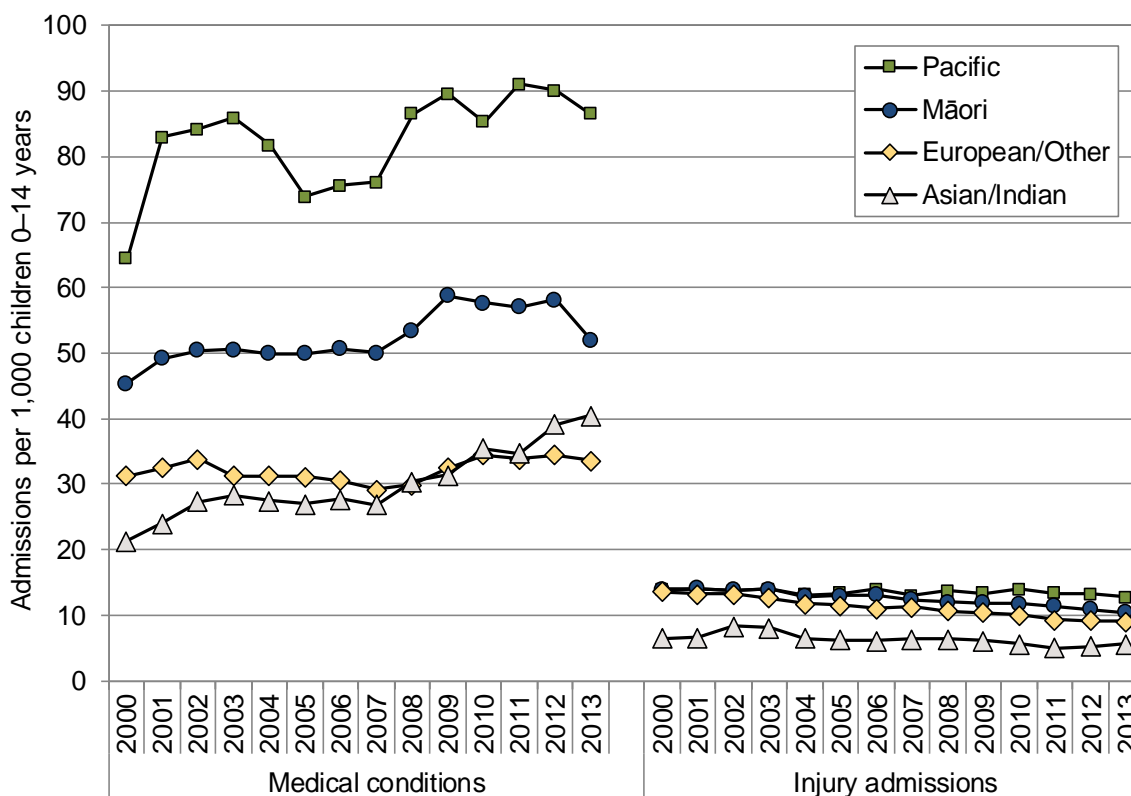
Medical conditions: During 2000–2013, hospitalisations for medical conditions with a social gradient were consistently higher for Pacific and Māori compared to European/Other and Asian/Indian children. For Pacific children, admissions increased during the early 2000s, reached a peak in 2003 and then declined. An upswing in rates was again evident during 2007–2009. For Māori children, rates were static during the mid-2000s, but then increased during 2007–2009, while the rates were relatively static during the mid-2000s for European/Other children and for Asian/Indian children, they did increase from 2007 (Figure 172).

Injuries: During 2000–2013, injury admissions with a social gradient were higher for Pacific and Māori, followed by European/Other, and Asian/Indian children. Admission rates declined for Pacific, Māori, and European/Other children during 2000–2013; however, the rate of decline was faster for European/Other, followed by Māori children. Thus ethnic differences were greater in 2013 than in 2000. Trends for Asian/Indian children were more variable (Figure 172).

Trends in Mortality by Ethnicity

During 2000–2011, SUDI mortality was consistently higher for Māori infants, followed by Pacific, compared to European/Other infants, while the mortality rate from medical conditions with a social gradient was generally higher for Māori and Pacific children than for European/Other children. The mortality rate from injuries with a social gradient was higher for Māori children than for Pacific, and European/Other children (Figure 173).

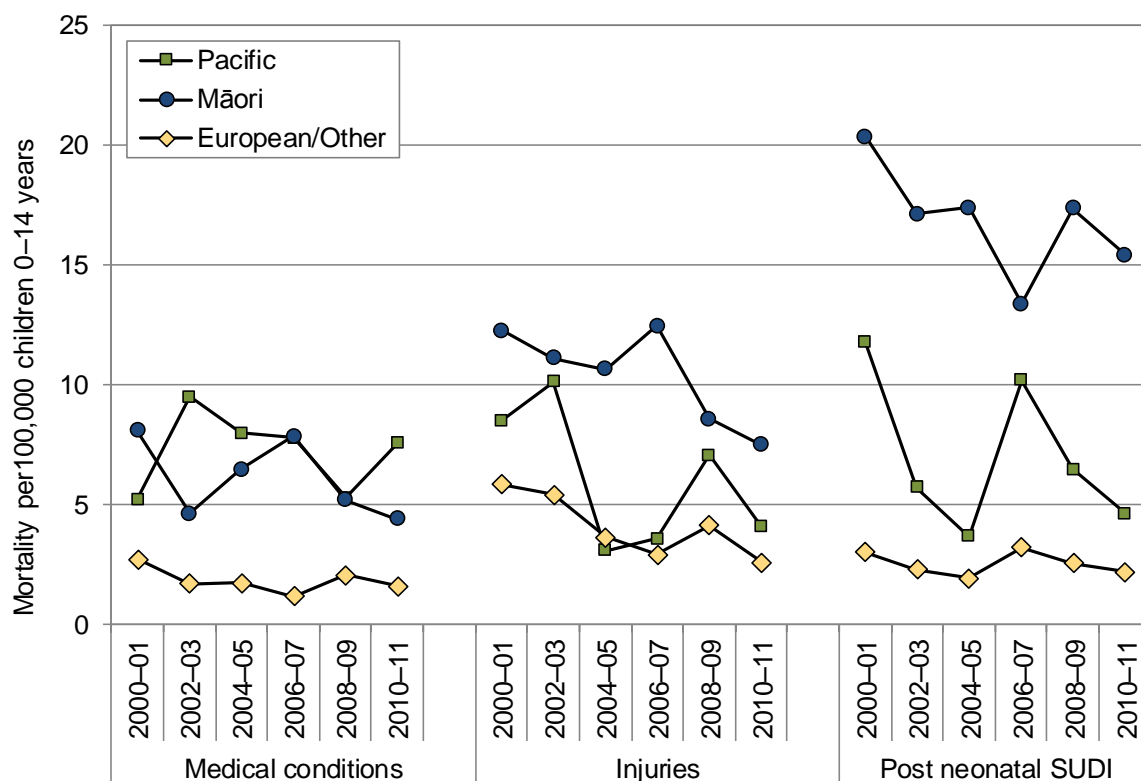
Figure 172. Hospital admissions for conditions with a social gradient in children aged 0–14 years (excluding neonates) by ethnicity, New Zealand 2000–2013



Source: Numerator: National Minimum Dataset (neonates removed); Denominator: Statistics NZ Estimated Resident Population; Note: *Medical conditions*: acute and arranged admissions only; *Injury*: excludes emergency department cases; Ethnicity is Level 1 prioritised



Figure 173. Mortality from conditions with a social gradient in children aged 0–14 years (excluding neonates) by ethnicity, New Zealand 2000–2011



Source: Numerator: National Mortality Collection (neonates removed); Denominator: Statistics NZ Estimated Resident Population; Note: SUDI deaths are for infants aged 28–364 days only; Ethnicity is Level 1 prioritised

Distribution of Hospital Admissions by Ethnicity, Gender and NZDep Index Decile

Medical conditions: During 2009–2013, hospital admissions for medical conditions with a social gradient, were *significantly higher* for Pacific, Māori and Asian/Indian compared to European/Other children. Admissions were also *significantly higher* for males, and for those from the less to most deprived areas (NZDep06 deciles 3–10) (**Table 67**).

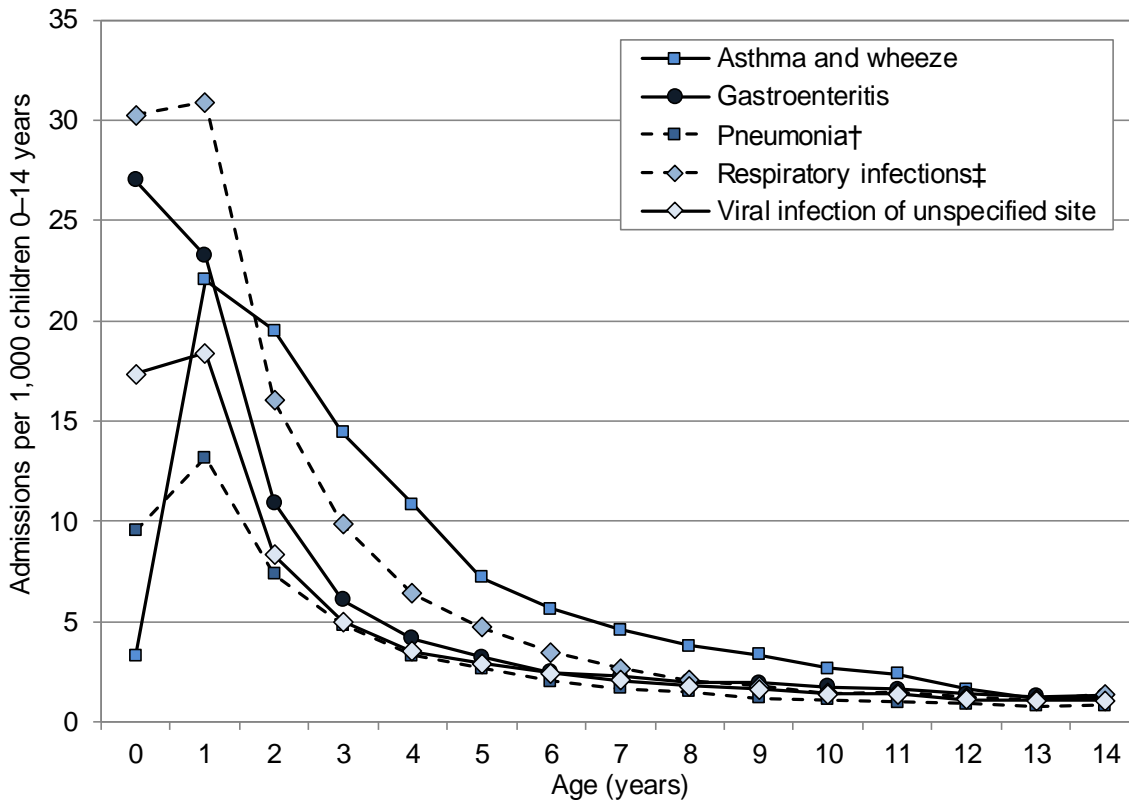
Injuries: Similarly during 2009–2013, hospital admissions for injuries with a social gradient were *significantly higher* for Pacific and Māori compared to European/Other children and *significantly lower* for Asian/Indian children. Admissions were also *significantly higher* for males, and for those from average to most deprived areas (NZDep06 deciles 5–10) (**Table 67**). While the magnitude of the social differences appeared less for injury than for medical admissions, there are technical reasons for this (See Note 4 in Methods box).

Hospital Admissions for Selected Conditions

The top 70% of hospital admissions for conditions with a social gradient among children aged 0–14 years are respiratory and infectious conditions. The majority of the most common causes are found among children under 5 years of age with the exception of bronchiolitis where 85% of the cases are infants under 1 year of age (**Figure 174**).



Figure 174. Hospital admissions for selected conditions with a social gradient in children aged 0–14 years (excluding neonates), by age, New Zealand 2009–2013



Source: Numerator: National Minimum Dataset (neonates removed, acute and arranged admissions only); Denominator: Statistics NZ Estimated Resident Population; Note: † pneumonia includes: bacteria, non-viral, viral and unspecified pneumonia; ‡ respiratory infections includes: acute upper respiratory infections, croup/laryngitis/tracheitis and unspecified acute lower respiratory infections

Distribution of Mortality by Ethnicity, Gender and NZDep Index Decile

During 2007–2011, mortality from medical conditions with a social gradient, when compared to European/Other children, was *significantly higher* for Pacific and Māori children. The mortality rate was also *significantly higher* for males, and for those from the average to most deprived areas (NZDep06 deciles 5–10) (**Table 68**).

Mortality from injuries with a social gradient was *significantly higher* for Māori children, when compared to European/Other children, and *significantly lower* for Asian/Indian children. Mortality was also *significantly higher* for males, and for those from the more deprived areas (NZDep06 deciles 7–10) (**Table 68**). Differences in SUDI mortality are considered in the Infant Mortality section.



Table 67. Distribution of hospital admissions with a social gradient in children aged 0–14 years (excluding neonates) by ethnicity, gender and NZ Deprivation Index decile, New Zealand 2009–2013

Hospital admissions in children 0–14 years							
Medical conditions							
Variable	Rate	Rate ratio	95% CI	Variable	Rate	Rate ratio	95% CI
NZ Deprivation Index decile				NZ Deprivation Index quintile			
Decile 1	25.78	1.00		Deciles 1–2	25.97	1.00	
Decile 2	26.14	1.01	0.99–1.04	Deciles 3–4	30.76	1.18	1.16–1.21
Decile 3	30.16	1.17	1.14–1.20	Deciles 5–6	38.82	1.49	1.47–1.52
Decile 4	31.38	1.22	1.19–1.25	Deciles 7–8	50.68	1.95	1.92–1.98
Decile 5	36.42	1.41	1.38–1.45	Deciles 9–10	70.94	2.73	2.69–2.77
Decile 6	41.43	1.61	1.57–1.65	Prioritised ethnicity			
Decile 7	47.55	1.84	1.80–1.89	Māori	56.71	1.68	1.66–1.70
Decile 8	53.39	2.07	2.03–2.12	Pacific	88.52	2.62	2.59–2.65
Decile 9	65.45	2.54	2.48–2.59	Asian/Indian	36.39	1.08	1.06–1.10
Decile 10	75.86	2.94	2.88–3.00	European/Other	33.76	1.00	
Gender							
Female	40.52	1.00					
Male	49.55	1.22	1.21–1.23				
Injuries							
Variable	Rate	Rate ratio	95% CI	Variable	Rate	Rate ratio	95% CI
NZ Deprivation Index decile				NZ Deprivation Index quintile			
Decile 1	8.03	1.00		Deciles 1–2	8.01	1.00	
Decile 2	7.99	1.00	0.95–1.04	Deciles 3–4	8.07	1.01	0.97–1.04
Decile 3	7.75	0.97	0.92–1.01	Deciles 5–6	8.83	1.10	1.07–1.14
Decile 4	8.38	1.04	1.00–1.10	Deciles 7–8	10.08	1.26	1.22–1.30
Decile 5	8.54	1.06	1.02–1.11	Deciles 9–10	13.46	1.68	1.63–1.73
Decile 6	9.15	1.14	1.09–1.19	Prioritised ethnicity			
Decile 7	9.65	1.20	1.15–1.26	Māori	11.23	1.18	1.15–1.20
Decile 8	10.46	1.30	1.25–1.36	Pacific	13.31	1.39	1.35–1.43
Decile 9	12.48	1.55	1.49–1.62	Asian/Indian	5.48	0.57	0.55–0.60
Decile 10	14.34	1.79	1.72–1.86	European/Other	9.56	1.00	
Gender							
Female	8.06	1.00					
Male	11.77	1.46	1.43–1.49				

Source: Numerator: National Minimum Dataset (neonates removed); Denominator: Statistics NZ Estimated Resident Population; Note: *Medical conditions*: acute and arranged admissions only; *Injury*: excludes emergency department cases; Rates are per 1,000; Rate ratios are unadjusted; Ethnicity is Level 1 prioritised; Decile is NZDep06



Table 68. Distribution of mortality with a social gradient in children aged 0–14 years by ethnicity, gender and NZ Deprivation Index quintile, New Zealand 2007–2011

Mortality in children 0–14 years							
Medical conditions							
Variable	Rate	Rate ratio	95% CI	Variable	Rate	Rate ratio	95% CI
NZ Deprivation Index quintile				Prioritised ethnicity			
Deciles 1–2	1.07	1.00		Māori	6.01	3.69	2.50–5.44
Deciles 3–4	1.89	1.77	0.78–4.05	Pacific	7.29	4.47	2.81–7.13
Deciles 5–6	2.71	2.55	1.18–5.51	Asian/Indian	0.93	0.57	0.20–1.60
Deciles 7–8	2.90	2.73	1.28–5.80	European/Other	1.63	1.00	
Deciles 9–10	6.36	5.97	2.98–12.0	Gender			
				Female	2.51	1.00	
				Male	3.83	1.52	1.09–2.13
Injuries							
Variable	Rate	Rate ratio	95% CI	Variable	Rate	Rate ratio	95% CI
NZ Deprivation Index quintile				Prioritised ethnicity			
Deciles 1–2	2.37	1.00		Māori	8.70	2.38	1.79–3.17
Deciles 3–4	4.41	1.86	1.07–3.23	Pacific	5.41	1.48	0.94–2.34
Deciles 5–6	3.30	1.40	0.79–2.48	Asian/Indian	1.63	0.45	0.21–0.96
Deciles 7–8	4.30	1.82	1.06–3.11	European/Other	3.66	1.00	
Deciles 9–10	8.80	3.72	2.29–6.02	Gender			
				Female	3.84	1.00	
				Male	5.92	1.54	1.17–2.02

Source: Numerator: National Mortality Collection (neonates removed); Denominator: Statistics NZ Estimated Resident Population; Note: Rates are per 100,000; Rate ratios are unadjusted; Ethnicity is Level 1 prioritised; Decile is NZDep06

Northern DHBs Distribution and Trends

Northern DHBs vs. New Zealand

Medical Conditions

In the Northland, Auckland and Counties Manukau DHBs during 2009–2013, hospital admissions for medical conditions with a social gradient were *significantly higher* than the New Zealand rate, while in the Waitemata DHB rates were *not significantly* different from the New Zealand rate (**Table 69**).

Injuries

In the Northland and Counties Manukau DHBs during 2009–2013, hospital admissions for injuries with a social gradient were *significantly higher* than the New Zealand rate, while in the Waitemata and Auckland DHBs rates were *significantly lower* (**Table 69**).



Table 69. Hospital admissions for conditions with a social gradient in children aged 0–14 years (excluding neonates), Northern DHBs vs. New Zealand 2009–2013

DHB	Number: total 2009– 2013	Number: annual average	Rate per 1,000	Rate ratio	95% CI
Children 0–14 years					
Medical conditions					
Northland	8,625	1,725	47.77	1.06	1.04–1.08
Waitemata	25,271	5,054	45.32	1.00	0.99–1.02
Auckland	22,097	4,419	53.96	1.20	1.18–1.21
Counties Manukau	31,545	6,309	53.37	1.18	1.17–1.20
New Zealand	203,826	40,765	45.15	1.00	
Injuries					
Northland	1,985	397	10.99	1.10	1.06–1.15
Waitemata	4,857	971	8.71	0.87	0.85–0.90
Auckland	3,687	737	9.00	0.90	0.87–0.93
Counties Manukau	7,036	1,407	11.90	1.19	1.17–1.23
New Zealand	44,975	8,995	9.96	1.00	

Source: Numerator: National Minimum Dataset (neonates removed); Denominator: Statistics NZ Estimated Resident Population; Note: *Medical conditions*: acute and arranged admissions only; *Injury*: exclude emergency department cases

Distribution of Hospital Admissions by Primary Diagnosis

Medical conditions: In Northland and Counties Manukau during 2009–2013, bronchiolitis, asthma and wheeze, and gastroenteritis made the largest individual contributions to hospitalisations for medical conditions with a social gradient, while in the Waitemata and Auckland DHBs asthma and wheeze, gastroenteritis and viral infections of unspecified site were the most frequent reasons for admission. In Infectious and respiratory diseases collectively were responsible for the majority of medical admissions during this period (**Table 70–Table 73**).

Injuries: In all four of the Northern DHBs during 2009–2013, falls, followed by inanimate mechanical forces, were the most frequent reasons for injury admissions with a social gradient, although transport injuries as a group also had a sizeable contribution (**Table 70–Table 73**).



Table 70. Hospital admissions for conditions with a social gradient in children aged 0–14 years (excluding neonates) by primary diagnosis, Northland 2009–2013

Primary diagnosis	Northland			
	Number: total 2009–2013	Number: annual average	Rate per 1,000	Percent of total
Children 0–14 years				
Medical conditions				
Acute bronchiolitis	1,582	316.4	8.76	18.3
Asthma and wheeze	1,103	220.6	6.11	12.8
Gastroenteritis	941	188.2	5.21	10.9
Viral infection of unspecified site	806	161.2	4.46	9.3
Skin infections	754	150.8	4.18	8.7
Acute upper respiratory infections*	681	136.2	3.77	7.9
Pneumonia: bacterial, non-viral	662	132.4	3.67	7.7
Acute lower respiratory infection unspecified	398	79.6	2.20	4.6
Urinary tract infection	270	54.0	1.50	3.1
Epilepsy or status epilepticus	248	49.6	1.37	2.9
Croup/laryngitis/tracheitis/epiglottitis	220	44.0	1.22	2.6
Dermatitis and eczema	160	32.0	0.89	1.9
Otitis media	160	32.0	0.89	1.9
Febrile convulsions	126	25.2	0.70	1.5
Rheumatic fever/heart disease	106	21.2	0.59	1.2
Inguinal hernia	84	16.8	0.47	1.0
Pneumonia: viral	73	14.6	0.40	0.8
Osteomyelitis	65	13.0	0.36	0.8
Bronchiectasis	44	8.8	0.24	0.5
Vaccine preventable diseases	44	8.8	0.24	0.5
Meningitis: viral, other, NOS	40	8.0	0.22	0.5
Meningococcal disease	33	6.6	0.18	0.4
Nutritional deficiencies/anaemias	15	3.0	0.08	0.2
Meningitis: bacterial	10	2.0	0.06	0.1
Northland total	8,625	1,725.0	47.77	100.0
Injuries				
Falls	1,061	212.2	5.88	53.5
Mechanical forces: inanimate	380	76.0	2.10	19.1
Mechanical forces: animate	150	30.0	0.83	7.6
Transport: cyclist	100	20.0	0.55	5.0
Poisoning	98	19.6	0.54	4.9
Thermal injury	79	15.8	0.44	4.0
Transport: vehicle occupant	61	12.2	0.34	3.1
Transport: pedestrian	43	8.6	0.24	2.2
Drowning/submersion	13	2.6	0.07	0.7
Northland total	1,985	397.0	10.99	100.0

Source: Numerator: National Minimum Dataset (neonates removed); Denominator: Statistics NZ Estimated Resident Population; Note: *Medical conditions*: acute and arranged admissions only; *injury*: exclude emergency department cases; *Upper respiratory infections exclude croup; s: suppressed due to small numbers



Table 71. Hospital admissions for conditions with a social gradient in children aged 0–14 years (excluding neonates) by primary diagnosis, Waitemata DHB 2009–2013

Primary diagnosis	Waitemata			
	Number: total 2009–2013	Number: annual average	Rate per 1,000	Percent of total
Children 0–14 years				
Medical conditions				
Asthma and wheeze	3,733	746.6	6.70	14.8
Gastroenteritis	3,633	726.6	6.52	14.4
Viral infection of unspecified site	3,056	611.2	5.48	12.1
Acute bronchiolitis	3,042	608.4	5.46	12.0
Skin infections	2,397	479.4	4.30	9.5
Pneumonia: bacterial, non-viral	2,235	447.0	4.01	8.8
Acute upper respiratory infections*	1,876	375.2	3.36	7.4
Urinary tract infection	1,174	234.8	2.11	4.6
Acute lower respiratory infection unspecified	686	137.2	1.23	2.7
Croup/laryngitis/tracheitis/epiglottitis	678	135.6	1.22	2.7
Epilepsy or status epilepticus	584	116.8	1.05	2.3
Febrile convulsions	418	83.6	0.75	1.7
Dermatitis and eczema	321	64.2	0.58	1.3
Otitis media	310	62.0	0.56	1.2
Pneumonia: viral	237	47.4	0.43	0.9
Osteomyelitis	168	33.6	0.30	0.7
Inguinal hernia	167	33.4	0.30	0.7
Meningitis: viral, other, NOS	162	32.4	0.29	0.6
Vaccine preventable diseases	105	21.0	0.19	0.4
Bronchiectasis	99	19.8	0.18	0.4
Rheumatic fever/heart disease	87	17.4	0.16	0.3
Nutritional deficiencies/anaemias	40	8.0	0.07	0.2
Meningococcal disease	33	6.6	0.06	0.1
Meningitis: bacterial	26	5.2	0.05	0.1
Tuberculosis	4	0.8	0.01	0.0
Waitemata total	25,271	5,054.2	45.32	100.0
Injuries				
Falls	2,399	479.8	4.30	49.4
Mechanical forces: inanimate	1,402	280.4	2.51	28.9
Mechanical forces: animate	302	60.4	0.54	6.2
Transport: cyclist	250	50.0	0.45	5.1
Thermal injury	159	31.8	0.29	3.3
Poisoning	118	23.6	0.21	2.4
Transport: pedestrian	103	20.6	0.18	2.1
Transport: vehicle occupant	102	20.4	0.18	2.1
Drowning/submersion	22	4.4	0.04	0.5
Waitemata total	4,857	971.4	8.71	100.0

Source: Numerator: National Minimum Dataset (Neonates removed); Denominator: Statistics NZ Estimated Resident Population; Note: *Medical conditions*: acute and arranged admissions only; *injury*: exclude emergency department cases; *Upper respiratory infections exclude croup

Table 72. Hospital admissions for conditions with a social gradient in children aged 0–14 years (excluding neonates) by primary diagnosis, Auckland DHB 2009–2013

Primary diagnosis	Auckland DHB			
	Number: total 2009–2013	Number: annual average	Rate per 1,000	Percent of total
Children 0–14 years				
Medical conditions				
Asthma and wheeze	4,063	812.6	9.92	18.4
Gastroenteritis	3,155	631.0	7.70	14.3
Viral infection of unspecified site	2,823	564.6	6.89	12.8
Acute bronchiolitis	2,683	536.6	6.55	12.1
Skin infections	1,999	399.8	4.88	9.0
Pneumonia: bacterial, non-viral	1,787	357.4	4.36	8.1
Acute upper respiratory infections*	1,528	305.6	3.73	6.9
Urinary tract infection	904	180.8	2.21	4.1
Croup/laryngitis/tracheitis/epiglottitis	542	108.4	1.32	2.5
Febrile convulsions	424	84.8	1.04	1.9
Acute lower respiratory infection unspecified	350	70.0	0.85	1.6
Pneumonia: viral	339	67.8	0.83	1.5
Epilepsy or status epilepticus	322	64.4	0.79	1.5
Dermatitis and eczema	273	54.6	0.67	1.2
Otitis media	244	48.8	0.60	1.1
Osteomyelitis	137	27.4	0.33	0.6
Inguinal hernia	113	22.6	0.28	0.5
Meningitis: viral, other, NOS	105	21.0	0.26	0.5
Vaccine preventable diseases	93	18.6	0.23	0.4
Bronchiectasis	72	14.4	0.18	0.3
Rheumatic fever/heart disease	70	14.0	0.17	0.3
Nutritional deficiencies/anaemias	33	6.6	0.08	0.1
Meningococcal disease	18	3.6	0.04	0.1
Meningitis: bacterial	15	3.0	0.04	0.1
Tuberculosis	5	1.0	0.01	0.0
Auckland DHB total	22,097	4,419.4	53.96	100.0
Injuries				
Falls	1,810	362.0	4.42	49.1
Mechanical forces: inanimate	1,216	243.2	2.97	33.0
Mechanical forces: animate	218	43.6	0.53	5.9
Thermal injury	154	30.8	0.38	4.2
Transport: cyclist	112	22.4	0.27	3.0
Transport: pedestrian	81	16.2	0.20	2.2
Poisoning	53	10.6	0.13	1.4
Transport: vehicle occupant	37	7.4	0.09	1.0
Drowning/submersion	6	1.2	0.01	0.2
Auckland DHB total	3,687	737.4	9.00	100.0

Source: Numerator: National Minimum Dataset (neonates removed); Denominator: Statistics NZ Estimated Resident Population; Note: *Medical conditions*: acute and arranged admissions only; *injury*: exclude emergency department cases; *Upper respiratory infections exclude croup; s: suppressed due to small numbers



Table 73. Hospital admissions for conditions with a social gradient in children aged 0–14 years (excluding neonates) by primary diagnosis, Counties Manukau 2009–2013

Primary diagnosis	Counties Manukau			
	Number: total 2009–2013	Number: annual average	Rate per 1,000	Percent of total
Children 0–14 years				
Medical conditions				
Acute bronchiolitis	5,720	1,144.0	9.68	18.1
Asthma and wheeze	4,153	830.6	7.03	13.2
Gastroenteritis	3,879	775.8	6.56	12.3
Skin infections	3,431	686.2	5.80	10.9
Acute upper respiratory infections*	2,710	542.0	4.59	8.6
Viral infection of unspecified site	2,683	536.6	4.54	8.5
Pneumonia: bacterial, non-viral	2,177	435.4	3.68	6.9
Urinary tract infection	1,167	233.4	1.97	3.7
Croup/laryngitis/tracheitis/epiglottitis	835	167.0	1.41	2.6
Acute lower respiratory infection unspecified	794	158.8	1.34	2.5
Pneumonia: viral	664	132.8	1.12	2.1
Epilepsy or status epilepticus	615	123.0	1.04	1.9
Febrile convulsions	615	123.0	1.04	1.9
Dermatitis and eczema	490	98.0	0.83	1.6
Rheumatic fever/heart disease	347	69.4	0.59	1.1
Otitis media	295	59.0	0.50	0.9
Inguinal hernia	177	35.4	0.30	0.6
Bronchiectasis	175	35.0	0.30	0.6
Vaccine preventable diseases	172	34.4	0.29	0.5
Osteomyelitis	166	33.2	0.28	0.5
Meningitis: viral, other, NOS	130	26.0	0.22	0.4
Meningococcal disease	58	11.6	0.10	0.2
Nutritional deficiencies/anaemias	53	10.6	0.09	0.2
Meningitis: bacterial	30	6.0	0.05	0.1
Tuberculosis	9	1.8	0.02	0.0
Counties Manukau total	31,545	6,309.0	53.37	100.0
Injuries				
Falls	3,310	662.0	5.60	47.0
Mechanical forces: inanimate	2,316	463.2	3.92	32.9
Mechanical forces: animate	467	93.4	0.79	6.6
Thermal injury	344	68.8	0.58	4.9
Transport: cyclist	245	49.0	0.41	3.5
Transport: pedestrian	123	24.6	0.21	1.7
Poisoning	121	24.2	0.20	1.7
Transport: vehicle occupant	91	18.2	0.15	1.3
Drowning/submersion	19	3.8	0.03	0.3
Counties Manukau total	7,036	1,407.2	11.83	100.0

Source: Numerator: National Minimum Dataset (Neonates removed); Denominator: Statistics NZ Estimated Resident Population; Note: *Medical conditions*: acute and arranged admissions only; *injury*: exclude emergency department cases; *Upper respiratory infections exclude croup

Distribution of Mortality by Cause

In all four Northern DHBs during 2007–2011, a number of children died from medical conditions and injuries with a social gradient, and from post-neonatal SUDI (**Table 74**).

Table 74. Mortality from conditions with a social gradient in children aged 0–14 years (excluding neonates) by main underlying cause of death, Northern DHBs 2007–2011

Cause of death	Number: total 2007–2011	Number: annual average	Rate per 100,000
Northland			
Medical conditions	9	1.8	5.03
Injuries	17	3.4	9.50
SUDI (infant)	17	3.4	9.50
Northland total	43	8.6	24.03
Waitemata			
Medical conditions	9	1.8	1.64
Injuries	19	3.8	3.46
SUDI (infant)	18	3.6	3.28
Waitemata total	46	9.2	8.37
Auckland DHB			
Medical conditions	11	2.2	2.73
Injuries	6	1.2	1.49
SUDI (infant)	20	4.0	4.96
Auckland DHB total	37	7.4	9.17
Counties Manukau			
Medical conditions	29	5.8	4.95
Injuries	29	5.8	4.95
SUDI (infant)	46	9.2	7.85
Counties Manukau total	104	20.8	17.76

Source: Numerator: National Mortality Collection (neonates removed); Denominator: Statistics NZ Estimated Resident Population; Note: s: suppressed due to small numbers

Trends in Hospital Admissions

Medical conditions: In the Waitemata and Auckland DHBs during 2000–2013, hospital admissions for medical conditions with a social gradient exhibited a general upward trend, while rates in Northland and Counties Manukau were more static. Rates in the Northland, Auckland and Counties Manukau DHBs were generally higher than the New Zealand rate, while in the Waitemata DHB increases saw rates become similar to the New Zealand rate from 2006 onwards (**Figure 175**).

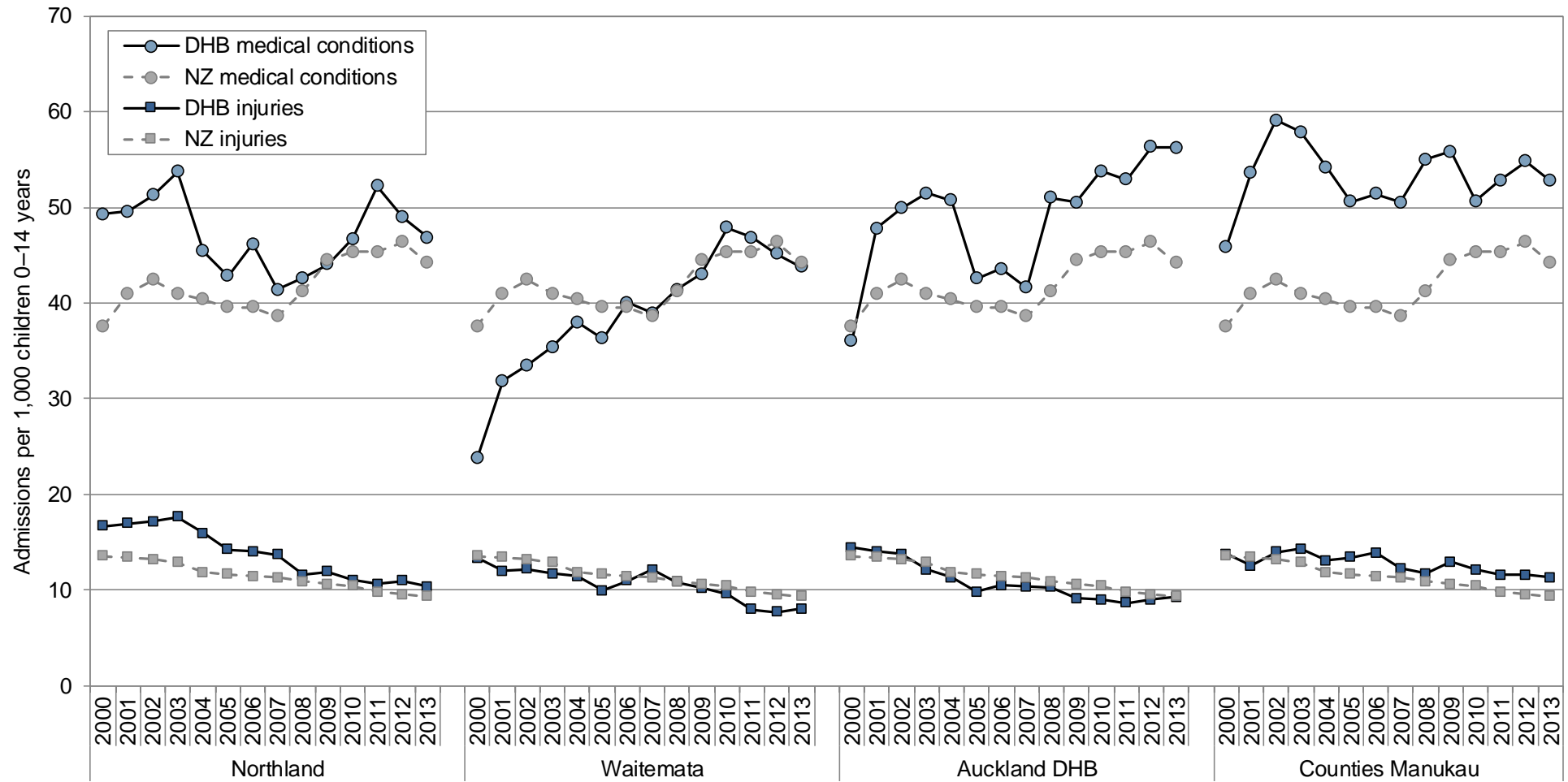
Injuries: In all four of the Northern DHBs during 2000–2013, hospital admissions for injuries with a social gradient exhibited a general downward trend (**Figure 175**).

Trends in Medical Admissions by Ethnicity

In the Waitemata, Auckland and Counties Manukau DHBs during 2000–2013, hospital admissions for medical conditions with a social gradient were consistently higher for Pacific > Māori > European/Other and Asian/Indian children, while in Northland admissions were consistently higher for Māori than for European/Other children (**Figure 176**).

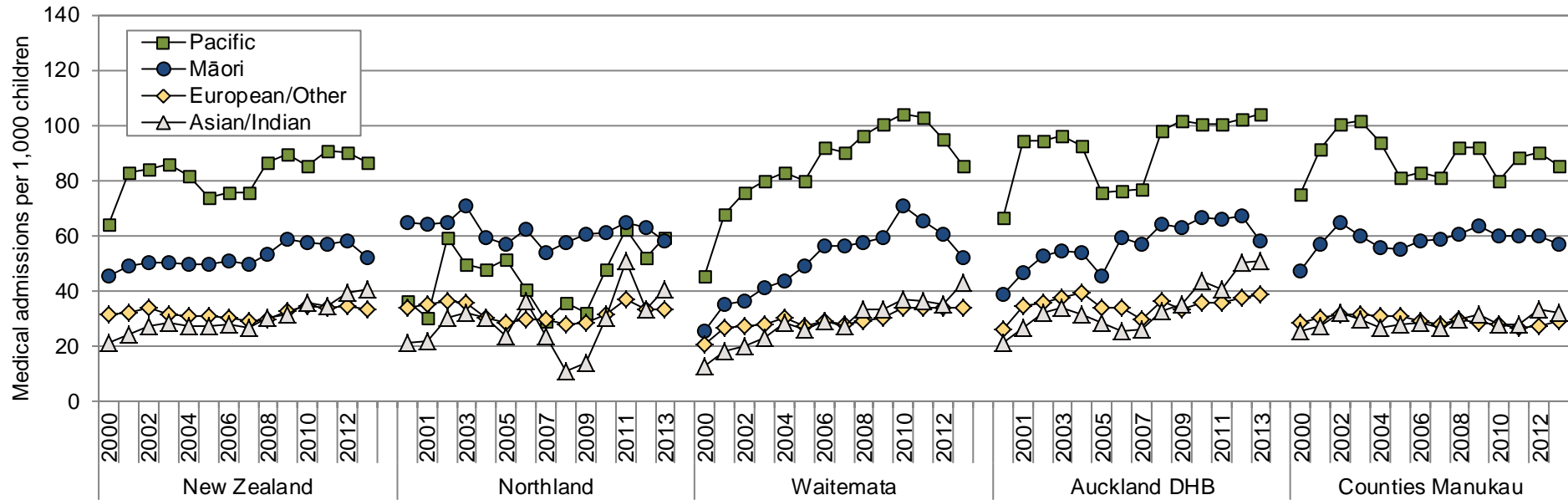


Figure 175. Hospital admissions for conditions with a social gradient in children aged 0–14 years (excluding neonates), Northern DHBs vs. New Zealand 2000–2013



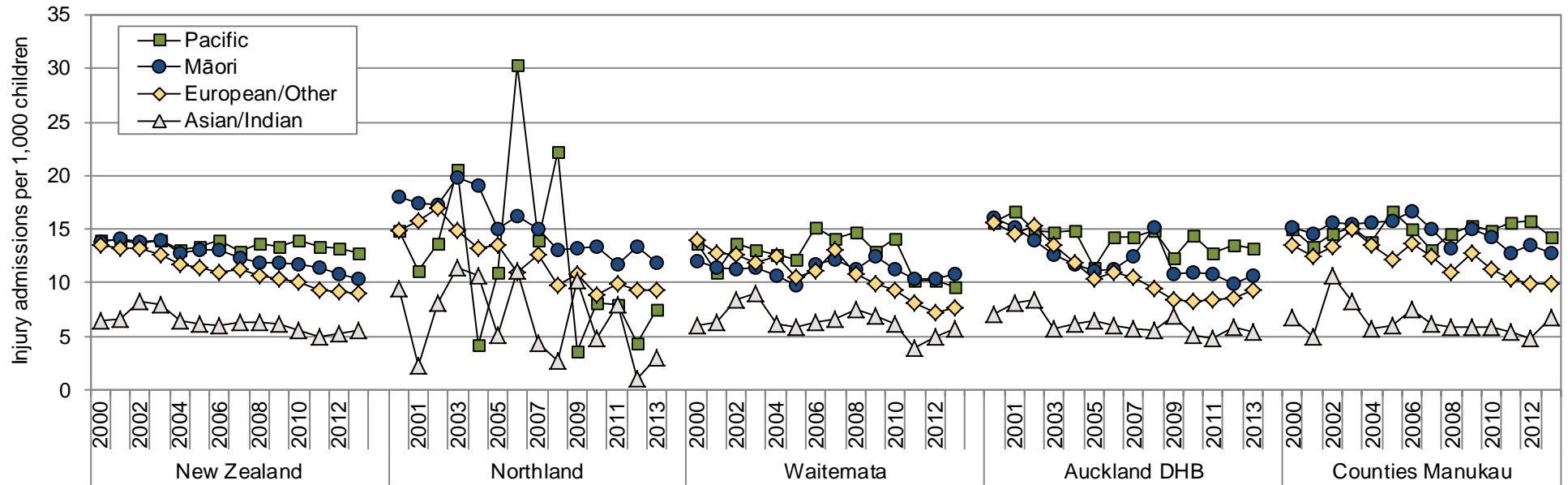
Source: Numerator: National Minimum Dataset (neonates removed); Denominator: Statistics NZ Estimated Resident Population; Note: Medical conditions: acute and arranged only; injury: excludes emergency department cases

Figure 176. Hospital admissions for medical conditions with a social gradient in children aged 0–14 years (excluding neonates) by ethnicity, Northern DHBs vs. New Zealand 2000–2013



Source: Numerator: National Minimum Dataset (acute and arranged admissions only, neonates removed); Denominator: Statistics NZ Estimated Resident Population

Figure 177. Hospital admissions for injuries with a social gradient in children aged 0–14 years (excluding neonates) by ethnicity, Northern DHBs vs. New Zealand 2000–2013



Source: Numerator: National Minimum Dataset (emergency department cases and neonates removed); Denominator: Statistics NZ Estimated Resident Population; Note: Ethnicity is Level 1 prioritised

Trends in Injury Admissions by Ethnicity

In the Waitemata, Auckland and Counties Manukau DHBs during 2000–2013, hospital admissions for injuries with a social gradient were higher for Māori, Pacific and European children than they were for Asian/Indian children, while in Northland admissions were higher for Māori than for European children (**Figure 177**).

Local Policy Documents and Evidence-Based Reviews Relevant to the Prevention of Socioeconomically Sensitive Hospital Admissions and Mortality in Children

Given the complex causal pathways leading to socioeconomic gradients in hospital admissions and mortality during childhood, it is likely that an integrated policy framework covering a range of areas (e.g. housing, income support, exposure to second-hand cigarette smoke, immunisation) will be required, if reductions in admissions and mortality are to be achieved. **Table 12** on page 77 thus provides a brief overview of local policy documents and evidence-based reviews which consider policies to address the social determinants of health, while **Table 20** on page 106 reviews documents which consider the relationship between housing and health. In addition **Table 55** on page 304 reviews publications focused on the prevention of second-hand cigarette exposure in children, while **Table 52** on page 294 considers publications relevant to the cessation of smoking in pregnancy. Finally **Table 31** on page 196 reviews publications relevant to immunisation and interventions aimed at increasing immunisation coverage.



INFANT MORTALITY AND SUDDEN UNEXPECTED DEATH IN INFANCY

Introduction

Infant mortality, defined as the death of a child before his or her first birthday, is widely used as an indicator of the health of a country [373]. In a recent OECD report, New Zealand's infant mortality rates were shown to be lower than those in the United States, Turkey, Chile and Mexico, but higher than those of the rest of the OECD countries for 2009–2011 [374]. Mortality is higher during the first year of life than at any other time during childhood and adolescence in New Zealand [375]. Around half of all infant deaths occur in the first week of life [376].

The past sixty years have seen a steady decline in New Zealand's infant mortality rates, from 25.7 per 1,000 live births in 1953 to 4.9 in 2003, but the rate of decline has slowed over the past decade. The infant mortality rate in 2013 was 4.4 per 1,000 [377]. Infant mortality rates are generally higher for Pacific and Māori infants and for males [378]. There are significant socioeconomic inequalities and in 2008 and 2009, the infant mortality rate in the most deprived NZ Deprivation Index quintile was over twice that in the least deprived quintile [379]. The causes of infant mortality differ markedly with the age of the infant so total infant mortality rates are of limited utility for guiding population health interventions. For neonates (babies in the first 27 days of life), prematurity is a major cause of death, often in association with extremely low birthweight [379] and congenital malformations are also a common cause of death. Sudden Unexpected Death in Infancy (SUDI), and congenital anomalies are the most common causes of death in the post neonatal period (28 days to one year) [380].

The following section uses information from the National Mortality Collection to review neonatal, post neonatal, and total infant mortality rates, and SUDI rates since 1990.

Data Source and Methods

Definition

1. *Total infant mortality: Death of a live born infant prior to 365 days of life*
2. *Neonatal mortality: Death of a live born infant in the first 27 days of life*
3. *Post neonatal mortality: Death of a live born infant after 27 days but prior to 365 days of life*
4. *Sudden Unexpected Death in Infancy: Death of a live born infant <365 days of life, where the cause of death is Sudden Infant Death Syndrome (SIDS), Accidental suffocation/strangulation in bed, Inhalation of gastric contents/food, or Ill-defined/unspecified causes*

Data Sources

Numerator: National Mortality Collection: All deaths in the first year of life, using the definitions outlined above. Cause of death was derived from the ICD-10-AM main underlying cause of death as follows: Congenital anomalies: CVS (Q20); Congenital anomalies: CNS (Q00–Q07); Congenital anomalies: Other (remainder of Q00–Q99); Intrauterine/Birth asphyxia (P20–P21); Extreme prematurity (P07.2); Other perinatal conditions (P00–P96 excluding P07.2 and P20–P21); SUDI: SIDS (R95); SUDI: Unspecified (R96, R98, R99); SUDI: Suffocation/strangulation in bed (W75); SUDI: Inhalation of gastric contents/food (W78, W79); Injury/Poisoning (V01–Y36).

Denominator: Birth Registration Dataset (live births only)

Notes on Interpretation

Note 1: SUDI and SIDS: SIDS is defined as “the sudden unexpected death of an infant <1 year of age, with onset of the fatal episode apparently occurring during sleep, and that remains unexplained after a thorough investigation, including performance of a complete autopsy and review of the circumstances of death and the clinical history” [381]. Issues have emerged with defining SIDS, possibly as the result of pathologists and coroners becoming increasingly reluctant to label a death as SIDS in the context of equivocal death scene findings (e.g. death of an infant who had been co-sleeping with a parent who had recently consumed alcohol [382]). This has resulted in a fall in the number of SIDS deaths, and a rise in the number of deaths attributed to “suffocation/strangulation in bed” or “unspecified causes”.

Note 2: In New Zealand, while SIDS rates have declined, there are still large ethnic differences and SIDS rates are six times higher for Māori infants than for European infants [2].

Note 3: Two additional codes were added to the SUDI indicator in 2013 (W78: Inhalation of gastric contents; and W79: Inhalation and ingestion of food causing obstruction of the respiratory tract) to ensure consistency with the Child and Youth Mortality Review Committee's SUDI reporting. As a result, the rates in this section are not directly comparable with those presented in NZCYES reports prior to 2013. See **Appendix 5** for an overview of the National Mortality Collection.



Total Infant, Neonatal and Post Neonatal Mortality

New Zealand Distribution and Trends

Distribution by Cause

In New Zealand during 2007–2011, extreme prematurity, and congenital anomalies were the leading causes of neonatal mortality, although intrauterine/birth asphyxia also made a significant contribution. SUDI was the leading cause of post neonatal mortality, followed by congenital anomalies (**Table 75**).

Table 75. Neonatal and post neonatal mortality by cause of death, New Zealand 2007–2011

Cause of death	Number: Total 2007–2011	Number: Annual average	Rate	Percent of deaths
New Zealand				
Neonatal mortality				
Extreme prematurity	246	49.2	76.73	25.1
Congenital anomalies: CVS	61	12.2	19.03	6.2
Congenital anomalies: CNS	45	9.0	14.04	4.6
Congenital anomalies: Chromosomal	38	7.6	11.85	3.9
Congenital anomalies: other	104	20.8	32.44	10.6
Intrauterine/birth asphyxia	32	6.4	9.98	3.3
Other perinatal conditions	377	75.4	117.59	38.4
SUDI: SIDS	12	2.4	3.74	1.2
SUDI: all other types	25	5.0	7.80	2.5
Injury/poisoning	6	1.2	1.87	0.6
Other causes	36	7.2	11.23	3.7
Total neonatal mortality	982	196.4	306.29	100.0
Post neonatal mortality				
SUDI: SIDS	147	29.4	45.85	22.0
SUDI: suffocation/strangulation in bed	108	21.6	33.69	16.2
SUDI: all other types	16	3.2	4.99	2.4
Congenital anomalies: CVS	51	10.2	15.91	7.6
Congenital anomalies: Chromosomal	27	5.4	8.42	4.0
Congenital anomalies: CNS	8	1.6	2.50	1.2
Congenital anomalies: other	38	7.6	11.85	5.7
Other perinatal conditions	75	15.0	23.39	11.2
Injury/poisoning	29	5.8	9.05	4.3
Other causes	169	33.8	52.71	25.3
Total post neonatal mortality	668	133.6	208.35	100.0
New Zealand total	1,650	330.0	514.64	

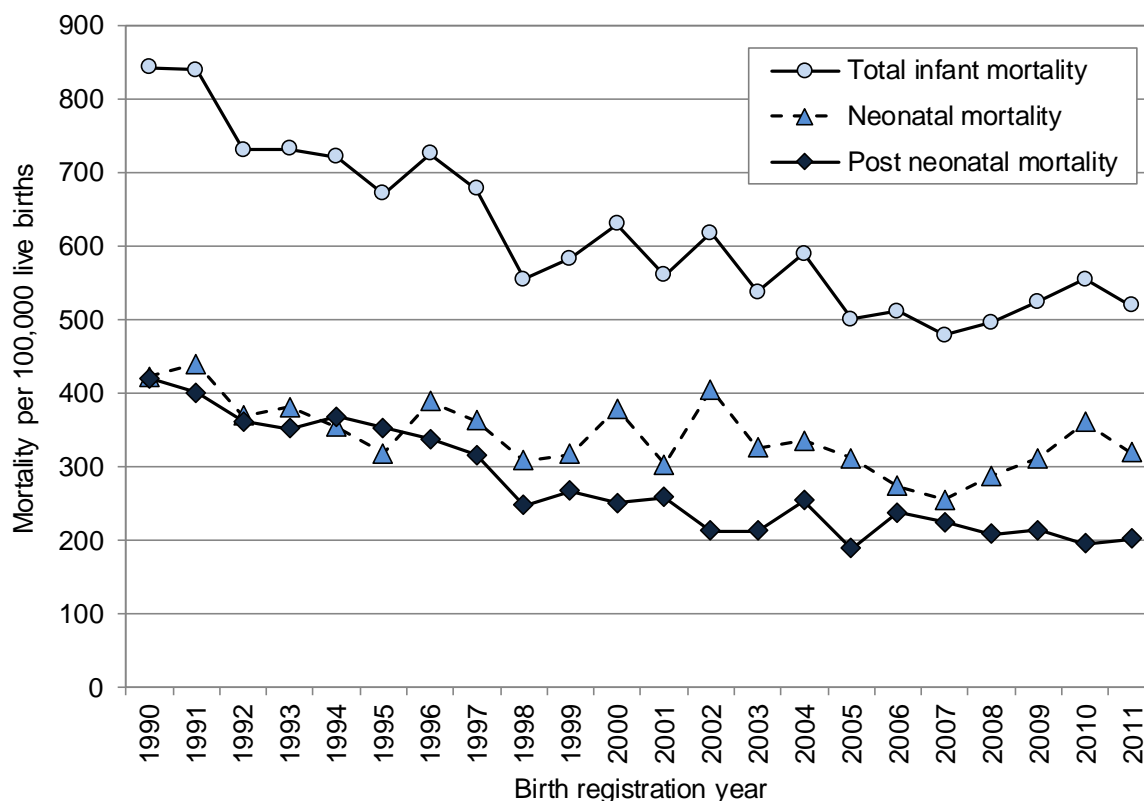
Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Note: CVS = Cardiovascular system; CNS = Central Nervous System; SUDI = Sudden Unexpected Death in Infancy; SIDS = Sudden Infant Death Syndrome; Rates per 100,000 live births



New Zealand Trends

In New Zealand during the 1990s neonatal and post neonatal mortality both declined. While there was some year to year variation during the 2000s, neonatal and post neonatal mortality rates in 2011 were very similar to what they were in the early 2000s (**Figure 178**).

Figure 178. Total infant, neonatal and post neonatal mortality, New Zealand 1990–2011



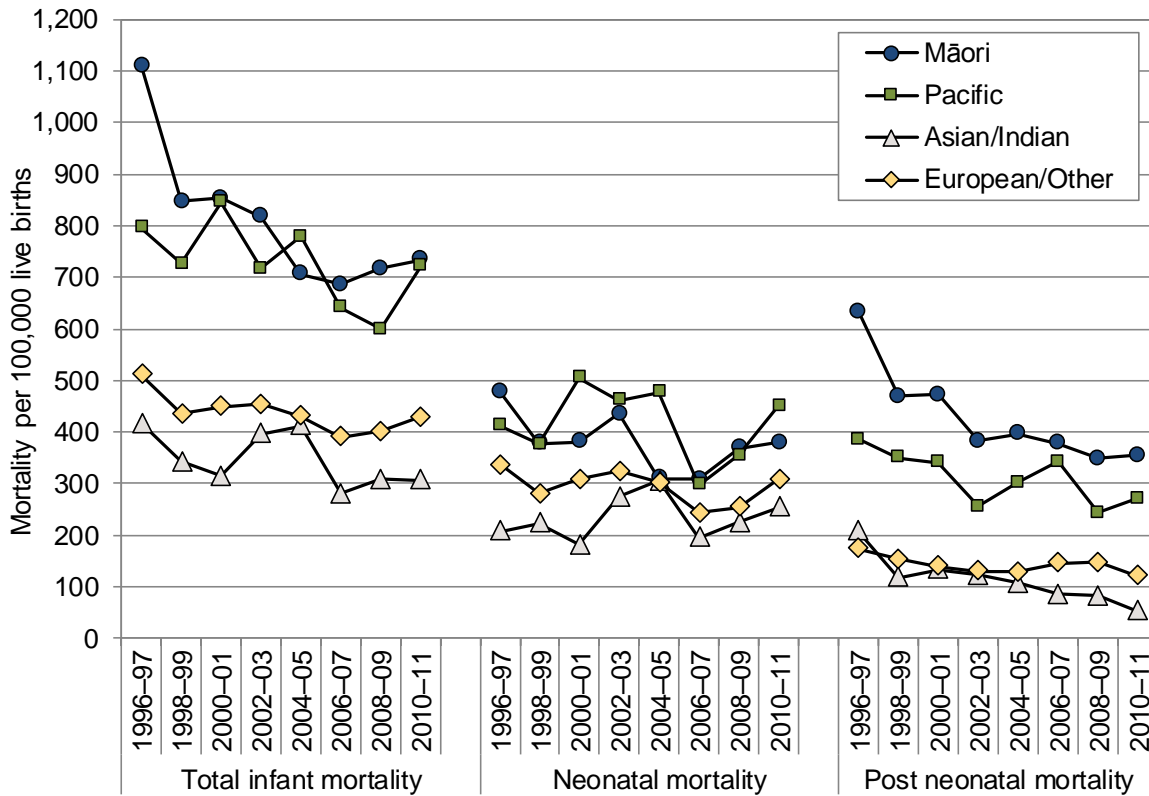
Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset

Trends by Ethnicity

In New Zealand during 1996–2011, while there was some year-to-year variation, neonatal mortality was generally higher for Pacific and Māori infants than for European/Other and Asian/Indian infants. Post neonatal mortality remained consistently higher for Māori and Pacific infants than for European/Other and Asian/Indian infants (**Figure 179**).



Figure 179. Total infant, neonatal and post neonatal mortality by ethnicity, New Zealand 1996–2011



Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Note: Ethnicity is Level 1 prioritised

Distribution by NZDep Index decile, Maternal age, Ethnicity, Gender, and Gestation at birth

Neonatal mortality: In New Zealand during 2007–2011, neonatal mortality was *significantly higher* for Pacific and Māori infants than for European/Other infants, for males, and for those from less deprived to more deprived areas (NZDep deciles 3–10). Rates were also *significantly higher* for preterm babies, and the babies of younger (<20 years) mothers (Table 76).

Post neonatal mortality: During 2007–2011, post neonatal mortality was also *significantly higher* for Māori and Pacific infants than for European/Other and Asian/Indian infants, for males, and for those from average to more deprived areas (NZDep deciles 5–10). Rates were also *significantly higher* for preterm babies, and the babies of younger (<20 years) mothers (Table 76)



Table 76. Distribution of neonatal and post neonatal mortality by NZ Deprivation Index decile, maternal age, ethnicity, gender, and gestation at birth, New Zealand 2007–2011

Variable	Rate	Rate ratio	95% CI	Variable	Rate	Rate ratio	95% CI
Neonatal mortality							
NZ Deprivation Index decile				Ethnicity			
Deciles 1–2	169.6	1.00		Māori	353.6	1.28	1.11–1.48
Deciles 3–4	251.4	1.48	1.12–1.96	Pacific	386.0	1.40	1.16–1.70
Deciles 5–6	265.4	1.56	1.20–2.04	Asian/Indian	222.1	0.81	0.63–1.03
Deciles 7–8	317.0	1.87	1.45–2.41	European/Other	275.4	1.00	
Deciles 9–10	434.2	2.56	2.01–3.25	Gender			
Maternal age group				Female	276.8	1.00	
<20 years	534.7	1.00		Male	334.2	1.21	1.06–1.37
20–24 years	364.7	0.68	0.55–0.85	Gestation at birth			
25–29 years	274.2	0.51	0.41–0.64	20–36 weeks	2,880.1	36.37	31.37–42.16
30–34 years	235.7	0.44	0.35–0.55	37+ weeks	79.2	1.00	
35+ years	292.0	0.55	0.44–0.68				
Post neonatal mortality							
NZ Deprivation Index decile				Ethnicity			
Deciles 1–2	100.5	1.00		Māori	356.7	2.61	2.20–3.10
Deciles 3–4	115.0	1.14	0.78–1.67	Pacific	271.3	1.98	1.56–2.52
Deciles 5–6	161.9	1.61	1.14–2.28	Asian/Indian	63.4	0.46	0.30–0.72
Deciles 7–8	189.1	1.88	1.36–2.61	European/Other	136.7	1.00	
Deciles 9–10	367.2	3.65	2.70–4.95	Gender			
Maternal age group				Female	177.9	1.00	
<20 years	457.7	1.00		Male	237.1	1.33	1.14–1.55
20–24 years	342.5	0.75	0.59–0.95	Gestation at birth			
25–29 years	179.0	0.39	0.30–0.50	20–36 weeks	833.2	5.93	5.01–7.02
30–34 years	126.2	0.28	0.21–0.36	37+ weeks	140.5	1.00	
35+ years	121.9	0.27	0.20–0.35				

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Note: Rates are per 100,000 live births; Rate ratios are unadjusted; Ethnicity is Level 1 prioritised; decile is NZDep06

Northern DHBs Distribution and Trends

Distribution by Cause

In Northland and the Waitemata DHB during 2007–2011, extreme prematurity and congenital anomalies were the most frequent causes of neonatal mortality, while SUDI was the most frequent cause of post neonatal mortality (**Table 77**).



Table 77. Neonatal and post neonatal mortality by cause, Northland and Waitemata DHBs 2007–2011

Cause of death	Number: total 2007– 2011	Number: annual average	Rate per 100,000	Percent of deaths
Northland				
Neonatal mortality				
Extreme prematurity	15	3.0	128.31	30.0
Congenital anomalies	10	2.0	85.54	20.0
Intrauterine/birth asphyxia	4	0.8	34.22	8.0
Other perinatal conditions	15	3.0	128.31	30.0
SUDI: Suffocation/strangulation in bed	3	0.6	25.66	6.0
SUDI: All other types	3	0.6	25.66	6.0
Total neonatal mortality	50	10.0	427.72	100.0
Post neonatal mortality				
SUDI: SIDS	9	1.8	76.99	27.3
SUDI: Suffocation/strangulation in bed	8	1.6	68.43	24.2
Congenital anomalies	3	0.6	25.66	9.1
Other causes	13	2.6	111.21	39.4
Total post neonatal mortality	33	6.6	282.29	100.0
Northland total	83	16.6	710.01	
Waitemata				
Neonatal mortality				
Extreme prematurity	12	2.4	30.42	17.4
Intrauterine/birth asphyxia/other perinatal conditions	32	6.4	81.12	46.4
Congenital anomalies: CVS	9	1.8	22.81	13.0
Congenital anomalies: Chromosomal	4	0.8	10.14	5.8
Congenital anomalies: all other	5	1.0	12.67	7.2
SUDI: All types	4	0.8	10.14	5.8
Other causes	3	0.6	7.60	4.3
Total neonatal mortality	69	13.8	174.90	100.0
Post neonatal mortality				
SUDI: SIDS	10	2.0	25.35	19.2
SUDI: All other types	8	1.6	20.28	15.4
Congenital anomalies: CVS	6	1.2	15.21	11.5
Congenital anomalies: Chromosomal	3	0.6	7.60	5.8
Congenital anomalies: all other	4	0.8	10.14	7.7
Other perinatal conditions	6	1.2	15.21	11.5
Other causes	15	3.0	38.02	28.8
Total post neonatal mortality	52	10.4	131.81	100.0
Waitemata total	121	24.2	306.72	

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Note: CVS = Cardiovascular system; CNS = Central Nervous System; SUDI = Sudden Unexpected Death in Infancy; SIDS = Sudden Infant Death Syndrome; Rates per 100,000 live births



Distribution by Cause

In the Auckland and Counties Manukau DHBs during 2007–2011, extreme prematurity and congenital anomalies were the most frequent causes of neonatal mortality, while SUDI was the most frequent cause of post neonatal mortality (**Table 78, Table 80**).

Table 78. Neonatal and post neonatal mortality by cause, Counties Manukau 2007–2011

Cause of death	Number: total 2007– 2011	Number: annual average	Rate per 100,000	Percent of deaths
Counties Manukau				
Neonatal mortality				
Extreme prematurity	60	12.0	136.03	34.9
Congenital anomalies: Chromosomal	7	1.4	15.87	4.1
Congenital anomalies: CVS	5	1.0	11.34	2.9
Congenital anomalies: CNS	12	2.4	27.21	7.0
Congenital anomalies: other	18	3.6	40.81	10.5
Intrauterine/birth asphyxia	4	0.8	9.07	2.3
Other perinatal conditions	55	11.0	124.69	32.0
SUDI: All types	6	1.2	13.60	3.5
Other causes	5	1.0	11.34	2.9
Total neonatal mortality	172	34.4	389.94	100.0
Post neonatal mortality				
SUDI: SIDS	27	5.4	61.21	22.3
SUDI: Suffocation/strangulation in bed	13	2.6	29.47	10.7
SUDI: unspecified	6	1.2	13.60	5.0
Congenital anomalies: Chromosomal	5	1.0	11.34	4.1
Congenital anomalies: CVS	6	1.2	13.60	5.0
Congenital anomalies: all other	8	1.6	18.14	6.6
Other perinatal conditions	18	3.6	40.81	14.9
Injury/poisoning	4	0.8	9.07	3.3
Other causes	34	6.8	77.08	28.1
Total post neonatal mortality	121	24.2	274.32	100.0
Counties Manukau total	293	58.6	664.26	

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Note: CVS = Cardiovascular system; CNS = Central Nervous System; SUDI = Sudden Unexpected Death in Infancy; SIDS = Sudden Infant Death Syndrome; Rates per 100,000 live births

Northern DHBs vs. New Zealand

In Northland and Counties Manukau during 2007–2011, neonatal mortality rates were *significantly higher* than the New Zealand rate, while in the Waitemata DHB rates were *significantly lower*. During the same period, post-neonatal mortality rates in Counties Manukau were *significantly higher* than the New Zealand rate, while rates in the Waitemata DHB were *significantly lower*. While also higher, differences for Northland did not reach statistical significance (**Table 80**).

Northern DHB Trends

In the Northern DHBs during 1990–2011, total infant and post-neonatal mortality rates exhibited a general downward trend, while trends in neonatal mortality were more variable (**Figure 180–Figure 182**).



Table 79. Neonatal and post neonatal mortality by cause, Auckland DHB 2007–2011

Cause of death	Number: total 2007– 2011	Number: annual average	Rate per 100,000	Percent of deaths
Auckland DHB				
Neonatal mortality				
Extreme prematurity	24	4.8	72.11	25.8
Other perinatal conditions	37	7.4	111.17	39.8
Congenital anomalies: CNS	7	1.4	21.03	7.5
Congenital anomalies: Chromosomal	4	0.8	12.02	4.3
Congenital anomalies: CVS	4	0.8	12.02	4.3
Congenital anomalies: other	9	1.8	27.04	9.7
SUDI: All types	5	1.0	15.02	5.4
Other causes	3	0.6	9.01	3.2
Total neonatal mortality	93	18.6	279.43	100.0
Post neonatal mortality				
SUDI: SIDS	13	2.6	39.06	23.6
SUDI: Suffocation/strangulation in bed	7	1.4	21.03	12.7
Congenital anomalies	8	1.6	24.04	14.5
Other perinatal conditions	6	1.2	18.03	10.9
Injury/poisoning	3	0.6	9.01	5.5
Other causes	18	3.6	54.08	32.7
Total post neonatal mortality	55	11.0	165.25	100.0
Auckland total	148	29.6	444.68	

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Note: CVS = Cardiovascular system; CNS = Central Nervous System; SUDI = Sudden Unexpected Death in Infancy; SIDS = Sudden Infant Death Syndrome; Rates per 100,000 live births

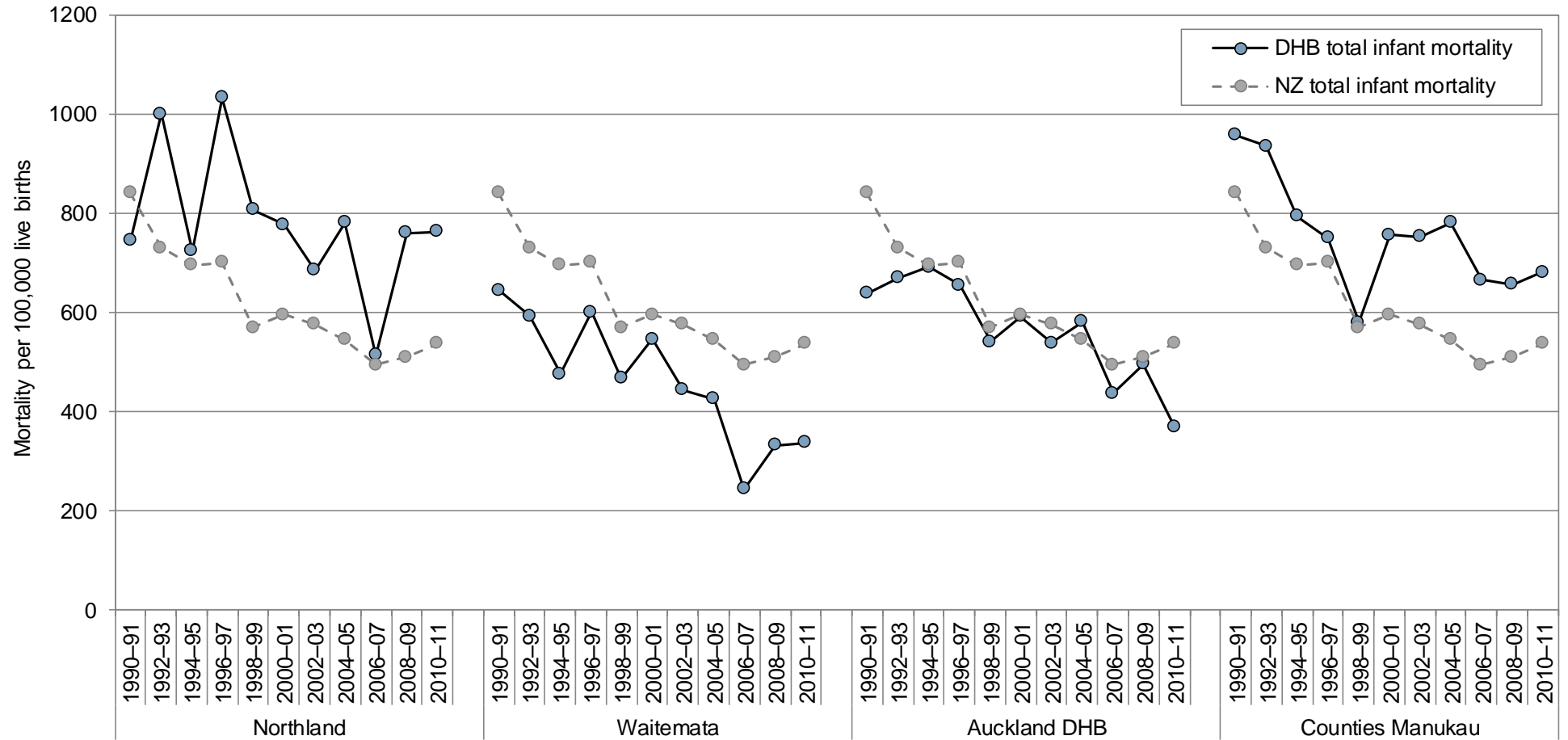
Table 80. Neonatal and post neonatal mortality, Northern DHBs vs. New Zealand 2007–2011

DHB	Number: Total 2007– 2011	Number: Annual average	Rate per 100,000	Rate ratio	95% CI
Neonatal mortality					
Northland	50	10	427.72	1.40	1.05–1.85
Waitemata	69	14	174.90	0.57	0.45–0.73
Auckland	93	19	279.43	0.91	0.74–1.13
Counties Manukau	172	34	389.94	1.27	1.08–1.50
New Zealand	982	196	306.29	1.00	
Post neonatal mortality					
Northland	33	7	282.29	1.35	0.96–1.92
Waitemata	52	10	131.81	0.63	0.48–0.84
Auckland	55	11	165.25	0.79	0.60–1.04
Counties Manukau	121	24	274.32	1.32	1.09–1.60
New Zealand	668	134	208.35	1.00	

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset



Figure 180. Total infant mortality, Northern DHBs vs. New Zealand 1990–2011



Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset

Figure 181. Neonatal mortality, Northern DHBs vs. New Zealand 1990–2011

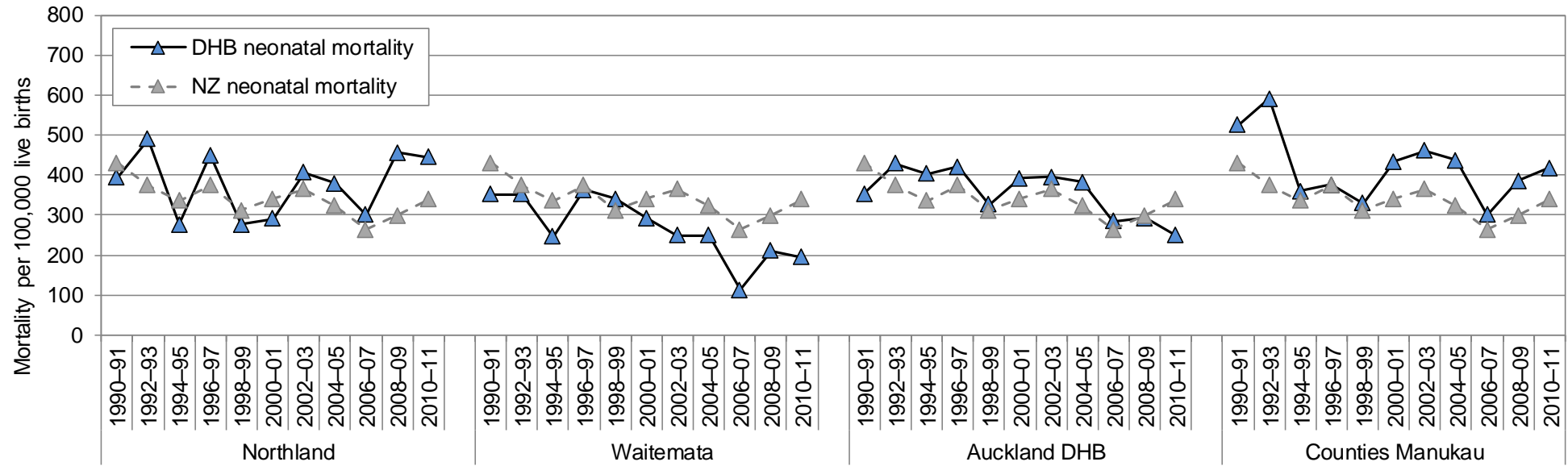
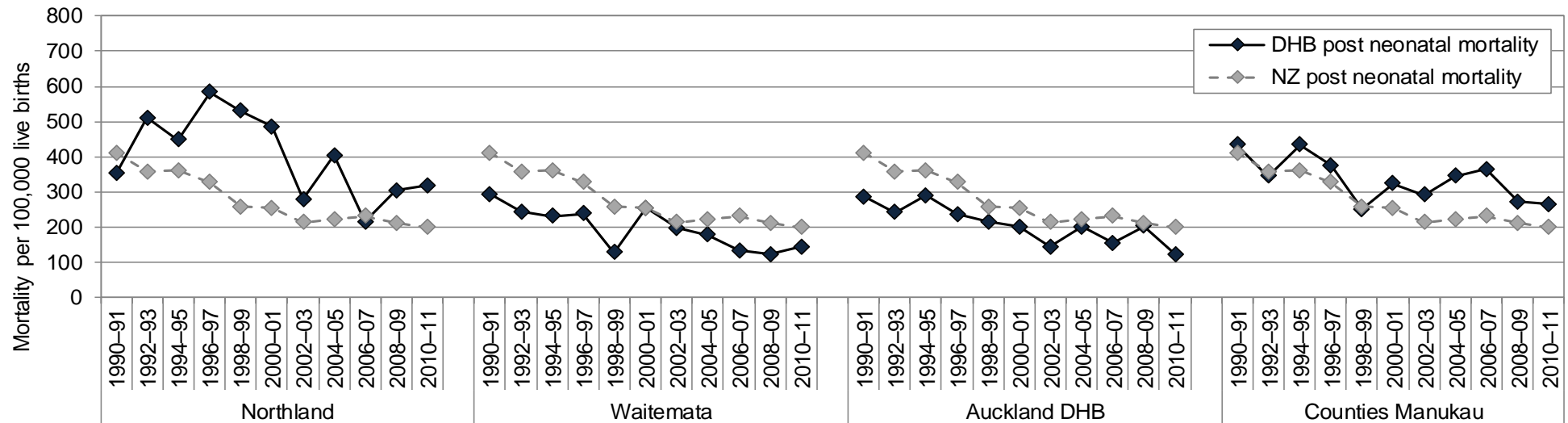


Figure 182. Post neonatal mortality, Northern DHBs vs. New Zealand 1990–2011



Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset

Sudden Unexpected Death in Infancy (SUDI)

New Zealand Distribution and Trends

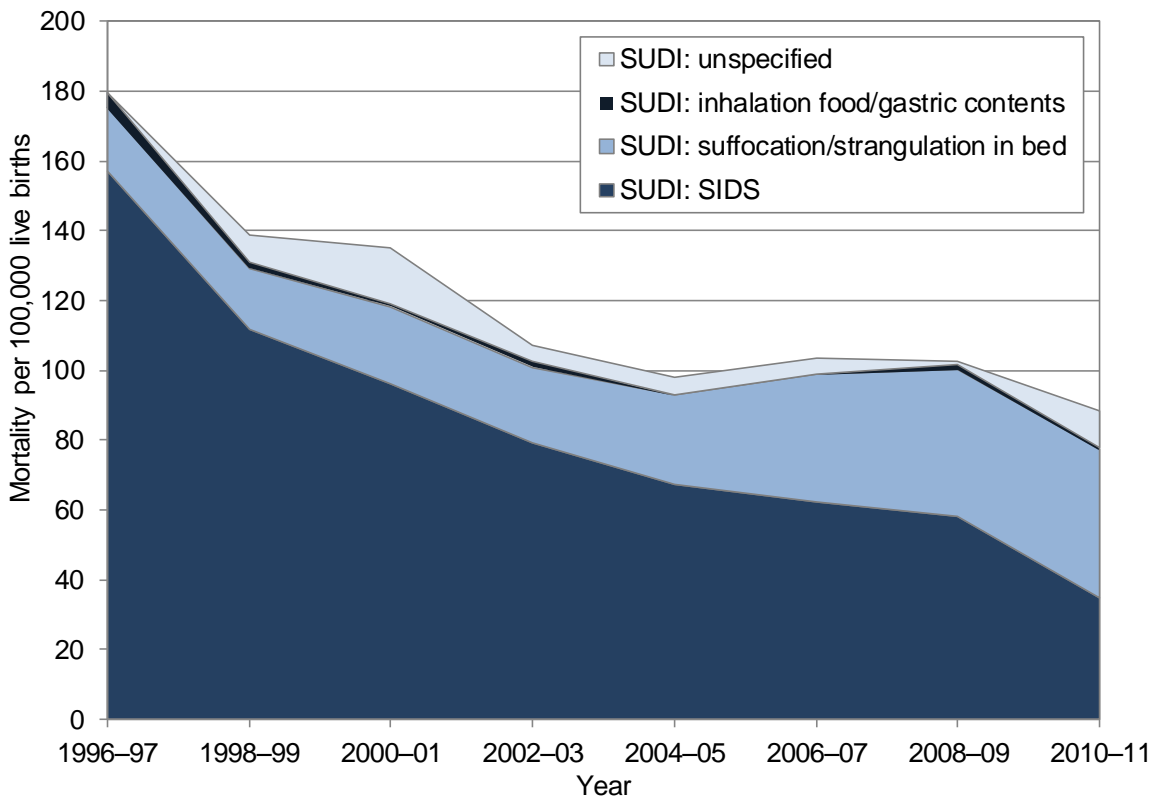
New Zealand Trends

In New Zealand, SUDI rates declined during the late 1990s and early 2000s, but levelled off after 2002–03. When broken down by SUDI sub-type, deaths attributed to SIDS continued to decline throughout 1996–2011, while deaths due to suffocation or strangulation in bed became more prominent as the period progressed. It is unclear, however, whether this represented a diagnostic shift in the coding of SUDI, or whether the sleeping environment made an increasingly greater contribution to SUDI as the period progressed (**Figure 183**).

Distribution by Age

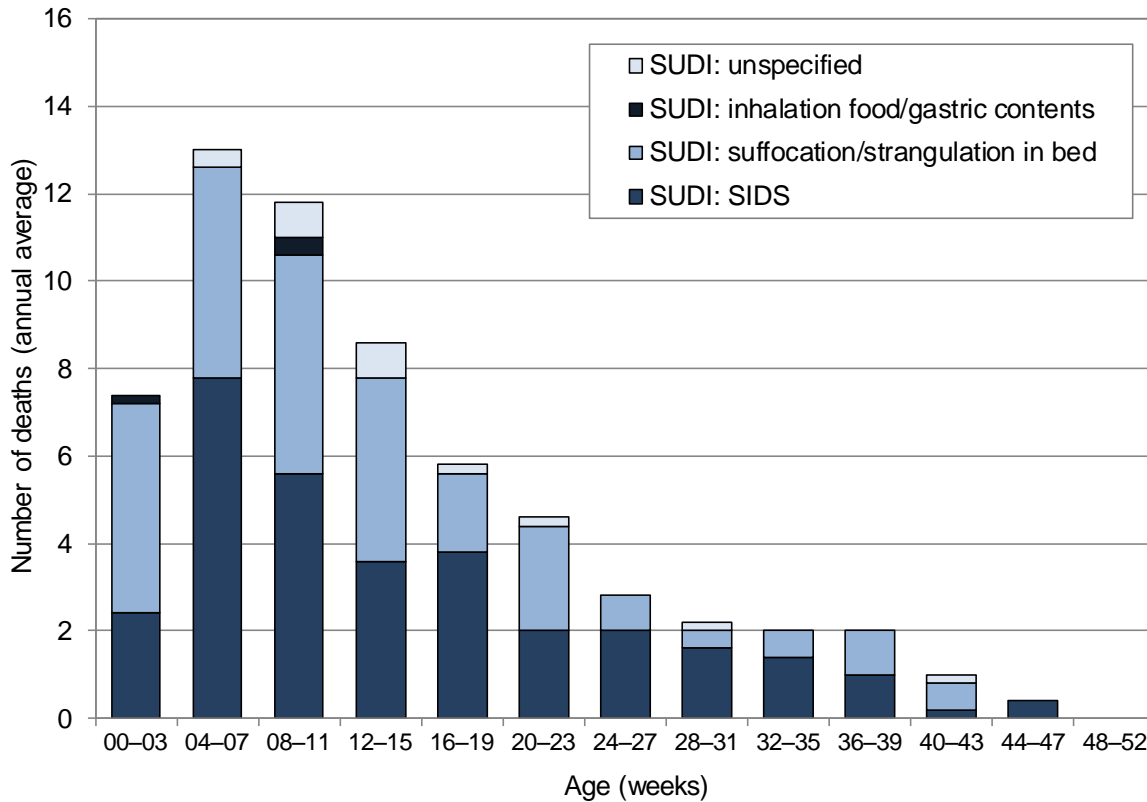
In New Zealand during 2007–2011, SUDI mortality was highest in infants 4–7 weeks, followed by those aged 8–11 weeks, and then those 12–15 weeks of age. Suffocation or strangulation in bed accounted for 64.9% of all SUDI deaths in those aged 0–3 weeks, and 36.9% of SUDI deaths in those aged 4–7 weeks (**Figure 184**).

Figure 183. Sudden Unexpected Death in Infancy by type, New Zealand 1996–2011



Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset

Figure 184. Sudden Unexpected Death in Infancy by type and age in weeks, New Zealand 2007–2011



Source: National Mortality Collection

Distribution by NZDep Index decile, Maternal age, Ethnicity, Gender, and Gestation at birth

In New Zealand during 2007–2011, SUDI rates were *significantly higher* for Māori and for Pacific infants than for European/Other and Asian/Indian infants (**Table 81**). Similar ethnic differences were seen during 1996–2011 (**Figure 185**). SUDI rates were also *significantly higher* during 2007–2011 for those from more deprived areas (NZDep deciles 7–10), for babies that were male, or were preterm, and for the babies of younger (<20 years) mothers (**Table 81**).

Table 81. Distribution of Sudden Unexpected Death in Infancy by NZ Deprivation Index decile, maternal age, ethnicity, gender, and gestation at birth, New Zealand 2007–2011

Variable	Rate	Rate ratio	95% CI	Variable	Rate	Rate ratio	95% CI
Sudden Unexpected Death in Infancy							
NZ Deprivation Index decile				Ethnicity			
Deciles 1–2	33.5	1.00		Māori	211.3	4.70	3.58–6.17
Deciles 3–4	35.1	1.05	0.53–2.05	Pacific	95.1	2.12	1.41–3.19
Deciles 5–6	60.1	1.79	1.00–3.23	Asian/Indian	14.4	0.32	0.13–0.80
Deciles 7–8	104.8	3.13	1.83–5.36	European/Other	44.9	1.00	
Deciles 9–10	184.8	5.52	3.30–9.22	Gender			
Maternal age group				Female	76.4	1.00	
<20 years	295.2	1.00		Male	114.6	1.50	1.19–1.89
20–24 years	183.2	0.62	0.46–0.84	Gestation at birth			
25–29 years	77.4	0.26	0.19–0.37	20–36 weeks	232.6	3.04	2.27–4.08
30–34 years	42.5	0.14	0.10–0.21	37+ weeks	76.5	1.00	
35+ years	36.9	0.12	0.08–0.20				

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Rates are per 100,000 live births; Rate ratios are unadjusted; Ethnicity is Level 1 prioritised; Decile is NZDep06

Figure 185. Sudden Unexpected Death in Infancy by ethnicity, New Zealand 1996–2011



Source: National Mortality Collection; Note: Ethnicity is Level 1 prioritised

Northern DHBs Distribution and Trends

Northern DHBs vs. New Zealand

In Northland during 2007–2011, SUDI rates were *significantly higher* than the New Zealand rate, while in the Waitemata DHB rates were *significantly lower*. Rates in the Auckland and Counties Manukau DHBs were *not significantly* different from the New Zealand rate (**Table 82**).

Table 82. Sudden Unexpected Death in Infancy (SUDI), Northern DHBs vs. New Zealand 2007–2011

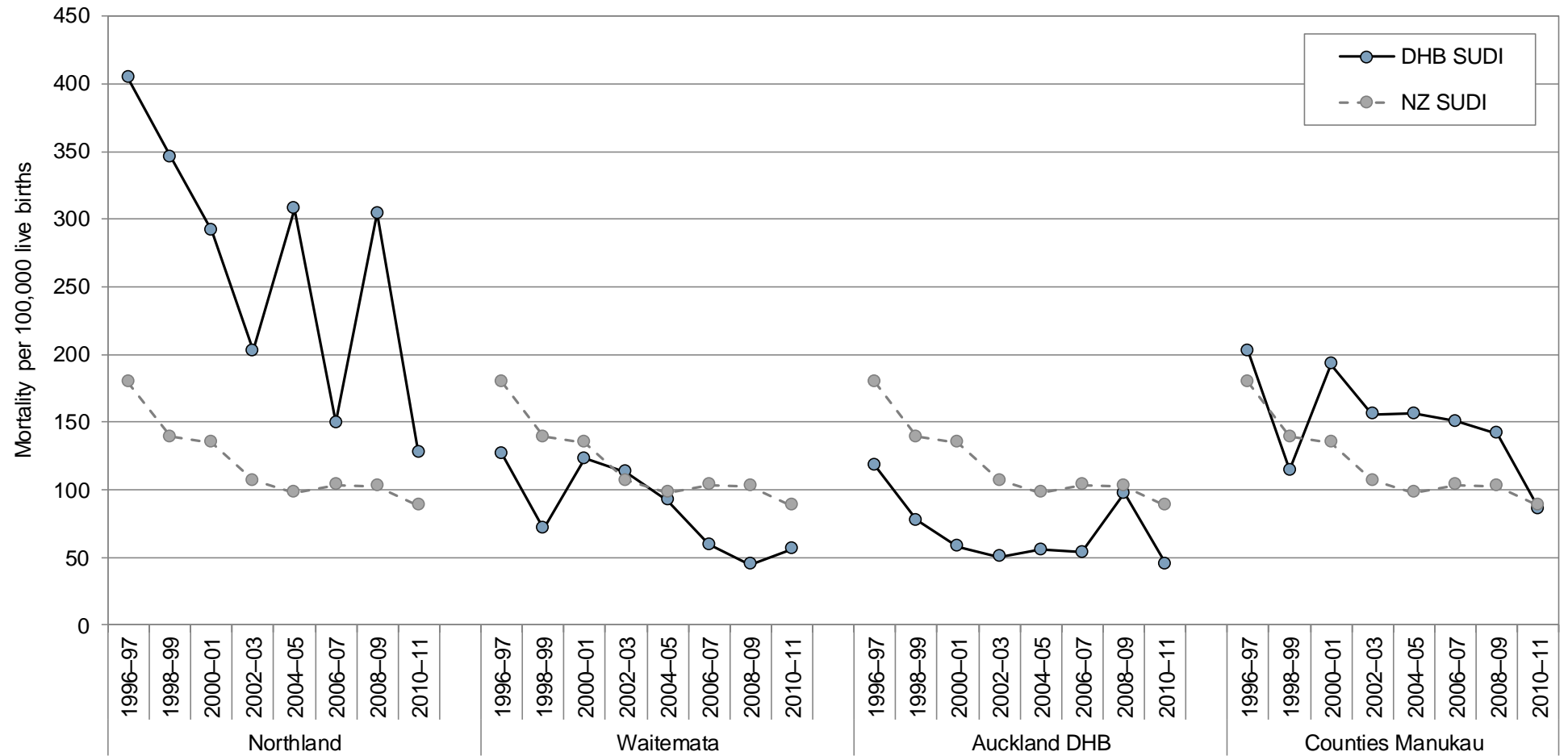
DHB	Number: total 2007–2011	Number: annual average	Rate per 100,000	Rate ratio	95% CI
Sudden unexpected death in infancy					
Northland	23	4.6	196.75	2.05	1.34–3.13
Waitemata	22	4.4	55.77	0.58	0.38–0.89
Auckland	25	5.0	75.12	0.78	0.52–1.18
Counties Manukau	52	10.4	117.89	1.23	0.91–1.65
New Zealand	308	61.6	96.07	1.00	

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Note: Rates are per 100,000 live births

Northern DHB Trends

While SUDI rates in the Northern DHBs exhibited a general downward trend during 2000–2011, rates in Northland and Counties Manukau were generally higher than the New Zealand rate, while rates in the Auckland and Waitemata DHBs were generally lower (**Figure 186**).

Figure 186. Sudden Unexpected Death in Infancy, Northern DHBs vs. New Zealand 1996–2011



Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset

Local Policy Documents and Evidence-Based Reviews Relevant to the Prevention of Sudden Unexpected Death in Infancy (SUDI)

The causes of infant mortality differ markedly with the age of the infant and reflect different causal pathways arising from conception through the first year of life. A review of interventions to address all the causes of infant mortality is beyond the scope of this review. **Table 83** (below) therefore provides a brief overview of local policy documents and evidence-based reviews relevant to the prevention of sudden unexpected death in infancy, a relatively discrete cause of infant mortality, and a cause that is both amenable to prevention and characterised by marked inequalities in New Zealand. Maternal smoking, an important risk factor for SUDI, is addressed in **Table 52** (page 294).

Table 83. Local Policy Documents and Evidence Based Reviews Relevant to the Prevention of Sudden Unexpected Death in Infancy (SUDI)

Ministry of Health publications
<p>Ministry of Health. 2013. Keep your baby safe during sleep. Wellington: Ministry of Health. https://www.health.govt.nz/system/files/resource-files/HE1228-Safe%20Sleep%20WEB.pdf</p> <p>This brief pamphlet intended for parents and caregivers describes the best ways of protecting babies from dying suddenly in their sleep. The advice it contains is aligned with that in the 2013 Child and Youth Mortality Review Committee publication, Special Report: Unintentional suffocation, foreign body inhalation and strangulation (see below)</p>
<p>Ministry of Health and the Child and Youth Mortality Review Committee. 2010. Preventing Sudden Unexpected Death in Infancy (SUDI): Information for parents and caregivers. https://www.health.govt.nz/system/files/resource-files/HE1919.pdf</p> <p>This website provides recommendations to parent and carers on reducing the risk of SUDI. Recommendations include: no smoking during pregnancy; putting babies to sleep on their backs; creating a safe sleeping environment; and breastfeeding. The recommended sleeping environment is having the baby sleeping in a cot or bassinet near the parents' bed. It advises that co-sleeping (a parent who sleeps with their baby in bed) is dangerous when: the baby's mother smoked during pregnancy; the adult in bed with the baby has been drinking, or taking drugs or medicines that might reduce their awareness; and the co-sleeping adult is excessively tired.</p>
New Zealand guidelines
<p>Ministry of Health. 2012. Observation of mother and baby in the immediate postnatal period: consensus statements guiding practice. Wellington: Ministry of Health. http://www.health.govt.nz/system/files/documents/publications/observation-mother-baby-immediate-postnatal-period-consensus-statements.pdf</p> <p>This consensus statement was developed by the New Zealand College of Midwives and the Royal Australian and New Zealand College of Obstetricians and Gynaecologists with support from the Ministry of Health. It states that this guidance will be included in every DHB's Maternity Quality and Safety Programme and it is expected that all practitioners supporting mothers and babies in the immediate post natal period will use it to guide their practice. The rationale for this document is the prevention of Sudden Unexpected Neonatal Deaths (SUND), the risk factors for which are unsupervised skin-to-skin contact, inexperienced mothers, and mothers being left unsupervised in the immediate post-natal period. The statement covers the responsibilities of practitioners and district health boards or employers and the involvement of the family and whānau.</p>
Evidence-based medicine reviews
<p>Strehle EM, Gray WK, Gopiseti S, et al. 2012. Can home monitoring reduce mortality in infants at increased risk of sudden infant death syndrome? A systematic review. <i>Acta Paediatrica</i>, 101(1), 8–13</p> <p>Early research on SIDS suggested that central apnoea attacks and apparent life-threatening events (ALTEs) were precursors of SIDS so home apnoea monitors were sometimes provided to infants considered at high risk, such as ex-premature babies. Later epidemiological studies disproved a direct link between ALTEs and SIDS but identified other risk factors including maternal smoking and prone sleeping position. This systematic review aimed to collate the best available evidence (up to June 30, 2010) on the effectiveness of home monitoring for preventing SIDS. The review authors identified only one RCT plus 12 cohort studies. Across all studies, 2,210 infant were monitored for a total of 12,160 months giving a mean monitoring time of 5.5 months. The RCTs was a small pilot study involving a total of 100 infants born to parents who had lost a previous child to SIDS. Participants were randomised to receive either weighing scales or an apnoea monitor. The authors of this study did not advocate widespread use of home monitoring. The review authors considered that this study had a number of methodological flaws. The 12 cohort studies included two that were published separately but included overlapping data so there were 10 unique studies. These used a variety of types of monitors. Two studies suggested that home monitoring may reduce SIDS in at-risk infants. The review authors found it difficult to draw conclusions from the various studies due to differing inclusion criteria, definitions of at risk infants and monitoring devices and the subjective nature of parental reports of ALTEs. They concluded that there was no high level evidence that home monitoring is effective for preventing SIDS. They noted that it may now be considered unethical to conduct a methodologically rigorous controlled trial to provide more definitive evidence.</p>

Hauck FR, et al. 2011. **Breastfeeding and Reduced Risk of Sudden Infant Death Syndrome: A Meta-analysis.** Pediatrics, 128(1), 103–10. <http://pediatrics.aappublications.org/content/early/2011/06/08/peds.2010-3000>

This meta-analysis measured the association between breastfeeding and sudden infant death syndrome (SIDS), with the aim of identifying whether breastfeeding specifically lowers the risk of SIDS. Eighteen original case-control studies from Europe, North America and Australasia, were included. For infants who received any amount of breast milk for any duration, the univariable summary odds ratio (SOR) was 0.40 (95% CI 0.35 to 0.44), and the multivariable SOR was 0.55 (95% CI 0.44–0.69), suggesting that breastfeeding itself is protective and not merely a marker of other potentially protective factors. For any breastfeeding at two months of age or older, the univariable SOR was 0.38 (95% CI: 0.27–0.54). The effect was strongest for exclusive breastfeeding of any duration (univariable SOR 0.27, 95% CI 0.24–0.31). While the findings are based on observational studies, the consistency of the results led the authors conclude that mothers should be recommended to breastfeed their infants as a potential way to reduce the risk of SIDS.

Task Force On Sudden Infant Death Syndrome. 2011. **Policy Statement. SIDS and Other Sleep-Related Infant Deaths: Expansion of Recommendations for a Safe Infant Sleeping Environment.** Pediatrics, 128 (5), 1030–39. <http://pediatrics.aappublications.org/content/128/5/1030>

Task Force on Sudden Infant Death Syndrome. 2011. **Technical Report. SIDS and Other Sleep-Related Infant Deaths: Expansion of Recommendations for a Safe Infant Sleeping Environment.** Pediatrics, 128(5), e1341–e67. <http://pediatrics.aappublications.org/content/128/5/e1341.full>

This policy statement and background technical report from the American Academy of Pediatrics (AAP) provides an updated set of evidence-based recommendations on SIDS prevention and safe sleep environments that can reduce the risk of all sleep-related infant deaths including suffocation, asphyxia and entrapment. Recommendations include placing the baby in a supine position to sleep, using a firm sleeping surface, breastfeeding, room-sharing without bed-sharing, routine immunisations, considering the use of a pacifier, and avoiding soft bedding, overheating and exposure to tobacco smoke, alcohol and illicit drugs. The technical report provides the rationale for the recommendations.

Vennemann M, et al. 2007. **Do immunisations reduce the risk for SIDS? A meta-analysis.** Vaccine, 25(26), 4875–79.

This meta-analysis, aimed at examining the relationship between immunisation and SIDS, identified nine case-control studies, four of which were adjusted for potential confounders. The summary OR was 0.58 (95% CI 0.46–0.73) in the univariate analysis, suggesting that immunisations were protective, but the presence of heterogeneity made it difficult to combine these studies. The summary OR for the four studies that reported multivariate ORs was 0.54 (95% CI 0.39–0.76) with no evidence of heterogeneity. The authors conclude that immunisations are associated reduced risk of SIDS. A number of explanations are offered, including infection as a risk factor for SIDS, and the healthy vaccinee effect (vaccination may be avoided during illness), making the reduction in SIDS with immunisations a marker of the wellbeing of the infant, and not causally linked. It is recommended that immunisations be part of SIDS prevention campaigns.

Mitchell EA, et al. 2006. **Should Pacifiers Be Recommended to Prevent Sudden Infant Death Syndrome?** Pediatrics, 117(5), 1755–58.

This report aimed to: review the evidence for a reduction in the risk of SIDS with pacifier use, discuss possible mechanisms for the reduction in SIDS risk, and assess other possible effects of pacifiers on infants and children. It is reported that in New Zealand pacifier use is low overall (approximately 10%) but there is wide variation within the country from 3% in the far south to 30% in the northern North Island. The pooled the results of 7 case-control studies and one prospective study revealed a pooled OR of 0.83 (95% CI 0.75 to 0.93) for routine pacifier use. Eight case-control studies also examined pacifier use for the last sleep, with a pooled OR of 0.48 (95% CI 0.43 to 0.54), supporting consistent evidence of a reduction in SIDS with pacifier use. Possible mechanisms for this effect are discussed. Potential negative effects were reviewed, including: a possible reduction in the duration of breastfeeding (3 RCTs, conflicting results): and an increased risk of infection, particularly otitis media, although this may result from reverse causality. The authors conclude that the evidence supports an association between pacifier use and a reduced risk of SIDS and their use should therefore not be discouraged, although they do not support active recommendation. It is suggested that discussion of pacifier use should include advice to offer a pacifier only when breastfeeding is established, after the neonatal period and that they should only be used for sleeping periods in the first year of life.

Hauck FR, et al. 2005. **Do Pacifiers Reduce the Risk of Sudden Infant Death Syndrome? A Meta-analysis.** Pediatrics, 116(5), e716–e23.

This meta-analysis measured the association between pacifier use and sudden infant death syndrome (SIDS), with the aim of identifying whether pacifier use lowers the risk of SIDS. Seven case-control studies were included. The calculated summary odds ratios (SORs) identified a reduction in SIDS risk associated with pacifier use, suggesting that pacifier use is protective for SIDS. For usual pacifier use the univariate SOR was 0.90 (95% CI 0.59–0.85) and the multivariate SOR was 0.71 (95% CI 0.59–0.85). For pacifier use during the last sleep the univariate SOR was 0.47 (95% CI 0.40–0.55) and multivariate SOR was 0.39 (95% CI 0.31–0.50). The authors recommend pacifier use for infants up to 1 year of age (introduced after breastfeeding has been well established in breastfed infants). Concerns about possible adverse effects, including on breastfeeding, and otitis media, led to a further review in 2006 (see above).

Other relevant publications

Glengarry JM, Crawford J, Morrow PL, et al. 2014. **Long QT molecular autopsy in sudden infant death syndrome.** Archives of Disease in Childhood, 99(7).

Long QT syndrome (LQTS) is a group of inherited cardiac ion channelopathies, with 13 known genotypes, which predispose to sudden death due to ventricular tachycardia (an abnormally fast heart rate with irregular beats). It is believed that LQTS may be a cause of sudden infant death. This study, done in Auckland, reports on experience with long QT molecular autopsy in 102 cases of sudden infant death syndrome (SIDS). The study had two parts. One was a two-year prospective population-based series of 71 SIDS cases (1 September 2006 to 21 August 2008) where all referrals for testing were accepted and testing was done at no cost (the 'unselected' group). The second part involved investigation of 31 selected SIDS cases from before and after the prospective study period. The cardiac genetic team reviewed the police report and final autopsy report of some SIDS case on an ad-hoc basis and tested only those where it was felt there was an increased likelihood of arrhythmic death (the 'selected'). Of the total 102 cases, 49 (47%) were Māori and 24 (23%) were Pacific Island. Risk factors for SIDS were common and bed sharing was reported in 49%. In the 'unselected' group three infants (4%) had rare genetic variants, and in the 'selected' group, five (16%). Only two of the variants, both in infants in the selected group, were regarded as being of definite or probable pathogenicity with the others being of possible or doubtful pathogenicity. The study authors found engaging families challenging. Only three out of the eight variant positive (38%) and 19 of the 94 variant-negative (19%) families participated in cardiac or genetic screening. The study authors concluded that LQT molecular autopsy has a very low yield in unselected SIDS cases where risk factors are common but that diagnostic yield can be higher with case selection. They stated that it is essential to engage the family prior to testing to counsel them about the possible uncertainty of the results and to permit family phenotype/genotype cosegregation studies.

Child and Youth Mortality Review Committee, Te Rōpū Arotake Auau Mate o te Hunga Tamariki Taiohi. 2013. **Special Report: Unintentional suffocation, foreign body inhalation and strangulation.** Wellington: Child and Youth Mortality Review Committee. <http://www.hqsc.govt.nz/assets/CYMRC/Publications/CMYRC-special-report-March-2013.pdf>

It is increasingly recognised that unintentional suffocation is a significant contributing factor to SUDI and that a considerable proportion of deaths that might once have been considered as SUDI are attributable to traumatic asphyxia occurring in an unsafe sleeping situation such as becoming wedged between bedding and a firm surface or being overlain by someone sharing the bed. This report provides information from the New Zealand Mortality Review Database concerning the children and young people aged less than 25 years who died due to suffocation, foreign body inhalation and strangulation between 1 January 2002 and 31 December 2009. Fifty of the 79 deaths in the report were due to unintentional suffocation in bed and most of these were infants. The report includes a discussion of issues identified and recommendations to prevent future deaths.

Abel S, Tipene-Leach D. 2013. **SUDI prevention: A review of Māori safe sleep innovations for infants.** New Zealand Medical Journal, 126(1379). <http://journal.nzma.org.nz/journal/126-1379/5764/>

This article reviews some of the Māori-initiated innovations for providing safe sleep environments for babies. The authors note that neither health promotion nor coroners urging parents not to bed share with their babies have had much impact among Māori and suggest that bed sharing amongst Māori is both a culturally-valued behaviour and common practice in resource-poor homes. The Wahakura is a bassinette-type basket woven from flax. It has a thin foam mattress and is designed to be placed in the parental bed to provide a safe sleeping space for the baby and to appeal to Māori mothers who might otherwise reject advice not to bed share in an unsafe fashion. Wahakura have proved very popular but require considerable skill and time to make so it does not appear economically feasible to provide them to all who could benefit. An alternative is the pēpi-pod, a plastic container with a decorative cover and a mattress, sheet and blanket. In early 2013, the pēpi-pod was being actively deployed in five regions: Otara, Waikato, Rotorua, Hawke's Bay and Christchurch. Evaluations in Christchurch and Hawke's Bay have found that pēpi-pods are highly acceptable to families. A RCT comparing outcomes from an enhanced safe sleep education programme that uses pēpi-pods with those from a standard safe sleep education programme is currently underway (the *Haumarū moe o te pēpi* study, funded by Cure Kids and the Auckland Medical Research Foundation).

Ball HL, Volpe LE. 2013. **Sudden Infant Death Syndrome (SIDS) risk reduction and infant sleep location—Moving the discussion forward.** Social Science & Medicine, 79(0), 84–91.

This article argues that, in the US, failure to recognise the role of bed sharing in ethnic and sub-cultural identity has led to inappropriate and ineffective interventions that are ignored by the target population. The authors note that outside Western post-industrial settings, mother-infant contact during sleep remains the norm and that there is a well-documented association between bed sharing and breastfeeding although it is unclear if the association is causal (in either direction). They state that research needs to address those combinations of circumstances that make certain behaviours risky for infants in ways that are supportive and concordant with the local infant care landscape.

Cowan S, Pease A, Bennett S. 2013. **Usage and impact of an online education tool for preventing sudden unexpected death in infancy.** Journal of Paediatrics & Child Health, 49(3), 228–32

This paper reports on the usage and impact of an online tool, a 24 slide presentation with voiceover, aimed at mainstream health professionals in New Zealand. The online tool, 'Baby Essentials Online', was intended to extend the reach of face-to-face sessions and enable rural and after-hours participation. It was promoted through a network of 'safe sleep' champions. Between 18 November and 31 December 2011 there were 3286 completed sessions, and 2683 (81.7%) had complete data. Usage reached people across regions, roles and ethnic groups. On completing the course, most people (68.8%) gave a high rating to their 'increased confidence to be a safe sleep advocate for babies'. Having a high increased confidence rating was significantly associated with spending more time per slide and with being of Māori, Pacific or Other ethnicity compared to European. The study authors concluded that this simple online tool achieved its aims of high usage and wide participation was a cost effective means of increasing confidence to discuss safe infant sleeping with others. They stated that "e-Learning modes should be considered where there is a need to align large numbers of people in a short time with understandings and actions for addressing a specific health issue". The updated 'Baby Essentials Online', and summary versions in 20 non-English languages, can be accessed here: http://www.changefourchildren.co.nz/safe_start_programme/baby_essentials_online

Mitchell E A, Blair P S. 2012. **SIDS prevention: 3000 lives saved but we can do better.** NZMJ, 125(1359), 50–7. <http://journal.nzma.org.nz/journal/125-1359/5277/>

This article provides a good overview of the situation in New Zealand regarding sudden infant death. It highlights the success of efforts to encourage supine (on the back) sleeping and argues that more lives could be saved if more focus was placed on discouraging parents from bed sharing with their babies, particularly in hazardous situations such as on a couch or sofa or when the parent has been smoking, drinking or taking other drugs.

Hutchison BL, Rea C, Stewart AW, et al. 2011. **Sudden unexpected infant death in Auckland: a retrospective case review.** Acta Paediatrica, 100(8), 1108–12. <http://www.whakawhetu.co.nz/sites/default/files/Sudden%20unexpected%20infant%20death%20in%20Auckland%20a%20retrospective%20case%20review.pdf>

This paper reports on a review of all autopsy reports of SUDI deaths in the Auckland region from October 2000 to December 2009. Of the 332 post-mortems done in the region during the period, two-thirds (221) were classified as SUDI. Of these 83% were Māori or Pacific infants. The median age at death was 11 weeks. Overall, 60% were bed sharing at the time of death. Of the 11% of deaths which occurred in babies aged 7–28 days, 92% occurred while bed sharing. The position the infant was placed for sleep was known in only 58% (129) of cases. Of these 57% were placed in a non-recommended position (non-supine) position. The study authors stated that there is a need to improve SUDI prevention messages, particularly for Māori and Pacific families.

Tipene-Leach D, Hutchison L, Tangiora A, et al. 2010. **SIDS-related knowledge and infant care practices among Māori mothers.** New Zealand Medical Journal, 123(1326), 88–96. <http://journal.nzma.org.nz/journal/123-1326/4445>

This paper reports on a survey of Māori mothers who gave birth in the Counties Manukau DHB Area from 21 July to 31 December 2008. The survey aimed to determine the mothers' knowledge about SIDS prevention and SIDS-related child care practices. Forty-one per cent of those eligible participated (299 out of 734, mostly due to difficulty contacting mothers rather than mothers declining to participate). Survey results were compared with a similar 2005 survey of mostly European mothers who gave birth at National Women's Hospital (NWH). It was found that the Māori mothers had much lower knowledge about SIDS prevention practices and were likely to have gained the knowledge they did have from a midwife, Plunket or the hospital rather than from an antenatal class. More Māori babies slept on their front and Māori mothers stopped breastfeeding significantly earlier. Although similar proportions of Māori and NWH mothers reported that their baby "usually" and "last night" slept in their own bed, 65% of the mothers in this survey reported some bed sharing (vs 27% of the NWH mothers), and of these, 39% shared for more than two hours. More than half the Māori mothers had smoked in pregnancy and a third used potentially unsafe objects such as pillows or rolled blankets to maintain their baby's sleep position. The study authors stated that their findings highlight the need for appropriate health promotion message to be developed for the Māori community.

Child and Youth Mortality Review Committee, Te Rōpū Arotake Auau Mate o te Hunga Tamariki, Taiohi. 2009. **Chapter 1: Sudden Unexpected Death in Infancy (SUDI) in Fifth Report to the Minister of Health: Reporting mortality 2002–2008.** Wellington: Child and Youth Mortality Review Committee. <http://www.hqsc.govt.nz/assets/CYMRC/Publications/cymrc-5th-report-chp1-sudi.pdf>

This report includes an analysis of SUDI mortality data from 2003–2007, including an assessment of risk factors for SUDI, recommendations from local mortality review groups, and observations and recommendations from the Child and Youth Mortality Review Committee on how to reduce incidents of SUDI in New Zealand.

Websites

Change for our children <http://www.changefourchildren.co.nz/>

Change for our Children is a 'social innovation company' that aims to build a culture of respect for children. Their website includes a variety of resources related to SUDI prevention, including reports on the pēpi-pod projects which provide cheap plastic baby beds to create a safe sleeping spaces for babies, and resources relating to the Safe Start Programme which aims to ensure all New Zealanders, know, accept and act on the facts concerning safe sleep for babies: http://www.changefourchildren.co.nz/safe_start_programme/index .

SUDI <http://www.hqsc.govt.nz/our-programmes/mrc/cymrc/publications-and-resources/sudi/>

This website provides links to SUDI prevention publications and resources developed by the Child and Youth Mortality Review Committee (CMYRC), a statutory committee accountable to the Health Quality and Safety Commission. Resources include safe sleeping guidelines, links to CMYRC mortality reports, and examples of DHB safe sleeping policies.

Whakawhetu <http://www.whakawhetu.co.nz/>

Whakawhetu National SUDI Prevention for Māori (previously known as Māori SIDS) is a national kaupapa Māori organisation dedicated to reducing the rate of SUDI for Māori. The organisation provides policy advice, disseminates evidence-based information, and delivers training, education and workforce development with the aim of strengthening SUDI prevention services that engage with whānau. The website includes safe sleeping advice, news, resources and information. It provides information on the wahakura, a woven flax baby bed designed to protect baby by providing a safe sleeping space in an adult bed, and the pēpi-pod, a plastic baby bed which is a cheaper alternative to a wahakura.

TAHA <http://www.taha.org.nz/>

TAHA Well Pacific Mother and Infant Service works collaboratively in the health sector on key areas of health and wellbeing for Pacific mothers and infants with the purpose of reducing a range of maternal and infant morbidity and mortality. The website provides links to a variety of resources, including SUDI prevention resources.

Note: these publications listed were identified using the search methodology outlined in **Appendix 1**

SAFETY AND FAMILY VIOLENCE



INJURIES ARISING FROM THE ASSAULT, NEGLECT OR MALTREATMENT OF CHILDREN

Introduction

Child maltreatment has been defined as any act of commission or omission by a parent or other caregiver that results in harm, potential for harm, or threat of harm to a child. Child abuse (acts of commission) includes physical, sexual and emotional abuse, and fabricated or induced illness. Child neglect (acts of omission) includes failure to: provide for a child's physical and emotional needs; obtain necessary medical or dental care; ensure a child has access to education; provide adequate supervision, and prevent exposure to violent environments [383]. Child abuse and neglect have both short term and lifelong physical, psychological, and behavioural consequences for individuals and consequences for society. Survivors of childhood sexual abuse are at risk for a wide range of medical, psychological, behavioural, and sexual disorders [384]. Studies on child abuse or neglect and subsequent mental and physical health outcomes suggest a causal relationship between non-sexual child maltreatment and a range of mental disorders, suicide attempts, drug use, and risky sexual behaviour [385].

Most child maltreatment is perpetrated by parents or guardians, many of whom were themselves maltreated as children [385,386]. Poverty, sole parenthood, the presence of a non-biological parent in the household, mental health problems, domestic violence, and alcohol and drug abuse increase the probability of abusive parenting [385,386]. Characteristics that make a child more difficult to care for than usual, for example crying a lot, having a "difficult temperament", or being disabled, may increase a child's risk of being maltreated, especially where there are other demographic or family risk factors [387].

A UNICEF report on child maltreatment deaths from 1994 to 1998 ranked New Zealand near the bottom in the OECD [388] with a rate of 1.2 deaths per 100,000 children under 15 years, double the OECD median. Over the period 2002–2012 New Zealand's rates of child death due to assault have not improved [380].

The following section reviews hospital admissions and mortality from injuries arising from the assault, neglect, or maltreatment of children aged 0–14 years using information from the National Minimum Dataset and the National Mortality Collection.

Data Source and Methods

Indicator

1. Hospital admissions for injuries arising from the assault, neglect, or maltreatment of children 0–14 years
2. Deaths from injuries arising from the assault, neglect, or maltreatment of children 0–14 years

Data Source

1. Hospital admissions

Numerator: National Minimum Dataset: Hospital admissions for children (0–14 years) with a primary diagnosis of injury (ICD-10-AM S00–T79) and an external cause code of intentional injury (ICD-10-AM X85–Y09) in any of the first 10 external cause codes. As outlined in **Appendix 3:** The National Minimum Dataset in order to ensure comparability over time, all cases with an emergency department specialty code (M05–M08) on discharge were excluded, as were admissions with a primary diagnosis outside of the ICD-10-AM S00–T79 injury range.

Denominator: NZ Statistics NZ Estimated Resident Population

2. Mortality

Numerator: National Mortality Collection: Deaths in children (0–14 years) with a clinical code (cause of death) of intentional injury (ICD-10-AM X85–Y09).

Denominator: NZ Statistics NZ Estimated Resident Population

Notes on Interpretation

The limitations of the National Minimum Dataset are discussed at length in **Appendix 3:** The National Minimum Dataset. The reader is urged to review this Appendix before interpreting any trends based on hospital admission data.

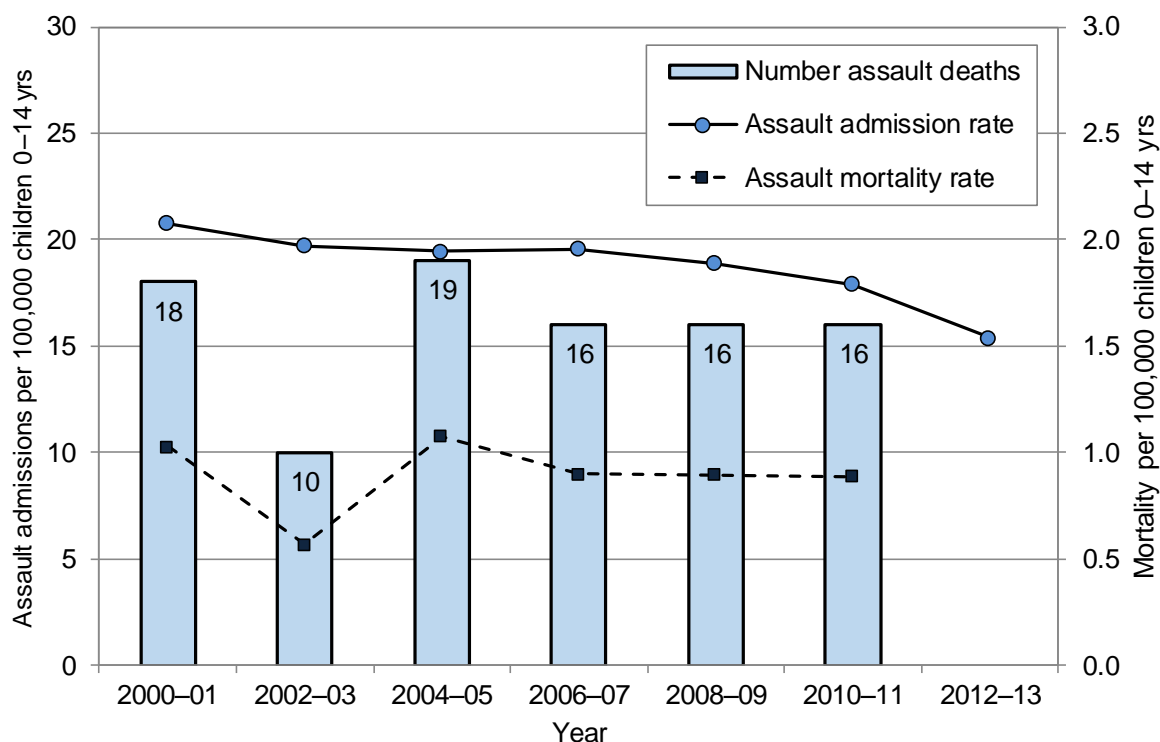


New Zealand Distribution and Trends

New Zealand Trends

In New Zealand during 2000–2013, hospital admissions for injuries arising from the assault, neglect, or maltreatment of children declined gradually, while mortality during 2000–2011 remained relatively static. On average during 2000–2011, approximately 8 children per year died as a result of injuries arising from assault, neglect, or maltreatment (Figure 187).

Figure 187. Hospital admissions (2000–2013) and deaths (2000–2011) due to injuries arising from the assault, neglect, or maltreatment of New Zealand children aged 0–14 years



Source: Numerator: *Admissions*: National Minimum Dataset (emergency department cases excluded); *Mortality*: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population; Note: numbers of deaths are per two year period

Distribution by Age and Gender

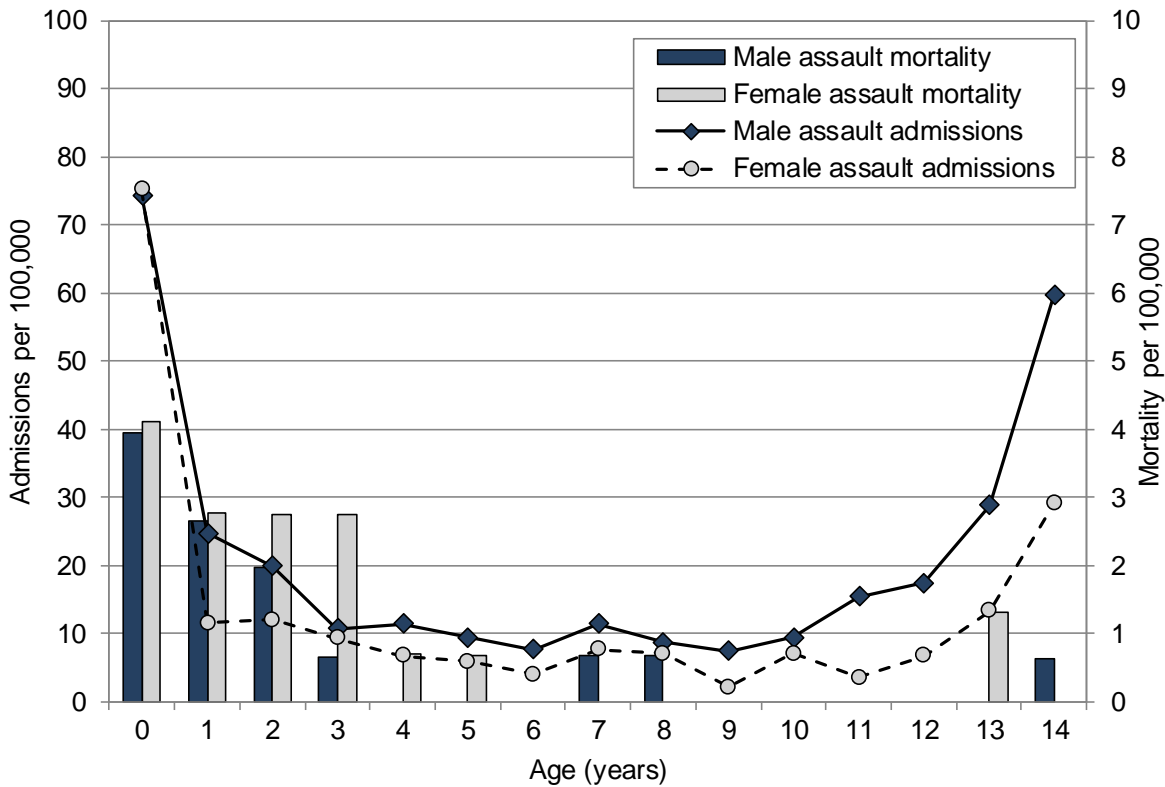
In New Zealand during 2009–2013, hospital admissions for injuries arising from the assault, neglect, or maltreatment of children exhibited a U-shaped distribution with age, such that rates were higher for infants aged less than one year and for those over eleven years of age. In contrast, mortality was highest for infants less than one year, followed by those aged one and two years (Figure 188).

The gender balance for admissions was relatively even during infancy and early childhood, however, admissions for males became more predominant as adolescence approached (Figure 188).

Trends by Ethnicity

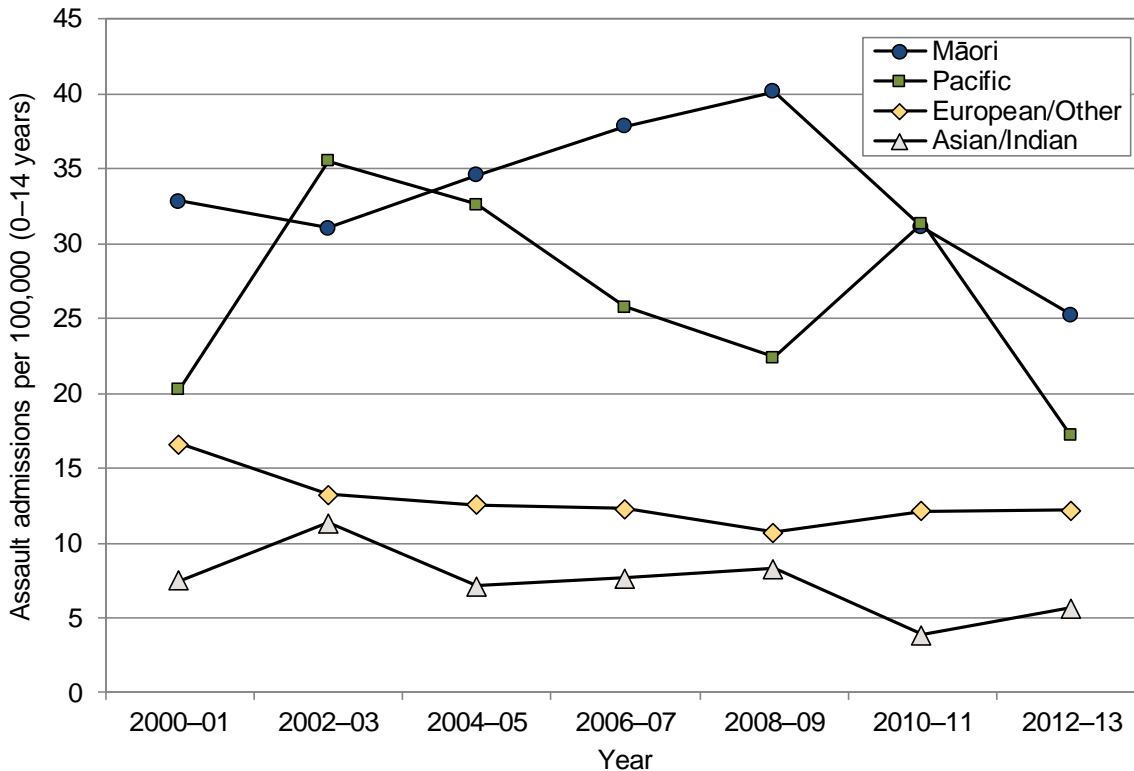
In New Zealand during 2000–2013, hospital admissions for injuries arising from assault, neglect, or maltreatment were consistently higher for Māori and Pacific children than for European/Other and Asian/Indian children. While rates for European/Other children declined during this period, rates for Māori children increased during the early-to-mid 2000s, but declined during 2010–2013. In contrast, admissions for Pacific children also declined during the early-to-mid 2000s, but increased in 2010–2011 before declining again in 2012–2013 (Figure 189).

Figure 188. Hospital admissions (2009–2013) and deaths (2007–2011) due to injuries arising from the assault, neglect, or maltreatment of New Zealand children by age and gender



Source: Numerator: Admissions: National Minimum Dataset (emergency department cases excluded); Mortality: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population

Figure 189. Hospital admissions for injuries arising from the assault, neglect, or maltreatment of children aged 0–14 years by ethnicity, New Zealand 2000–2013



Source: Numerator: National Minimum Dataset (emergency department cases excluded); Denominator: Statistics NZ Estimated Resident Population; Note: Ethnicity is level 1 prioritised



Distribution by NZDep Index Decile, Ethnicity and Gender

In New Zealand during 2009–2013, hospital admissions for injuries arising from the assault, neglect, or maltreatment of children were *significantly higher* for males and for those from average to more deprived areas (NZDep deciles 3–10). Admissions were also *significantly higher* for Māori and Pacific children than for European/Other children, and *significantly lower* for Asian/Indian children (**Table 84**).

Table 84. Hospital admissions for injuries arising from the assault, neglect, or maltreatment of children aged 0–14 years by NZDep Index decile, ethnicity and gender, New Zealand 2009–2013

Assault, neglect, or maltreatment admissions							
Children 0–14 years							
Variable	Rate	Rate ratio	95% CI	Variable	Rate	Rate ratio	95% CI
NZ Deprivation Index decile				Prioritised ethnicity			
Deciles 1–2	4.41	1.00		Māori	31.24	2.60	2.23–3.03
Deciles 3–4	8.97	2.04	1.37–3.02	Pacific	23.39	1.95	1.55–2.44
Deciles 5–6	15.48	3.51	2.45–5.04	Asian/Indian	6.51	0.54	0.37–0.79
Deciles 7–8	21.89	4.97	3.52–7.02	European/Other	12.01	1.00	
Deciles 9–10	31.52	7.16	5.12–10.01				
Gender							
Female	13.45	1.00		Male	21.18	1.57	1.36–1.82

Source: Numerator: National Minimum Dataset (emergency department cases excluded); Denominator: Statistics NZ Estimated Resident Population; Note: Rate is per 100,000; Rate ratios are unadjusted; Ethnicity is level 1 prioritised; Decile is NZDep06

Nature of the Injury Sustained

During 2009–2013, the head was the most common site for injuries sustained as the result of the assault or neglect. For those aged 0–4 years, 59.3% of their injuries were to the head with the largest proportion being traumatic subdural haemorrhages and superficial head injuries. For children aged 5–9 years, 39.3% of their injuries were to the head, and were more commonly superficial. The next most common site was the abdominal/lower back/spine/pelvis area followed by the upper limb. For children aged 10–14 years, 55.5% of injuries were to the head, the most common being fractures of the skull or facial bones. The next most common site of injury for this age group was the upper limb (**Table 85**).



Table 85. Nature of injuries arising from assault, neglect, or maltreatment in hospitalised children 0–14 years by age group, New Zealand 2009–2013

Primary diagnosis	Number: total 2009– 2013	Number: annual average	Rate per 100,000	Percent
Assault, neglect, or maltreatment				
Children aged 0–4 years				
Traumatic subdural haemorrhage	88	17.6	5.78	22.7
Superficial head injury	76	15.2	4.99	19.6
Fracture skull or facial bones	16	3.2	1.05	4.1
Other head injuries	50	10.0	3.28	12.9
Injuries to thorax (including rib fractures)	5	1.0	0.33	1.3
Injuries to abdomen, lower back, and pelvis	26	5.2	1.71	6.7
Injuries to upper limb	30	6.0	1.97	7.8
Fractured femur	16	3.2	1.05	4.1
Other injuries to lower limb	8	1.6	0.53	2.1
Maltreatment	42	8.4	2.76	10.9
Other injuries	30	6.0	1.97	7.8
Total	387	77.4	25.42	100.0
Children aged 5–9 years				
Superficial head injury	20	4.0	1.34	18.7
Fracture skull or facial bones	3	0.6	0.20	2.8
Concussion	3	0.6	0.20	2.8
Other head injuries	16	3.2	1.07	15.0
Injuries to abdomen, lower back, and pelvis	20	4.0	1.34	18.7
Injuries to upper limb	14	2.8	0.94	13.1
Other injuries to lower limb	6	1.2	0.40	5.6
Maltreatment	8	1.6	0.54	7.5
Other injuries	17	3.4	1.14	15.9
Total	107	21.4	7.19	100.0
Children aged 10–14 years				
Fracture skull or facial bones	61	12.2	4.06	20.9
Concussion	37	7.4	2.46	12.7
Superficial head injury	24	4.8	1.60	8.2
Other head injuries	40	8.0	2.66	13.7
Injuries to thorax (including rib fractures)	10	2.0	0.67	3.4
Injuries to abdomen, lower back, and pelvis	22	4.4	1.46	7.5
Injuries to upper limb	48	9.6	3.19	16.4
Fractured femur	3	0.6	0.20	1.0
Other injuries to lower limb	12	2.4	0.80	4.1
Maltreatment	11	2.2	0.73	3.8
Other injuries	24	4.8	1.60	8.2
Total	292	58.4	19.42	100.0

Source: National Minimum Dataset (emergency department cases excluded)



Northern DHBs Distribution and Trends

Northern DHBs vs. New Zealand

In the Waitemata and Auckland DHBs during 2009–2013, hospital admissions for injuries arising from the assault, neglect, or maltreatment of children were *significantly lower* than the New Zealand rate, while in Northland and Counties Manukau rates were *not significantly* different from the New Zealand rate (**Table 86**).

Table 86. Hospital admissions for injuries arising from the assault, neglect, or maltreatment of children aged 0–14 years, Northern DHBs vs. New Zealand 2009–2013

DHB	Number: total 2009– 2013	Number: annual average	Rate per 100,000	Rate ratio	95% CI
Children 0–14 years					
Assault, neglect or maltreatment injuries					
Northland	31	6	17.17	0.99	0.69–1.41
Waitemata	58	12	10.40	0.60	0.46–0.78
Auckland	42	8	10.26	0.59	0.43–0.80
Counties Manukau	116	23	19.63	1.13	0.93–1.37
New Zealand	786	157	17.41	1.00	

Source: Numerator: National Minimum Dataset (emergency department cases excluded); Denominator: Statistics NZ Estimated Resident Population

Northern DHB Trends

In the Waitemata, Auckland and Counties Manukau DHBs, hospital admissions for injuries arising from the assault, neglect or maltreatment of children exhibited a general downward trend during 2000–2013. Rates in Counties Manukau were generally higher than the New Zealand rate, while rates in the Waitemata DHB were consistently lower (**Figure 190**).

Northern DHBs Mortality

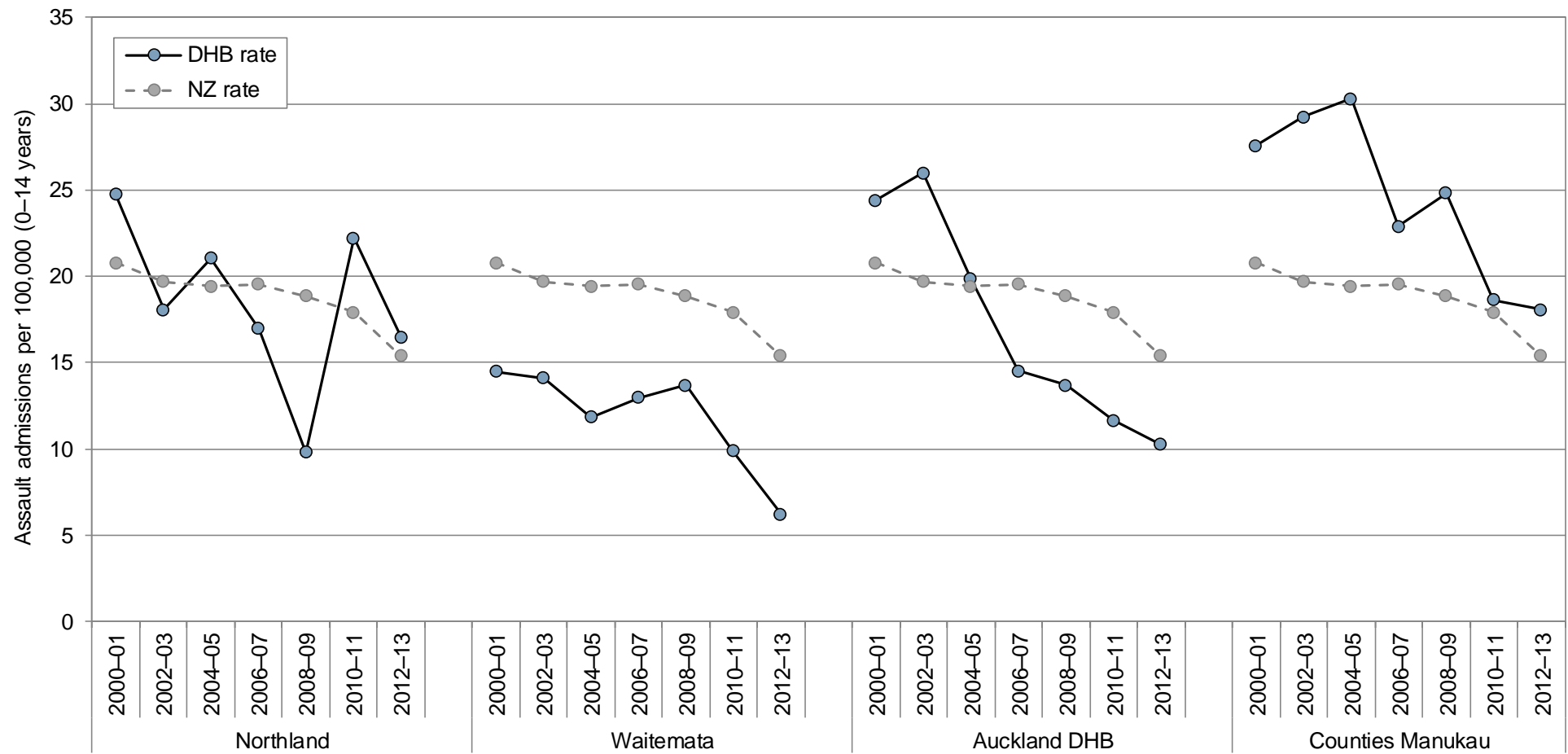
During 2000–2011, 4 Northland, 10 Waitemata, 10 Auckland, and 11 Counties Manukau children died as the result of injuries arising from assault, neglect, or maltreatment.

Local Policy Documents and Evidence-based Reviews Relevant to the Prevention of Child Maltreatment

In New Zealand there are a range of publications that focus on child maltreatment and family violence. A large number of international reviews have also explored these issues. **Table 87** (below) summarises publications that focus primarily on child maltreatment, while **Table 104** on page 430 reviews those publications that consider family violence more broadly.



Figure 190. Hospital admissions for injuries arising from the assault, neglect, or maltreatment of children aged 0–14 years, Northern DHBs vs. New Zealand 2000–2013



Source: Numerator: National Minimum Dataset (emergency department cases excluded); Denominator: Statistics NZ Estimated Resident Population

Table 87. Local policy documents and evidence-based reviews relevant to the prevention of child maltreatment

Ministry of Health publications
<p>Ministry of Health. 2002. Family violence intervention guidelines child and partner abuse. Wellington: Ministry of Health. http://www.health.govt.nz/publication/family-violence-intervention-guidelines-child-and-partner-abuse</p> <p>These guidelines are aimed at all health care professionals and provide a framework for safe and effective interventions to assist victims of violence and abuse. The report identifies health care providers as being in an ideal position to assist in the early identification of family violence because they come into contact with the majority of children. Guidance on identification, assessment and response to suspected child abuse is provided.</p>
<p>Ministry of Health. 2001. Suspected child abuse and neglect: Recommended referral process for General Practitioners. Wellington: Ministry of Health. http://www.health.govt.nz/publication/recommended-referral-process-general-practitioners-suspected-child-abuse-and-neglect</p> <p>This document, developed by the Ministry of Health, and Child Youth and Family, with significant input from the Royal New Zealand College of General Practitioners, provides a set of guiding principles and key points for general practitioners in assessing suspected child abuse. A table and flowchart summarising the process for recognising child abuse and neglect are provided. A set of appendices include body diagram sheets, a referral facsimile, Child, Youth and Family referral procedures, recommended procedures for general practices and relevant legal issues.</p>
Ministry of Education publications
<p>Ministry of Education. 2009. Reporting of suspected or actual child abuse and neglect: Protocol between the Ministry of Education, the New Zealand Schools Trustees Association and Child, Youth and Family 2009. Wellington: Ministry of Education. http://www.minedu.govt.nz/~media/MinEdu/Files/EducationSectors/SpecialEducation/PublicationsResources/ReportingAbuseProtocolAug09.pdf</p> <p>This protocol is intended to assist boards of trustees, principals and school staff in dealing with child abuse and neglect, and the management of child abuse allegations against board employees.</p>
Ministry of Social Development publications
<p>Child, Youth and Family. 2011. Working together to keep children and young people safe. Wellington: Ministry of Social Development. http://www.cyf.govt.nz/documents/about-us/publications/27713-working-together-3-0-45ppi.pdf</p> <p>This guide is for people in social service agencies, schools, healthcare organisations, community and other groups who have close contact with children and families. It covers looking out for vulnerable families, recognising child abuse, what to do if you have concerns about a child, offering help to families, and the role of Child Youth and Family.</p>
<p>Ministry of Social Development. 2010. Recognising and responding to child neglect in New Zealand. Wellington: Ministry of Social Development. http://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/research/recognising-child-neglect/child-neglect-report-final.pdf</p> <p>This report presents the findings from two research projects commissioned to inform policy on child maltreatment. The research addressed the neglect of children from birth to five years and it involved a literature review and key informant interviews with 22 workers from the health, social services and education sectors. Part A of the report summarises the findings from the interviews and part B summarises the literature review findings. The findings cover: definitions of child neglect; factors associated with child neglect; prevalence and incidence of child neglect; recognising child neglect and its impacts; prevention and intervention responses; difficulties when responding to neglect; what is working well, and how we could better prevent and respond to child neglect in New Zealand.</p>

Centre for Social research and Evaluation. 2008. **Preventing physical and psychological maltreatment of children in families.** Wellington: Ministry of Social Development. <http://www.msd.govt.nz/about-msd-and-our-work/publications-resources/literature-reviews/preventing-maltreatment/index.html>

This report presents a summary of the findings of a literature review of New Zealand and international research about the physical and psychological abuse of children and the prevention of child maltreatment. The review was undertaken to provide an evidence base for the development of the Campaign for Action on Family Violence, and public and community education programmes. It aimed to determine: the nature and consequences of child maltreatment; the predisposing, precipitating and perpetuating factors; the factors that contribute to primary prevention, and to effective and safe parenting; and what motivates adults (both family and non-family) to intervene when they suspect a child is being abused. The findings from the review indicated that child maltreatment has harmful and long-lasting consequences, and is more prevalent in deprived families and communities. Predisposing factors for becoming an abusive parent include genetic characteristics and having grown up in a violent or abusive environment. Perpetuating factors included the wider social context, the family context, and the characteristics and behavioural patterns of the parent or caregiver and the child. Precipitating factors are those that directly trigger an abusive episode, for example incessant crying, soiling, aggressive behaviour, or a crisis event for a parent. Parent education programmes may be more effective if they: are provided separately to men and women by workers of the same ethnicity as the parents, are based on a combination of changing attitudes and increasing knowledge and child management skills, and are optimistic and non-judgemental. Increasing awareness of the extended family and the public is likely to be more effective than interventions aimed at the parents for dealing with severe baby and child battering. To increase the chances of witnesses and bystanders intervening it is necessary to promote awareness and understanding of the issue, provide access to help, support and advice, give practical tips, and provide information on all the options.

Other government publications

Bennett P. 2012. **The White Paper for Vulnerable Children. Volume I.** Wellington: New Zealand Government.

Bennett P. 2012. **The White Paper for Vulnerable Children. Volume II.** Wellington: New Zealand Government. <http://www.childrensactionplan.govt.nz/action-plan/white-paper/>

New Zealand Government. 2012. **Children's Action Plan: Identifying, supporting and protecting vulnerable children.** Wellington: New Zealand Government. <http://www.msd.govt.nz/documents/about-msd-and-our-work/work-programmes/policy-development/white-paper-vulnerable-children/white-paper-for-vulnerable-children-childrens-action-plan-summaries.pdf>

The White Paper on Vulnerable children sets out the Government's programme for addressing child maltreatment by identifying the most vulnerable children and targeting services to them. Volume I sets out the actions the Government will take to improve outcomes for the most at-risk children and Volume II contains the evidence and detailed policy rationale for each of the proposals. The White Paper outlines a set of reforms that aim to: help ensure that parents, caregivers, family/whānau, and communities understand and fulfil their responsibilities towards children; give professionals new tools to identify vulnerable children and act earlier; build a new community-based approach to meeting the needs of children at risk of maltreatment as early as possible; reinforce joint responsibility and action across government to improve outcomes for children within target populations, develop a new direction for the way that Child, Youth and Family, justice, health, education and welfare agencies, professionals and other organisations work together, and an information platform through which they can record and share information; develop a new cross-agency Strategy for Children and Young People in Care; build a children's workforce that is responsive to the needs of vulnerable children; and introduce a range of new measures to manage adults at high risk of abusing children. The Action Plan sets out a three-year plan for achieving the changes outlined in the White Paper. The Children's Action Plan has its own website: <http://childrensactionplan.govt.nz/> which is updated regularly.

International guidelines

National Collaborating Centre for Women's and Children's Health, National Institute for Health and Clinical Excellence. 2009. **When to suspect child maltreatment.** London: RCOG Press.

<https://www.nice.org.uk/guidance/cg89/resources/guidance-when-to-suspect-child-maltreatment-pdf>

The purpose of this guideline is to provide healthcare professionals with a summary of the clinical features associated with child maltreatment that may be observed when a child presents for care. It is intended to raise awareness in health professionals who are not specialists in child protection, not to provide recommendations on how to diagnose, confirm or disprove child maltreatment. It covers the alerting features in children and young people (under the age of 18) of physical, sexual and emotional abuse, neglect, and fabricated or induced illness.

The full guideline, which contains more details on the evidence underpinning the guideline, can be found here: <https://www.nice.org.uk/guidance/cg89/resources/cg89-when-to-suspect-child-maltreatment-full-guideline2>.

The evidence tables which detail the studies used to develop each section of the guideline can be found here: <https://www.nice.org.uk/guidance/cg89/resources/cg89-when-to-suspect-child-maltreatment-evidence-tables2>

Evidence-based medicine reviews

Social Policy Evaluation and Research Unit. 2014. **Effective parenting programmes**. Wellington: Families Commission. <http://www.familiescommission.org.nz/sites/default/files/downloads/Effective-Parenting-Programme-Report.pdf>

This report reviewed the effectiveness of parenting programmes, as a means of reducing the risk of maltreatment for vulnerable children aged 0–6 years. It included both international and New Zealand programmes. The review of international research focused on programmes that had been evaluated through RCTs or other rigorous research designs involving comparison groups. The programmes that had the most evidence for a reduction in maltreatment were: Nurse Family Partnership (US), Early Start (NZ), Parent-Child Interaction Therapy (US), and SafeCare (US). These programmes also had other positive parenting and child outcomes but were less successful at overcoming parental issues such as maternal depression, drug and alcohol use, and domestic violence. Common elements of effective programmes included factors related to staffing and infrastructure, programme design, content and delivery, and ongoing monitoring and evaluation, but further research is needed to determine which are the most important components and the interaction between components. Further research is also needed on the best ways to engage and retain parents in programmes. When implementation of a programme is being planned it is important to consider the following points: programme appropriateness to local needs, who is targeted, the delivery setting, accessibility and costs, technical assistance that may be required, cultural appropriateness of the programme and the degree to which it can be adapted. This report identified various parenting programmes that are available in New Zealand. It concluded that: Early Start (a comprehensive home-visiting service, developed in Christchurch) has good evidence of effectiveness; Incredible Years and Triple P are supported by international evidence and limited lower quality New Zealand evidence; Parents as First Teachers is based on the US Parents as Teacher programmes which is considered to be evidence-based; international research supports home visiting approaches; and HIPPO programmes which aim to prepare children for formal schooling are supported by good overseas, and some New Zealand, evidence. While there are some programmes specifically designed for Māori and Pacific parents, this review found that little research had been done on their effectiveness and that this knowledge gap needs to be addressed.

Poole MK, Seal DW, Taylor CA. 2014. **A systematic review of universal campaigns targeting child physical abuse prevention**. Health Education Research, 29(3), 388–432. <http://her.oxfordjournals.org/content/29/3/388.abstract>

This review aimed to assess the impact of universal campaigns with a media component that were aimed at preventing child physical abuse (CPA). It included 17 studies of 15 campaigns conducted in five countries from 1989 to 2011. A variety of different evaluation designs were used and some studies used more than one type. Seven studies were evaluated via RCTs, but most studies used quasi-experimental designs. Only three studies assessed incidence of CPA and two of them found it decreased significantly. Studies also found significant reductions in other relevant outcomes including dysfunctional parenting, child problem behaviours and parental anger, and also increases in parental self-efficacy and knowledge of concepts and actions relevant to child abuse prevention. The most common targets of campaigns were: lack of knowledge of positive parenting techniques, parental impulsivity, the stigma of asking for help, inappropriate expectations of child behaviour for a child's developmental stage, and inadequate social support. The review authors concluded that the evidence base for universal campaigns intended to prevent CPA remains inconclusive as only Triple-P has been rigorously evaluated. They state that further work is needed to develop and rigorously evaluate universal CPA prevention interventions which could shift population norms regarding CPA.

Winokur M, Holtan A, Batchelder Keri E. 2014. **Kinship care for the safety, permanency, and well-being of children removed from the home for maltreatment**. Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD006546.pub3. <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD006546.pub3/abstract>

This review aimed to evaluate the effect of kinship care placement (placing children who cannot live at home with other family members or with friends) on the safety, placement stability, and well-being of children removed from the home for maltreatment. It included 122 quasi-experimental studies involving 666,615 children. The studies had considerable methodological and design weaknesses and unclear risks of selection bias, performance bias, detection bias, reporting bias, and attrition bias, with the highest risk associated with selection bias and the lowest associated with reporting bias. A total of 102 studies were included in the qualitative synthesis and results from 71 studies were included in the meta-analysis. Only 13 of the 102 studies were conducted outside the US. Meta-analyses suggested that children in kinship foster care experience fewer behavioural problems (standardised mean difference effect size -0.33 , 95% CI -0.49 to -0.17), fewer mental health disorders (odds ratio (OR) 0.51 , 95% CI 0.42 to 0.62), better well-being (OR 0.50 , 95% CI 0.38 to 0.64), and less placement disruption (OR 0.52 , 95% CI 0.40 to 0.69) than do children in non-kinship foster care. There was no difference in family reunification rates between children in kinship care and children in non-kinship foster care, although children in non-kinship foster care were more likely to be adopted (OR 2.52 , 95% CI 1.42 to 4.49), while children in kinship foster care were more likely to be in guardianship (OR 0.26 , 95% CI 0.17 to 0.40). Children in non-kinship foster care were more likely to utilise mental health services (OR 1.79 , 95% CI 1.35 to 2.37). The review authors concluded that, bearing in mind the poor quality of the included studies, the evidence supports treating kinship care as a viable out-of-home placement option.

Macvean M, Mildon R, Schlonsky A, et al. 2013. **Evidence review: An analysis of the evidence for parenting interventions for parents of vulnerable children aged up to six years.** Melbourne: Parenting Research Centre. http://www.parentingrc.org.au/images/stories/NZ_EvidenceReview_ParentingInterventions/MainReport_EvidenceReview_ParentingInterventions_NZ_June2014.pdf

This evidence review was commissioned by the Families Commission to provide background information for the Social Policy Evaluation and Research Unit review (above). It provides details of effective parenting programmes to guide the development and implementation of programmes in New Zealand. It used a Rapid Evidence Assessment (REA) methodology. In total, the review identified 81 parenting interventions, for parents of vulnerable children aged 0–6 years, that focused particularly on prevention of child maltreatment. Twelve of these were considered “effective” because at least one RCT indicated positive effects maintained at six months. Only one of these twelve received the highest evidence rating, “well supported” (at least 2 RCTs demonstrated effectiveness with effects lasting 12 months or more). This intervention was the pre- and post-natal home visiting programme Nurse Family Partnership, which demonstrated an effect on child maltreatment and other relevant outcomes 15 years after the intervention had finished. Of the other 11 effective interventions, four were rated “supported” and seven, “emerging”. There were 22 interventions where there was insufficient evidence, and 10 which failed to demonstrate an effect. Thirty-eight interventions were rated “pending” as they had not yet demonstrated maintenance of an effect. The review authors found no interventions which could be rated “Concerning practice”. The only New Zealand intervention evaluated by an RCT, Early Start, was rated “emerging” as the reviewers located one RCT which indicated good results on a number of key child, parent and family outcomes, some of which were maintained at nine years. Most of the reviewed interventions were delivered by professionals, typically in the home. They most commonly targeted child behaviour, child development and parent-child interaction. There was little evidence for interventions that targeted specific groups such as indigenous families or parents with intellectual disabilities. The reviewers identified 14 common elements in effective interventions: structured or planned sessions, assessment of the child and family and development of an individualised plan, content often delivered by discussion with the nature of the content largely focused on child behaviour and strategies for managing it (especially positive, non-punitive approaches), parent-child interactions, child health, development and safety, emotional regulation, and issues relating to family wellbeing and life course.

Moyer VA. 2013. **Primary care interventions to prevent child maltreatment: U.S. Preventive Services Task Force recommendation statement.** *Annals of Internal Medicine*, 159(4), 289–95. <http://dx.doi.org/10.7326/0003-4819-159-4-201308200-00667>

This recommendation statement from the USPSTF is based on a systematic review (see below) which considered studies of asymptomatic children who received primary care-accessible interventions to prevent child maltreatment. The reviewers identified one fair-quality study of an intervention provided in a clinical setting (the Safe Environment for Every Kid model) and ten fair quality studies of home visitation programmes to prevent child maltreatment, all published since the previous (2004) USPSTF recommendation. The USPSTF concluded that the current evidence was insufficient to assess the balance of benefits and harms of primary care interventions to prevent child maltreatment in children who do not have any signs or symptoms of maltreatment. The systematic review, which contains more details on the relevant studies, is:

Nelson HD, Selph S, Bougatsos C, et al. 2013. **Behavioral interventions and counseling to prevent child abuse and neglect: Systematic review to update the U.S. Preventive Services Task Force recommendation. Evidence synthesis No. 98 AHRQ Publication No. 13-05176-EF-1.** Rockville (MD): Agency for Healthcare Research and Quality (US). <http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0052380/> .

Louwens ECFM, et al. 2010. **Screening for child abuse at emergency departments: a systematic review.** *Archives of Disease in Childhood*, 95(3), 214–18. <http://adc.bmj.com/content/95/3/214.long>

This review assessed the effectiveness of interventions applied at emergency departments on increasing the detection rate of confirmed cases of child abuse. Four observational trials were included in the review (n=8907). After implementation of the screening tool, the rate of detected cases of suspected child abuse increased by 180% (weighted mean in three studies). However, there were no significant increases in the number of confirmed cases of child abuse, reported in two out of four studies. In one study, 11 of the 36 cases (30%) were found to be true accidents after a full assessment, and the other study reported 58 (26%) confirmed cases out of 220 suspected cases. The authors concluded that there was no conclusive evidence to confirm that screening interventions at EDs result in increased detection of cases of confirmed abuse.

Other relevant publications

Social Policy Evaluation and Research Unit. 2014. **Assessment of the design and implementation of the children's teams**. Wellington: Families Commission.

http://www.familiescommission.org.nz/sites/default/files/downloads/Childrens-Teams-Assessment_0.pdf

Children's teams are a key component of the Government's Children's Action Plan. They bring together professionals and NGOs from across all the sectors to meet the needs of vulnerable children and their families. Each team has a lead professional who is the key point of contact for the child. This report by the Social Policy Evaluation and Research Unit (SuPERU) addresses the question: Is the design right? The SuPERU identified a number of elements critical to the performance of the Children's Team model and grouped these under five headings: planning and development, partnership, implementation, systems change, and scaling up. Reviewing the two regional demonstration sites in Rotorua and Whangarei, it found that progress had been made in some elements such as building a shared vision, collective ownership and building a working model but that there were challenges in other areas such as information sharing and funding and accountability processes. The Social Policy Evaluation and Research Unit stated that, as the model develops and expands, increased attention will probably need to be paid to workforce capacity and common accountability measures. It concluded that the Children's Teams were implemented before their design was universally agreed on, understood and supported at all levels across all sectors and therefore expectations regarding what the demonstration sites would achieve were probably inappropriately high but that nevertheless the model was up and running and there were signs of a more integrated planning approach to service design which was getting closer to meeting the governance, resourcing and timeframe requirements for successful service development and implementation.

Murphy C, Paton N, Gulliver P, et al. 2013. **Understanding connections and relationships: Child maltreatment, intimate partner violence and parenting**. Auckland: New Zealand Family Violence Clearinghouse, The University of Auckland. <https://nzfvc.org.nz/issues-papers-3>

This issues paper reviews the evidence on the frequency with which child maltreatment co-occurs with intimate partner violence. It reports that the United States NatSCEV study found that over their lifetimes 57% of those who had witnessed intimate partner violence were maltreated, compared to 11% of those who had not. It states that there needs to be more recognition of the links between child maltreatment and intimate partner violence and of the importance of supporting children's relationships with the non-abusive parent.

Fergusson DM, McLeod GFH, Horwood LJ. 2013. **Childhood sexual abuse and adult developmental outcomes: Findings from a 30-year longitudinal study in New Zealand**. *Child Abuse & Neglect*, 37(9), 664–74

This paper reports on data gathered from over 900 participants in the Christchurch Health and Development Study. At ages 18 and 21 young people were asked about child sexual abuse (CSA) before age 16. Mental health, psychological wellbeing, sexual risk-taking behaviours, physical health and socioeconomic outcomes were assessed up to till age 30. The study found that, after adjustment for confounding by child, socio-demographic and family functioning factors, there were small to moderate associations between the extent of CSA and increased rates of major depression, anxiety, suicidal ideation, suicide attempts, alcohol dependence and illicit drug use. At age 30, CSA was associated with increased rates of PTSD symptoms, decreased self-esteem and decreased life satisfaction. In addition, CSA was associated with decreased age of first sexual activity, greater number of sexual partners, increased medical contacts for physical health problems, and welfare dependence. The attributable risks for the mental health problems ranged from 5.7% to 16.6%. The study authors concluded that, although the individual effects sizes for CSA are typically small to moderate, the cumulative effect of CSA on adult developmental outcomes is clearly considerable.

Penehira M, Doherty L. 2013. **Tu mai te oriori, nau mai te hauora! A kaupapa Māori approach to infant mental health: adapting Mellow Parenting for Māori mothers in Aotearoa, New Zealand**. *Pimatisiwin: A Journal of Aboriginal and Indigenous Community Health*, 10(3), 367–82. <http://www.pimatisiwin.com/online/wp-content/uploads/2013/02/09PenehiraDoherty.pdf>

This paper reports on a pilot study which aimed to evaluate the acceptability and effectiveness of Hoki ki te Rito (an Māori cultural adaptation of Mellow Parenting) an intensive parenting programme delivered to Māori mothers from socially disadvantaged areas in South Auckland who had children aged 0–5 years and relationship difficulties along with child behaviour difficulties. The programme was well received and the mothers and grandmothers who attended reported significant increases in their own wellbeing, their feelings of self-esteem and adequacy, their ability to cope with their parenting role and their children's behaviour, confidence in their cultural identity, and their children's social skills, as well as reductions in their children's problem behaviours.

Wessels I, Mikton C, Ward C L, et al. 2013. **Preventing violence: Evaluating outcomes of parenting programmes**. Geneva: World Health Organization. http://apps.who.int/iris/bitstream/10665/85994/1/9789241505956_eng.pdf

Child maltreatment is more likely to occur in families that have difficulties with developing stable, warm and positive relationships. Parenting programmes are one way to strengthen parenting, and, although they do not always specifically aim to prevent violence, they have the potential to do so. This brief and accessible publication was designed for policy makers, government officials, programme developers, NGOs, community-based organisations and donors in low to middle income countries. Section one deals with outcome evaluation and Section Two reviews the evidence for the effectiveness of parenting programmes aimed at preventing violence, discusses adapting programmes from one culture to another, and sets out the characteristics common to effective programmes.

Fergusson D M, Boden J, Horwood J. 2012. **Early Start evaluation report: nine year follow-up**. Wellington: Ministry of Social Development. <http://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/evaluation/early-start-evaluation-report-nine-year-follow-up.pdf>

Early Start is a home visiting service aimed at families of infants who are facing severe social, economic or emotional challenges. It was set up in Christchurch in the mid 1990s. This report describes the evaluation of Early Start via a RCT which involved comparing 220 families who received Early Start with a control group of 223 families who did not receive Early Start over a nine-year follow-up period. Families were identified for inclusion in the study by Plunket Nurses. At 36 months, the children in the Early Start group had greater use of health services; lower rates of hospital attendance for childhood accidents; greater use of early childhood education and dental services; lower rates of parental reported childhood physical abuse; less punitive and more positive parenting; and lower rates of problem behaviours. By nine year follow-up, the early start children had 33% lower rates of hospital; attendance for childhood accidents, 50% lower rates of parent-reported physical child abuse, more positive mean scores on measures of parenting competence and punitive parenting and lower parent-reported scores for child behaviour problems. The effect sizes ranged from small to moderate. At neither 36 months nor nine years were there any benefits of Early Start for a wide range of parental and family outcomes including maternal depression, parental substance abuse, family violence, family material and economic wellbeing and family stress and adversity. The report's authors stated that these findings highlighted the need to develop better links and integration between home visiting services and other family-related services such as family planning services, adult mental health services, educational and career support services, budgeting services and relationship services. They also stated that key factors in the success of Early Start were probably the research base of the programme, professionally trained staff, and the development of standards and service manuals for the programme.

The paper below contains more detail on the methods of the RCT and the statistical analysis of the results:

Fergusson DM, Boden JM, Horwood LJ. 2013. **Nine-Year follow-up of a home-visitation program: A randomized trial**. *Pediatrics*, 131(2), 297-303. <http://pediatrics.aappublications.org/content/131/2/297.abstract>

Dalziel K, Segal L. 2012. **Home visiting programmes for the prevention of child maltreatment: cost-effectiveness of 33 programmes**. *Archives of Disease in Childhood*, 97(9), 787–98. <http://adc.bmj.com/content/97/9/787.abstract>

This Australian study aimed to determine the cost-effectiveness of home visiting programmes for the prevention of child maltreatment. The study authors evaluated 33 programmes identified through a systematic review of published trials. For the 25 programmes that were not dominated (i.e. did not cost more than another equally effective or better intervention) cost effectiveness estimated were derived. The incremental cost of home visiting (compared to usual care) ranged from A\$1800 to A\$30,000 per family. Estimated of costs per case of child maltreatment averted ranged from \$A22,000 to several million dollars. Seven of the 22 programmes (32%) of at least adequate quality were found to be cost saving when lifetime cost offsets were included, including the New Zealand Early Start programme. The study authors concluded that there is wide variation in the costs of home visiting programmes which aim to prevent child maltreatment and that the most cost-effective programmes employ professional home visitors in a multi-disciplinary team, target high-risk populations and include more than just home visiting (e.g. phone contact, referral to other services, clinic visits, transport assistance, social work services, housing assistance, parenting groups).

Centre for Applied Research in Economics. 2012. **Vulnerable children: Can administrative data be used to identify children at risk of adverse outcomes?** Auckland: Centre for Applied Research in Economics (CARE), Department of Economics, University of Auckland. <http://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/research/vulnerable-children/auckland-university-can-administrative-data-be-used-to-identify-children-at-risk-of-adverse-outcome.pdf>

This is the report of a project which aimed to develop and test an automatic risk scoring tool (a predictive risk model, PRM) for assessing the risk that a New Zealand child will have a maltreatment finding at some future time. A PRM is an automated algorithm which gathers data from a variety of sources and uses it to generate a risk score. A "maltreatment finding" is a substantiated finding of emotional, physical or sexual abuse or neglect by age five. In this project the PRM automatically generated a risk score for children either (1) when they arrived on the benefit system or (2) when their circumstances changed once they were supported by a benefit. The report authors noted that 83% of all children having a maltreatment finding by the age of five are seen on a benefit by the age of two. They stated that the most at risk children identified by their model constitute 37% of the children who will have a maltreatment finding by age five, despite being only 5% of the total population. They estimated if children in the 20% most risky benefit spells were offered a programme such as the Nurse Family Partnership (which has been shown in overseas studies to reduce rates of maltreatment by 46%) it would cost \$48,000 per maltreatment finding avoided and that if families entered a programme as soon as a child in the family was identified as being in a top 20% risky benefit spell only a small fraction of children would have a maltreatment finding in the first year. This report also includes a summary of the findings from a literature review covering preventive interventions, the international use of Actuarial Risk Assessment tools in child protection, and the use of PRM in the health sector. The review found that, at the time of writing, no jurisdictions were actively using, or had used, PRMs in child protection.

Kerslake Hendricks A, Stevens K. 2012. **Safety of subsequent children: International literature review**. Wellington: Families Commission. <http://www.familiescommission.org.nz/sites/default/files/downloads/SoSC-international-literature-review.pdf>

This review was undertaken at the request of the Minister for Social Development and Employment. It deals with parents who have lost custody of children through a care and protection intervention and who then have additional children who may be at risk. It considers: what will help families to overcome their complex issues so that subsequent children are not at risk, and what can be done to prevent subsequent children being born while parents are still addressing their complex issues. The review identified only one small study directly relevant to the review topic (an Australian review of 14 cases where a young child had died in a family from which other children had previously been removed, supplemented by a literature search) so the scope of the review was broadened to include studies of complex families, studies of high risk or vulnerable infants, recurrent child maltreatment and reviews of child deaths and serious maltreatment incidents. In the literature, the following characteristics were often identified in families with care and protection issues: neglect, previous child removal, parental mental health problems, parental intellectual disability, parental substance abuse, family violence. Within these families there are characteristics of children that can make them more vulnerable: being born prematurely and/or affected by in-utero exposure to alcohol and/or drugs, being disabled, being more difficult or less rewarding (from a parent's perspective) than other siblings, returning home from foster care especially if suffering the loss of an attachment figure (often the foster carer), and being a teenager displaying risk-taking or anti-social behaviour. It is easiest to identify subsequent children in families where a previous child had been removed if cases are still active with social services. Where this is not the case effective referral pathways are needed. There is potential for improved identification of subsequent children through education of professionals and the public, alert systems, mandatory reporting, and better relationships and information sharing between health and social services, but there is a need for research evaluating of the effectiveness of these approaches. One families are referred, the literature suggests that effective assessments are those which: are conducted by well-trained staff, use professional judgement as well as assessment tools, consider the cumulative and interactive effects of families' risks and strengths, consider family structures especially the presence of new men in households, and are undertaken in already known households in response to new information or changing circumstances. No literature relating interventions specifically for families where a previous child had been removed was identified but the review authors discuss a variety of programmes for "complex families" and state that the evidence for the effectiveness of these is mixed. While some help to improve parent-child relationships and parental knowledge, and reduce child abuse, they tend to be less effective at addressing adults' problems or families' broader social needs over the long term. The review authors did not find any programmes with long term effectiveness in preventing neglect. They stated that it is known that vulnerable women are likely to have unplanned pregnancies and suggest that better contraceptive services that are easy to access, non-stigmatising and subsidised may be needed. In their conclusions they stated that there are significant knowledge gaps in the research literature regarding the needs of families who have had children removed and how to protect subsequent children born into such families.

Cram F. 2012. **Safety of subsequent children: Māori children and whānau** Wellington: Families Commission. <http://www.familiescommission.org.nz/sites/default/files/downloads/SoSC-Maori-and-Whanau.pdf>

This review is a companion to the one above. It seeks to understand the reasons why Māori children and families are over-represented in the welfare system, particularly in child removal statistics, and how whānau who have previously had a child removed can be better supported. It uses Mason Durie's holistic Māori wellness model, Te Pae Mahutonga, to examine Mauri Ora (access to Māori cultural identity, Te Ōranga (participation in society) and Toiora (healthy lifestyles) as determinants of Māori whānau wellness. It then explores the Māori initiatives that support and strengthen whānau as an expression of Te Mana Whakahaere (autonomy). As yet, the impact of Kaupapa Māori parenting and whānau support programmes and services on child maltreatment rates has not been systematically examined and it is probably unrealistic to expect that such programmes can achieve good and long lasting results unless attention is also paid to the social and economic disparities faced by many Māori whānau in New Zealand.

Te Puni Kōkiri. 2010. **Arotake tūkinō Whānau literature review on family violence**. Wellington: Te Puni Kōkiri. <http://www.tpk.govt.nz/en/in-print/our-publications/fact-sheets/safer-whanau/download/tpk-family-violence-literature-review.pdf>

This literature review found that there was little research on uniquely Māori approaches to reducing family violence. Sections in this publication cover: an overview of family violence among Māori today, traditional Māori views on family violence, the impact of colonisation on traditional views and practices, an exploration of the ways in which traditional knowledge have been, and can be, used to create interventions to address family violence, definitions of family violence and the need to broaden the definition of family violence to include the complexities of relationships within whānau and the effects of colonisation and racism on whānau, and an overview of some kaupapa Māori based programmes.

Mardani J. 2010. **Preventing child neglect in New Zealand: A public health assessment of the evidence, current approach, and best practice guidance.** Wellington: Office of the Children's Commissioner.
<http://www.occ.org.nz/assets/Uploads/Reports/Child-abuse-and-neglect/Preventing-child-neglect.pdf>

This report reviews the nature and consequences of child neglect; and the effectiveness of interventions to prevent the recurrence of neglect. It begins with a literature review which found that targeted preventive programmes such as home visiting, parent education and multi-component interventions have shown some benefits but there no evidence for the effectiveness of interventions aimed at preventing recurrence of child neglect. It also found some limited evidence for the effectiveness of resilient peer treatment, imaginative play training and multi-systemic therapy for improving the wellbeing of neglected children although there was a lack of rigorous studies of treatments for neglected children and their families. The report then describes the prevalence of neglect in New Zealand, using Child Youth and Family (CYF) data from 2009. It summarises government agencies' responses to neglect and compares these responses to best practice. The report includes findings from a series of stakeholder interviews with professionals from CYF, Police, and the health and education sectors. The report concludes with recommendations aimed at key government agencies for strengthening the prevention of recurrent neglect.

Friends National Resource Center for Community-Based Child Abuse Prevention. 2009. **Evidence-based and evidence-informed programs.** Chapel Hill, NC: Friends National Resource Center for CBCAP.
http://friendsnrc.org/joomdocs/eb_prog_direct.pdf

This US publication was designed to assist Community-Based Child Abuse Prevention Lead Agencies to identify possible programme they may wish to consider funding. There is a summary matrix listing programmes reviewed by four national registries of evidence-based programmes, followed by a programme directory providing more detail and references for each of the programmes. The following programmes are reported to be well-supported by evidence: Early Head Start, Families and Schools Together, Incredible Years, Nurse Family Partnership, Parent Child interaction Therapy, Strengthening Families and Triple P.

Websites

New Zealand Family Violence Clearinghouse. <https://nzfvc.org.nz/>

The New Zealand Family Violence Clearinghouse is the national centre for collating and disseminating information about domestic and family violence in Aotearoa New Zealand. It is funded by the Families Commission and located at the School of Population Health, the University of Auckland. The library on this site contains a large number of resources, particularly New Zealand publications. The library search engine does not make it easy to search for evidence-based prevention interventions specifically so the assistance of a librarian may need to be sought.

Cardiff Child Protection Systematic Reviews (Core Info). <http://www.core-info.cardiff.ac.uk/>

Cardiff Child Protection Systematic Reviews (Core Info) is a collaboration between the National Society for the Prevention of Cruelty to Children and the Early Years research section of the Cochrane Institute of Primary Care and Public Health, Department of Child Health, School of Medicine, Cardiff University. Their site provides a series of systematic reviews of the literature relating to physical abuse and neglect of children. The review topics include: dental neglect, early years neglect/emotional abuse, parent-child interaction, school aged neglect/emotional abuse, bites, bruising, burns, fractures, neurological injuries, oral injuries, retinal findings, spinal injuries, and visceral injuries. These reviews are of particular interest to practitioners who need to recognise and report on abuse and neglect.

Children's Bureau, Administration for Children and Families, US Department of Health and Human Services. **Child Welfare Information Gateway.** <https://www.childwelfare.gov/>

This site contains resources on topics including child welfare, child abuse and neglect, out-of-home care, and adoption. The page on evidence-based practice in child abuse prevention programmes, which can be found here: <https://www.childwelfare.gov/preventing/evidence/> may be especially helpful for those considering implementing such programmes.

The California Evidence-Based Clearinghouse for Child Welfare. <http://www.cebc4cw.org/>

The primary purpose of this website is to provide searchable database of programmes that can be utilized by professionals who serve children and families involved with the child welfare system. The page on Home Visiting Programs for Prevention of Child Abuse and Neglect, <http://www.cebc4cw.org/topic/home-visiting-for-prevention-of-child-abuse-and-neglect/> provides information on various programmes and rates programmes according to the strength of the research evidence supporting them. The only programme well-supported by research evidence (at least two RCTs, at least one of which showed a sustained effect at least one year) is *Nurse-Family Partnership* which provides home visits by registered nurses to first-time, low-income mothers, beginning in pregnancy and continuing until the child's second birthday. The page on Prevention of Child Abuse and Neglect (Secondary) Programs, which can be found here: <http://www.cebc4cw.org/topic/prevention-of-child-abuse-and-neglect-secondary/> provides information on programmes targeted at individuals or families who are at high risk for maltreatment with the aim of preventing abuse or neglect from occurring. The only programme well-supported by research evidence is *The Incredible Years*, which involves training programmes for parents, children and teachers. The curricula are designed to promote emotional and social competence; and to prevent, reduce, and treat behaviour and emotional problems in young children.

Note: The publications listed were identified using the search methodology outlined in **Appendix 1**

INJURIES ARISING FROM ASSAULT IN YOUNG PEOPLE

Introduction

Witnessing, perpetrating, or being a victim of assault is a relatively common experience for young people in New Zealand. The Youth '12 survey of 8,500 secondary school students from across New Zealand found that one third (33%) of students reported being hit or physically harmed by someone, and 14% reported being in a serious physical fight, in the last 12 months [358]. Assault-related injuries serious enough to require the attention of a doctor, nurse or physiotherapist were less common, however, affecting just over 2% of all students in the previous 12 months (2.8% of males and 1.5% of females) [359]. Of all age groups in the population, young people aged 15–24 years are the most likely to be victims of violence [389].

The Christchurch longitudinal study examined the factors which place young people at risk of physical assault. It found that the major predictors of assault victimisation during late adolescence included both childhood factors and concurrent factors. The significant childhood predictors were being male, a history of parental alcohol problems, regular or severe physical punishment, and early adolescent conduct problems. The significant predictors during late adolescence were alcohol abuse/dependence and violent and other offending [390]. The authors of this study stated that their findings are consistent with those of other studies which have shown a considerable overlap between the perpetrators and victims of violent crime.

Recent alcohol consumption by both the perpetrators and the victims of assault is common, and associated with more severe injury [391]. A recently published study examining the effect on assault rates of the lowering of the minimum alcohol purchasing age in New Zealand (in 1999) found that it increased weekend assaults resulting in hospitalisations among young men aged 15 to 19 years (relative to young men aged 20 to 21 years) but had no statistically significant effect in young women [392].

With these issues in mind, the following section explores hospital admissions and mortality from injuries arising from assault in young people aged 15–24 years using information from the National Minimum Dataset and the National Mortality Collection.

Data Source and Methods

Indicator

1. Hospital admissions for injuries arising from assault in young people aged 15–24 years
2. Deaths from injuries arising from assault in young people aged 15–24 years

Data Source

1. Hospital admissions

Numerator: National Minimum Dataset: Hospital admissions in young people aged 15–24 years with a primary diagnosis of injury (ICD-10-AM S00–T79) and an external cause code of intentional injury (ICD-10-AM X85–Y09) in any of the first 10 external cause codes. As outlined in **Appendix 3**, in order to ensure comparability over time, all cases with an emergency department specialty code (M05–M08) on discharge were excluded.

Denominator: NZ Statistics NZ Estimated Resident Population

2. Mortality

Numerator: National Mortality Collection: Deaths in young people aged 15–24 years with a clinical code (cause of death) of intentional injury (ICD-10-AM X85–Y09).

Denominator: NZ Statistics NZ Estimated Resident Population

Interpretation

The limitations of the National Minimum Dataset are discussed at length in **Appendix 3**. The reader is urged to review this Appendix before interpreting any trends based on hospital admission data.



New Zealand Distribution and Trends

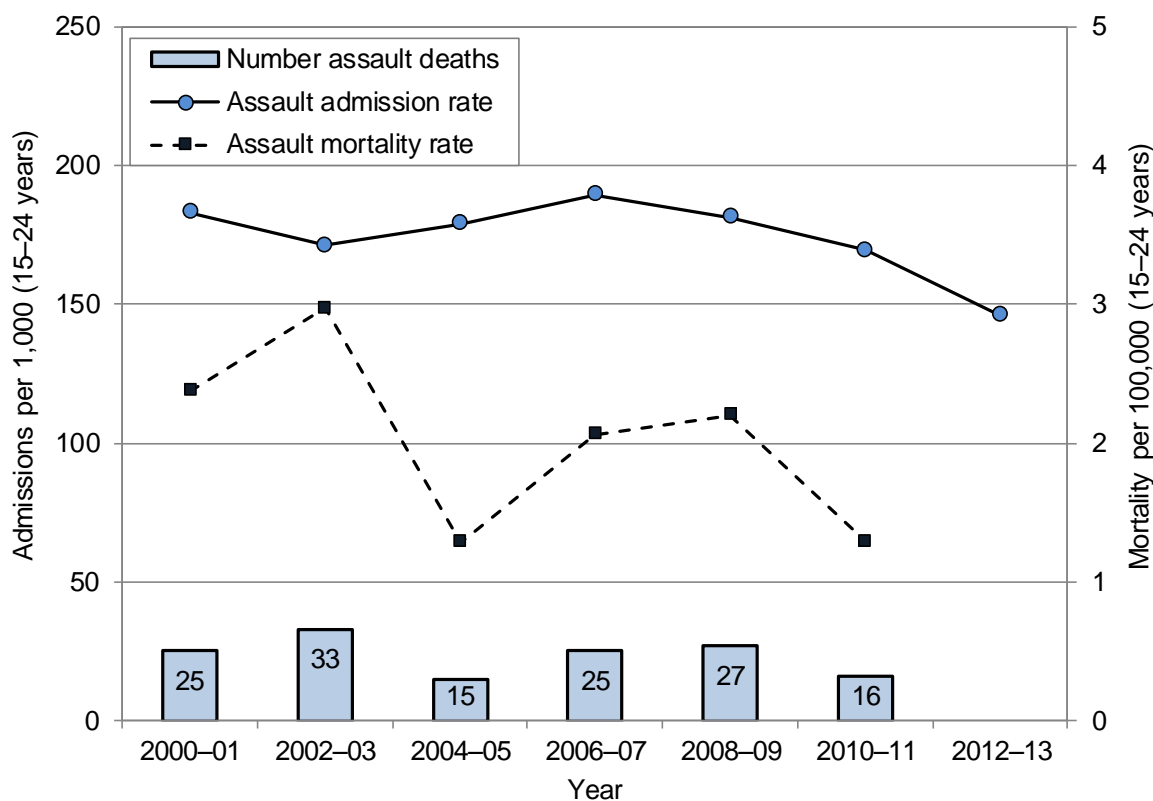
New Zealand Trends

In New Zealand during 2000–2013, hospital admissions for injuries arising from assault in young people remained relatively static, while mortality during 2000–2013 fluctuated from year to year. On average during 2000–2011, around 12 young people per year died from injuries arising from an assault (**Figure 191**).

Distribution by Age and Gender

In New Zealand during 2009–2013, hospital admissions for injuries arising from assault in males increased rapidly during the mid-to-late teens, reaching a peak at 20 years of age. While assault admissions for females also increased during the teenage years, rates were lower than for males at all ages. Assault mortality during 2007–2011 was also highest for males during their early 20s, although patterns for females were more variable (**Figure 192**).

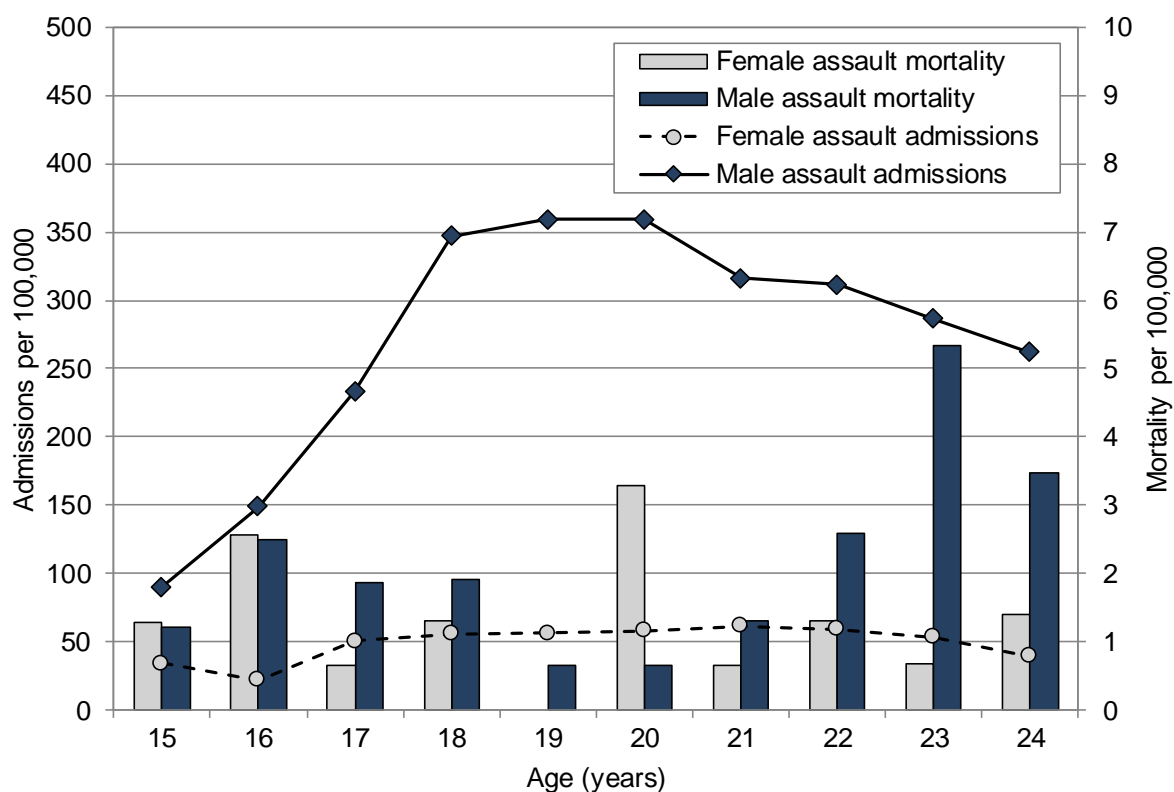
Figure 191. Hospital admissions (2000–2013) and deaths (2000–2011) due to injuries arising from assault in New Zealand young people aged 15–24 years



Source: Numerator: Admissions: National Minimum Dataset (emergency department cases excluded); Mortality: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population; Note: numbers of deaths are per two year period



Figure 192. Hospital admissions (2009–2013) and deaths (2007–2011) due to injuries arising from assault in New Zealand young people by age and gender



Source: Numerator: *Admissions*: National Minimum Dataset (emergency department cases excluded); *Mortality*: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population

Distribution by NZDep Index Decile, Ethnicity and Gender

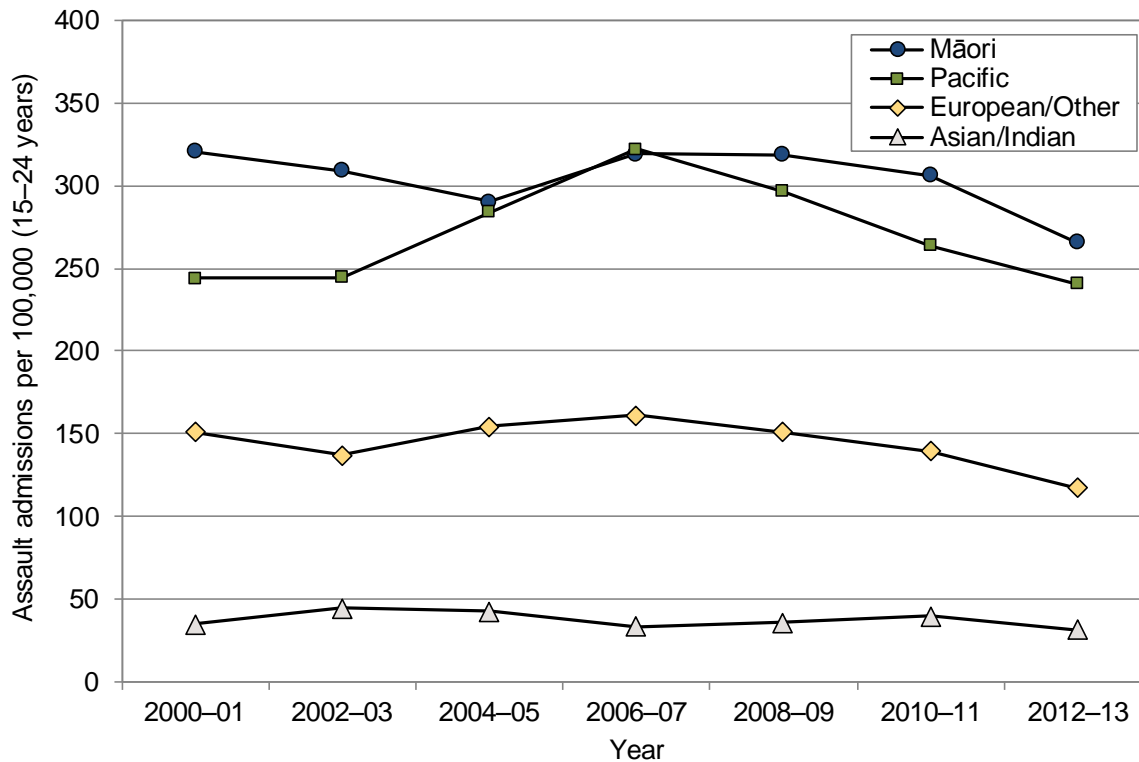
In New Zealand during 2009–2013, hospital admissions for injuries arising from assault were *significantly higher* for Māori and Pacific young people than for European/Other young people, and *significantly lower* for Asian/Indian young people. Admissions were also *significantly higher* for young men than for young women, and for those from less deprived to more deprived areas (NZDep deciles 3–10) (**Table 88**). Similar ethnic differences were seen throughout 2000–2013 (**Figure 193**).

Table 88. Hospital admissions for injuries arising from assault in young people aged 15–24 years by NZDep Index decile, ethnicity and gender, New Zealand 2009–2013

Assault admissions							
Young people 15–24 years							
Variable	Rate	Rate ratio	95% CI	Variable	Rate	Rate ratio	95% CI
NZ Deprivation Index decile				Prioritised ethnicity			
Deciles 1–2	81.93	1.00		Māori	295.78	2.26	2.12–2.40
Deciles 3–4	103.34	1.26	1.11–1.43	Pacific	258.57	1.97	1.81–2.15
Deciles 5–6	135.61	1.66	1.47–1.86	Asian/Indian	35.22	0.27	0.23–0.32
Deciles 7–8	176.34	2.15	1.93–2.40	European/Other	130.93	1.00	
Deciles 9–10	253.24	3.09	2.79–3.43				
Gender							
Female	48.95	1.00		Male	270.95	5.54	5.12–5.98

Source: Numerator: National Minimum Dataset (emergency department cases excluded); Denominator: Statistics NZ Estimated Resident Population; Note: Rate is per 100,000; Rate ratios are unadjusted; Ethnicity is level 1 prioritised; Decile is NZDep06

Figure 193. Hospital admissions for injuries arising from assault in young people aged 15–24 years by ethnicity, New Zealand 2000–2013



Source: Numerator: National Minimum Dataset (emergency department cases excluded); Denominator: Statistics NZ Estimated Resident Population; Note: Ethnicity is level 1 prioritised

Nature of the Injury Sustained

In New Zealand during 2009–2013, the most common types of injuries in young people sustained as the result of an assault were head injuries, in which fractures of the lower jaw, facial bones, and nose were particularly prominent. Upper limb (including hand and wrist) injuries were also common (**Table 89**).



Table 89. Nature of injuries arising from assault in hospitalised young people aged 15–24 years, New Zealand 2009–2013

Primary diagnosis	Number: total 2009–2013	Number: annual average	Rate per 100,000	Percent
Assault admissions for young people aged 15–24 years				
Head injuries				
Fracture of the lower jaw	1,264	252.8	40.71	25.2
Fracture of malar and maxillary bones	295	59.0	9.50	5.9
Fracture of the orbital floor	257	51.4	8.28	5.1
Fracture of the nasal bones	252	50.4	8.12	5.0
Other fractures skull or facial bones	137	27.4	4.41	2.7
Concussion	250	50.0	8.05	5.0
Open wound of head	243	48.6	7.83	4.8
Superficial head injury	131	26.2	4.22	2.6
Traumatic subdural haemorrhage	67	13.4	2.16	1.3
Open wound eyelid/eye area	65	13.0	2.09	1.3
Other head injuries	409	81.8	13.17	8.1
Other injuries				
Injuries to abdomen, spine, and pelvis	307	61.4	9.89	6.1
Fracture of wrist/hand	248	49.6	7.99	4.9
Other injuries to wrist and hand	334	66.8	10.76	6.7
Injuries to elbow and forearm	184	36.8	5.93	3.7
Injuries to knee/lower leg/foot/ankle	137	27.4	4.41	2.7
Injuries to thorax (including rib fractures)	130	26.0	4.19	2.6
Injuries to shoulder/upper arm	108	21.6	3.48	2.2
Injuries to neck	108	21.6	3.48	2.2
Injuries to hip and thigh (incl. fractured femur)	30	6.0	0.97	0.6
Maltreatment	6	1.2	0.19	0.1
Other injuries	58	11.6	1.87	1.2
Total injuries	5,020	1004.0	161.69	100.0

Source: National Minimum Dataset (emergency department cases excluded); Denominator: Statistics NZ Estimated Resident Population

Northern DHBs Distribution and Trends

Northern DHBs vs. New Zealand

In Northland and Counties Manukau during 2009–2013, hospital admissions for injuries arising from assault in young people were *significantly higher* than the New Zealand rate, while in the Auckland and Waitemata DHBs rates were *significantly lower* (**Table 90**).



Table 90. Hospital admissions for injuries arising from assault in young people aged 15–24 years, Northern DHBs vs. New Zealand 2009–2013

DHB	Number: total 2009– 2013	Number: annual average	Rate per 100,000	Rate ratio	95% CI
Young people aged 15–24 years					
Assault admissions					
Northland	248	49.6	259.20	1.60	1.41–1.82
Waitemata	544	108.8	143.20	0.89	0.81–0.97
Auckland	446	89.2	120.93	0.75	0.68–0.82
Counties Manukau	745	149.0	199.60	1.23	1.14–1.33
New Zealand	5,020	1,004.0	161.69	1.00	

Source: Numerator: National Minimum Dataset (emergency department cases excluded); Denominator: Statistics NZ Estimated Resident Population

Northern DHB Trends

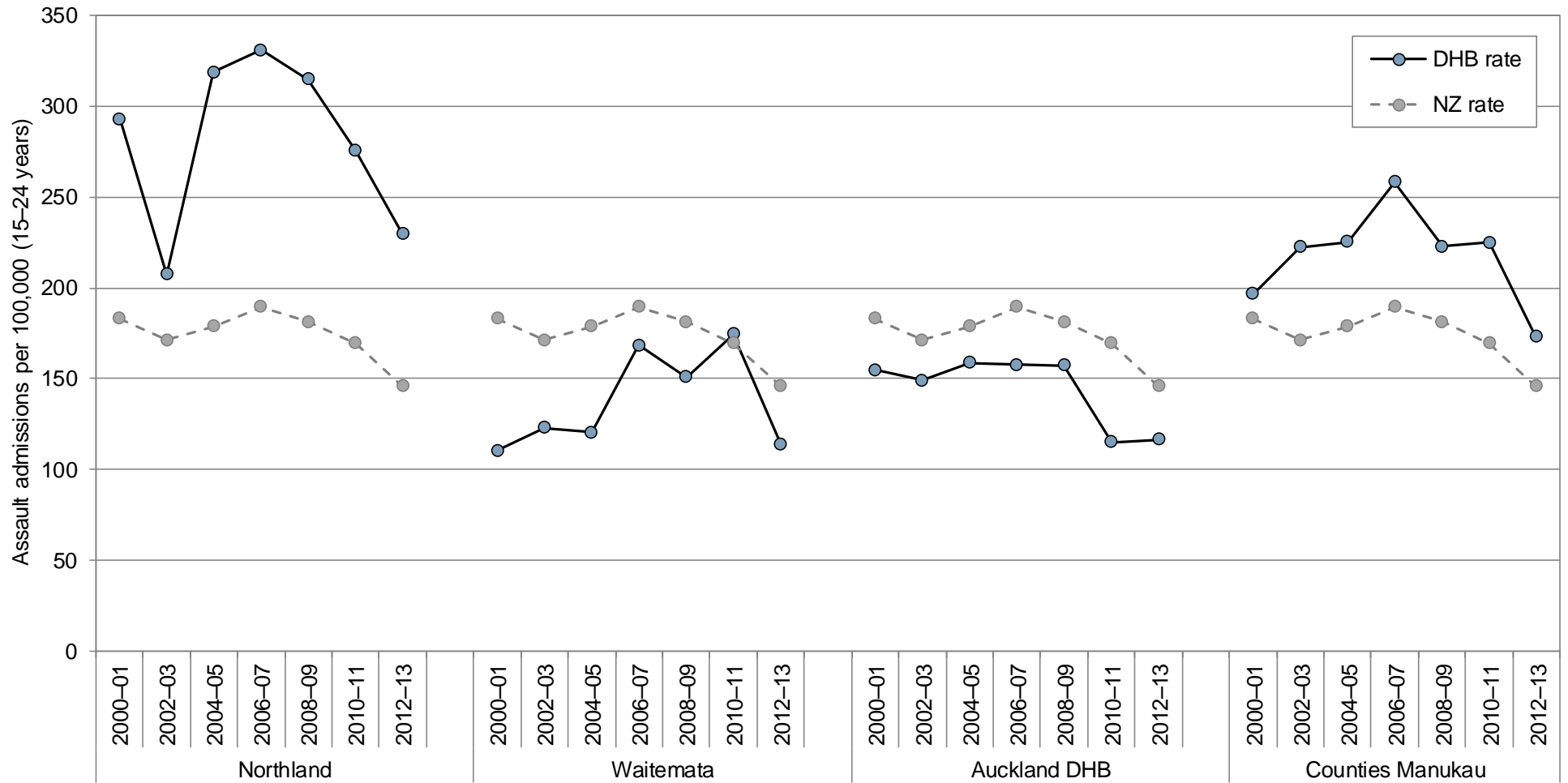
In the Northern DHBs during 2000–2013 hospital admissions for injuries arising from assault in young people fluctuated. However rates in Northland and Counties Manukau were consistently higher than the New Zealand rate, while in the Waitemata and Auckland DHBs rates were generally lower (**Figure 194**).

Northern DHB Mortality

During 2000–2011, 13 Northland, 10 Waitemata, 15 Auckland, and 25 Counties Manukau young people aged 15–24 years died as the result of an assault.



Figure 194. Hospital Admissions for injuries arising from assault in young people aged 15–24 years, Northern DHBs vs. New Zealand 2000–2013



Source: Numerator: National Minimum Dataset (emergency department cases excluded); Denominator: Statistics NZ Estimated Resident Population

Local Policy Documents and Evidence-based Reviews Relevant to the Prevention of Assault in Young People

In New Zealand, there is no single strategy for the prevention of assault in young people. Evidence from a variety of sources will therefore need to be incorporated into local strategies. **Table 91** (below) provides an overview of evidence based reviews which may be useful in this context. In addition, **Table 87** on page 394 summarises publications exploring the prevention of child maltreatment, while **Table 104** on page 430 reviews publications which consider family violence more broadly.

Table 91. Local policy documents and evidence-based reviews relevant to the prevention of assault in young people

Ministry of Justice publications
<p>Ministry of Justice. 2013. Youth crime action plan 2013–2023. Wellington: Ministry of Justice. http://www.justice.govt.nz/publications/global-publications/y/youth-crime-action-plan-full-report/publication/at_download/file</p> <p>This report describes best practice in dealing with youth crime, and sets out the Government’s agenda for the ten years 2013–2023 for advancing policy and practice through three interconnected strategies: partnering with communities, reducing escalation and early and sustainable exits, which are underpinned by governance, workforce and information sharing. It also presents a picture of best practice using eleven central components of the youth justice system to show how the Action Plan will work in the community. It sets out the actions that will be taken by the agencies to implement the strategies and the associated governance, workforce and information sharing requirements. It concludes with a short section outlining the relationships of the Youth Crime Action Plan to other key initiatives or programmes of work in various government agencies.</p>
<p>Crawford R, Kennedy P. 2008. Improving interventions to reduce violent offending by young people in New Zealand. Wellington: Ministry of Justice. http://www.justice.govt.nz/publications/global-publications/i/improving-interventions-to-reduce-violent-offending-by-young-people-in-new-zealand</p> <p>This paper addressed concerns about the perceived increase in the level of youth violence and interventions to reduce violent offending by young people aged 14 to 16 years. Police apprehensions for violent offending among 14 to 16 year olds increased sharply between 2005 and 2006 but it was unclear whether this represented a true increase in violence or changes in reporting and policing. About half of all serious self-reported violent offences are committed by a small, mainly male, group who exhibited persistent conduct disorder during childhood and who are likely to become life course persistent offenders. The paper’s authors found only three therapeutic programmes targeted at recidivist offenders that had evidence of effectiveness from more than one RCT: Multisystemic Therapy, Functional Family Therapy and Multi-dimensional Treatment Foster Care. They reviewed New Zealand interventions and stated that two small scale programmes, Auckland’s Reducing Youth Offending Programme and Hamilton’s Te Hurihanga programme, use Multisystemic Therapy and are supported by the research evidence. They made a number of recommendations relating to: addressing risk factors, especially childhood conduct disorder, involving Māori in interventions, improving the capability and responsiveness of the youth justice system, information management, and expanding programmes of demonstrated effectiveness.</p>
Ministry of Social Development publications
<p>Ministries of Education, Health, Justice and Social Development. 2007. Inter-agency Plan for Conduct Disorder/Severe Antisocial Behaviour 2007–2012. Wellington: Ministry of Social Development. https://www.msd.govt.nz/about-msd-and-our-work/work-programmes/policy-development/anti-social-behaviour/</p> <p>This inter-agency plan was developed to establish a more comprehensive and effective cross-government approach to conduct disorder/severe antisocial behaviour in children (behaviours which are defined as severe, persistent across contexts and over time, and which involve repeated violations of societal and age-appropriate norms). The report identifies key challenges facing services, including inconsistent mechanisms for identifying and determining eligibility for services, gaps in the availability of specialist services, and lack of alignment with the evidence base in some programmes. It sets out the four key proposals for 2007 to 2012: establishing leadership, co-ordination, monitoring and evaluation; transitioning existing service provision to evidence-based, best-practice interventions; establishing an intensive, comprehensive behavioural service for three to seven year-olds; and building a shared infrastructure for the delivery of specialist behavioural services.</p>

New Zealand guidelines

Ministry of Social Development. 2014. **Conduct Disorder: Services guidelines version two February 2014.** Wellington: Ministry of Social Development. <https://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/service-guidelines/conduct-disorder-services-guidelines.pdf>

These guidelines are intended for providers contracted by the Ministry of Social Development to deliver conduct disorder services to young people (10–16 years) referred by Child, Youth and Family. They set out minimum standards for services. They provide information on Provision of Multisystemic Therapy, Functional Family Therapy, Multidimensional Treatment Foster care and residential care. They also cover the principles underpinning the relationships between the Ministry, the provider and the client, incident reporting, missing children or young people, and reporting requirements.

International guidelines

National Institute for Health and Care Excellence. 2013. **Antisocial behaviour and conduct disorders in children and young people: recognition, intervention and management.** London: National Institute for Health and Care Excellence. <http://www.nice.org.uk/guidance/cg158/resources/guidance-antisocial-behaviour-and-conduct-disorders-in-children-and-young-people-recognition-intervention-and-management-pdf>

Children with conduct disorder are at increased risk of becoming involved with the criminal justice system and having a conduct disorder is the most common reason for a child or young person being referred to child and adolescent mental health services. This guideline covers identifying and assessing children with a possible conduct disorder and a range of interventions, including selective prevention, indicated prevention and treatment.

The full guideline, which contains details of the studies and methods used to develop the guideline, and the appendices, can be downloaded here: <http://www.nice.org.uk/guidance/cg158/evidence>. The first three chapters of the full guideline contain a summary of clinical practice and research recommendations and chapters four to eight outline the evidence that underpins the recommendations about the treatment and management of conduct disorders.

Evidence-based medicine reviews

Cassidy T, Inglis G, Wiysonge C, et al. 2014. **A systematic review of the effects of poverty deconcentration and urban upgrading on youth violence.** *Health Place*, 26, 78–87.

Neighbourhoods of concentrated poverty have high levels of youth violence. This review explores interventions which aimed to 'deconcentrate' poverty. It included nine studies: five on urban upgrading, three on resettlement (moving people out of poor neighbourhoods), and two on diversification (encouraging higher SES people to move into poor neighbourhoods). All but one took place in the US. Only one was a RCT. There was no strong evidence to support diversification, but some evidence to support a variety of urban upgrading interventions. Resettlement interventions had the strongest study designs (one controlled trial, one RCT and one cohort study) and evidence of positive effects. The review authors noted the difficulty of conducting methodologically rigorous evaluations of 'upstream' interventions and they considered that this was the reason for the small number of studies identified.

Petrosino A, Turpin-Petrosino C, Hollis-Peel ME, et al. 2013. **'Scared Straight' and other juvenile awareness programs for preventing juvenile delinquency.** *Cochrane Database Systematic Reviews*, 4, Cd002796. <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD002796.pub2/full>

'Scared Straight' and other similar programmes aim to deter juvenile delinquents or children at risk for criminal behaviour from future offending through organised visits to prisons. This review, which is an update of a 2002 review, identified nine RCTs, all of which were included in the 2002 review. The trials were all conducted in the US from 1967 to 1992. In total there were 946 participants, almost all male, with an average age ranging from 15 to 17 years. Meta-analysis of the results of seven studies indicated that the intervention was more harmful (in terms of officially measured criminal behaviour) than doing nothing: fixed effect odds ratio (OR) 1.68, 95% CI 1.20 to 2.36 and random effects OR 1.72, 95% CI 1.13 to 2.62. The authors concluded that programmes such as 'Scared Straight' increase juvenile delinquency and cannot be recommended.

Fagan AA, Catalano RF. 2013. **What Works in Youth Violence Prevention: A Review of the Literature.** *Research on Social Work Practice*, 23(2), 141–56.

This review aimed to identify effective violence prevention interventions that had been evaluated using high quality research designs and had targeted youth from birth through to late adolescence. It included only studies that assessed the actual perpetration of actual physical or sexual violence by youth aged 0–18. The review authors identified 17 interventions that demonstrated significant reductions in violence. Among these 17 were two early childhood programmes, three teacher-led universal school-based programmes, five school- and family-focused interventions for high risk youth in low-income neighbourhoods, three parent training/family therapy interventions, and four community-based interventions. There was considerable diversity in targeted age groups, strategies employed and programme length. The review authors state that, overall, their findings indicate that strategies designed to reduce risk factors and enhance promotive and protective factors across all areas of children's lives can lead to significant reductions in violent behaviours.

Massetti GM, Vivolo AM, Brookmeyer K, et al. 2011. **Preventing youth violence perpetration among girls.** J Womens Health (Larchmt), 20(10), 1415–28.

This report from the CDC reviews the research on risk and protective factors associated with violence and summarises programme effects for girls within the Model and Promising Blueprints for Violence Prevention Initiative programmes. It notes that much of the literature examining risk and protective factors for violent behaviour has focused exclusively on males, and that where females have been included in study samples, results have typically not been reported separately for each sex. The individual factors that longitudinal studies have consistently identified as predictors of violent or delinquent behaviour include hyperactivity/inattention/impulsivity, risk taking/sensation seeking, low academic achievement, exposure to stress and victimization, and early puberty. Relationship risk factors include poor parent-child relationships, lack of parental monitoring/supervision, parent criminal and/or antisocial behaviour, and family conflict and instability. Peer risk factors include gang membership and affiliation with deviant peers. Community risk factors include economic deprivation, neighbourhood crime, community disorganisation, and the availability of drugs, alcohol and firearms. Very few of the evaluations of programmes that were among the Model and Promising Blueprints for Violence Prevention Initiative programmes examined programme effectiveness in preventing violence among girls, but one universal school-based programme, the Olweus Bullying Prevention Program, had positive effects for both girls and boys. Two intervention for high risk youth, Multidimensional Treatment Foster Care and Functional Family Therapy, also had positive effects for girls. The report authors stated that good quality prevalence data needs to be collected, and that further research is needed to determine risk and protective factors, and the effectiveness of programmes and strategies for girls.

Brennan I, Moore SC, Byrne E, et al. 2011. **Interventions for disorder and severe intoxication in and around licenced premises, 1989–2009.** Addiction, 106(4), 706–13.

This systematic review assessed interventions intended to reduce disorder and severe intoxication in and around licenced premises. It included 15 studies, including three RCTs and 12 non-randomised quasi-experimental studies, two of which used RCT methodology. The outcomes measured were intoxication (6 studies), disorder ($n=6$) and intoxication and disorder ($n=3$). Interventions included responsible beverage service training ($n=5$), server violence prevention training ($n=1$), enhanced enforcement of licensing regulations ($n=1$), multi-level interventions ($n=5$), licensee accords ($n=2$) and a risk-focused consultation ($n=1$). The effects of interventions varied, even between studies of similar interventions. Of the studies of violence prevention interventions, it appeared that server training was the most successful, although there was considerable variation in training content. The authors concluded that server training courses designed to reduce disorder have some potential but there is little evidence that server training reduces intoxication and the evidence base is weak.

Snider C & Lee J. 2009. **Youth violence secondary prevention initiatives in emergency departments: a systematic review.** Canadian Journal of Emergency Medicine, 11(2), 161–8.

This review assessed the effectiveness of hospital-based secondary prevention programmes for violently injured youth identified in emergency departments. Seven articles, evaluating four interventions (two RCTs and two retrospective studies), were included. Beneficial effects were identified in one RCT (significant reduction in reinjury rates: treatment group 8.1% versus control group 20.3%, $p=0.05$) and two retrospective studies. A second smaller RCT found no significant effects. Despite some promising results it is difficult to draw conclusions from these studies due to their small size and large losses to follow up. The authors recommend further research to capitalise on the opportunity to intervene in a setting where young people are considered to be in a reflective and receptive state of mind.

Hahn RA, et al. 2007. **Effectiveness of Universal School-Based Programs to Prevent Violent and Aggressive Behaviour: A Systematic Review.** American Journal of Preventive Medicine, 33(2), S114–S29.
http://www.thecommunityguide.org/violence/School_Evidence_review.pdf

This review examined the effectiveness of universal school-based interventions (delivered to all children in a school-based setting) in preventing aggressive and violent behaviour in pre-school and school aged children. The primary outcomes were violence by youths and victimisation of youths. Fifty-three studies (39 prospective and controlled, 5 retrospective or multiple pre-test post-test, 9 single pre-test post-test), with median follow-up of six months, were included in the review. The median overall effect showed a 15% reduction (interquartile range for effect sizes between the 25th and 75th quartiles -44.2 to -2.3) in violence-related outcomes at all school grades examined in intervention groups compared to controls. There was no significant relationship between intervention duration and effect size but the effectiveness of the interventions reduced slightly over time once the interventions had ended. This review forms the basis for the US Government Guide to Community Preventive Services “Violence prevention focused on children and youth: school-based programs” available at <http://www.thecommunityguide.org/violence/schoolbasedprograms.html> .

Limbos MA, et al. 2007. **Effectiveness of interventions to prevent youth violence a systematic review**. American Journal of Preventive Medicine, 33(1), 65–74.

This review assessed the effectiveness of primary (implemented universally to prevent the onset of violence), secondary (implemented selectively with youth at increased risk for violence), and tertiary (focused on youth who had already engaged in violent behaviour) youth violence interventions. Forty-one studies (15 RCTs and 26 other) were included in the review. The heterogeneity of the studies did not allow the authors to pool results and the studies were assessed by 'vote-counting' to identify significant (one or more violence outcome indicators significantly different at the $p < 0.05$ level) and non-significant results. Half (49%) of interventions were identified as effective. Tertiary-level interventions were more likely to report effectiveness than primary or secondary-level interventions. Interventions that RCTs indicated were effective included Responding in Peaceful and Positive Ways, Aban Aya Youth Project, Moving to Opportunity, Early Community-Based Intervention Program, Childhaven's Therapeutic Child-Care Program, Turning Point: Rethinking Violence, and a multisystemic therapy program. Several of the interventions assessed by RCT are discussed in more detail. Due to inadequate data the authors were unable to assess differences between interventions and within subpopulations. They called for increased standardisation of evaluations.

Mytton JA, et al. 2006. **School-based secondary prevention programmes for preventing violence**. Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD004606.pub2
<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD004606.pub2/abstract>

This review assessed the effectiveness of school based violence prevention programmes for children identified as aggressive or at risk of being aggressive. The review identified 56 RCTs, 34 of which had data suitable for inclusion in the meta-analysis. None of the studies reported data on violent injuries. Aggressive behaviour was significantly reduced in intervention groups compared to no intervention groups immediately post intervention (SMD -0.41, 95% CI -0.56 to -0.26). The seven studies reporting 12 month follow-up maintained the reduction in aggressive behaviour (SMD -0.40, 95% CI -0.73 to -0.06). School or agency disciplinary actions in response to aggressive behaviour were non-significantly reduced in intervention groups for nine trials with data (SMD -0.48, 95% CI -1.16 to 0.19) and were not maintained, based on two studies reporting follow-up at two to four months. Interventions designed to improve relationship or social skills appeared to be more effective than interventions designed to teach skills of non-response to provocative situations. Improvements in behaviour were achieved in primary and secondary schools, and for groups of mixed sex versus boys alone, but the longer term benefit and the effects on injury remain uncertain.

Hahn RA, et al. 2005. **The effectiveness of therapeutic foster care for the prevention of violence: A systematic review**. American Journal of Preventive Medicine, 28(2), 72–90.

This review assessed the effectiveness of therapeutic foster care (TFC) for violence prevention in children with severe emotional disturbance and in adolescents with chronic delinquency. In TFC programmes children who cannot live at home are placed with foster parents trained to provide a structured environment for learning social and emotional skills, and monitored at home, school, and leisure activities by programme personnel. Only five studies were included in the review, three prospective trials with a comparison group and two before and after studies with no comparison group. The two studies of TFC for children with severe emotional disturbance yielded inconsistent results. The three studies of TFC for adolescents with chronic delinquency by one research team indicated a reduction in subsequent violent crime (median effect size -71.9%).

This review formed the basis for the US government Guide to Community Preventive Services "Therapeutic foster care to reduce violence" available at <http://www.thecommunityguide.org/violence/therapeuticfostercare/index.html>, which recommends TFC for the reduction of violence among adolescents with chronic delinquency.

Center for the Study and Prevention of Violence, University of Colorado at Boulder. 2004. **Blueprints for violence prevention**. Washington, DC: Office of Juvenile Justice and Delinquency Prevention, U.S. Department of Justice.
<https://www.ncjrs.gov/pdffiles1/ojjdp/204274.pdf>

The Blueprints initiative developed and implemented research-based criteria for evaluating programmes to prevent juvenile violence and delinquency. It reviewed over 600 programmes and identified 11 model programmes and 21 promising programmes that treat youth with problem behaviour and prevent violence and drug use. The Office of Juvenile Justice and Delinquency Prevention funded replications of the Blueprints programmes nationwide, providing training and technical assistance to 42 sites replicating eight of the Blueprints model violence prevention programmes and to another 105 sites (covering ca. 400 schools) implementing a model drug prevention programme. This report describes the Blueprints programmes, discusses the lessons learned about programme implementation, and provides recommendations for programmes designers, funders and implementing organisations and agencies.

Other relevant publications

Alliston L. 2012. **Alcohol-related injury: An evidence-based literature review**. Wellington: Research New Zealand.
http://www.acc.co.nz/PRD_EXT_CSMP/groups/external_providers/documents/reports_results/wpc112196.pdf

This report assesses evidence for the relationship between alcohol and injury and includes a review of interventions to address alcohol-related injury. Multi-component programmes are identified as the approach showing the clearest evidence of effectiveness to date in reducing harm in drinking environments, including violence and traffic crashes, but the report concludes that the development of interventions to reduce the impact of alcohol consumption on the incidence of injury is in its infancy.

The Independent Commission on Youth Crime and Antisocial Behaviour. 2010. **Time for a fresh start: The report of The Independent Commission on Youth Crime and Antisocial Behaviour**. London: The Police Foundation. http://www.police-foundation.org.uk/uploads/catalogerfiles/independent-commission-on-youth-crime-and-antisocial-behaviour/fresh_start.pdf

This is the report of a commission which was set up in response to concerns that large sums of money were being wasted in England and Wales because of insufficient investment on preventive measures and constructive sanctions for antisocial and criminal behaviour. It points out that the young people who commit crime are often also the victims of crime, especially assault and theft. It sets out three key principles for dealing with youth crime: prevention (addressing young people's welfare, health and, educational needs), restoration (holding young people accountable for their actions, and expecting them to accept responsibility for their actions and offer redress or reparation to their victims), and integration (aiming to reintegrate offenders into mainstream society and using imprisonment only as a last resort) as well as an additional principle that prevention measures and sanctions should do no harm. The Chapter on prevention provides examples of effective preventive services for families, schools and communities that have been evaluated through rigorous studies in Australia, Britain, Canada, the US and Scandinavia. More detail is contained in the companion publication to this report:

The Independent Commission on Youth Crime and Antisocial Behaviour. 2010. **Time for a new hearing**. London: The Police Foundation. http://www.police-foundation.org.uk/uploads/catalogerfiles/time-for-a-new-hearing/new_hearing.pdf

This report draws on the international evidence and proposes that a form of youth justice known as restorative youth conferencing should be introduced in England and Wales. Chapter Two outlines the existing court-based systems in England and Wales and Chapter Three examines 16 alternative forms of hearing from the UK and other countries. Chapter Four identifies four basic structural models from the international experience and states that restorative youth conferencing is the most promising of them. Chapter Five gives a final recommendation and discusses implementation issues. A detailed analysis of the 16 community panel, tribunal and court systems summarised in Chapter Three, including New Zealand's family group conferencing, can be found in Annex A which can be downloaded from this website: <http://www.police-foundation.org.uk/publications/other-publications/time-for-a-new-hearing> .

Dahlberg LL, Toal SB, Swahn MH, et al. 2005. **Measuring Violence-Related Attitudes, Behaviors, and Influences Among Youths: A Compendium of Assessment Tools Second Edition**. Atlanta, GA: Division of Violence Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. http://www.cdc.gov/violenceprevention/pdf/yv_compendium.pdf

This compendium is intended to provide researchers and violence prevention specialists with a set of tools to assess violence-related beliefs, behaviours, and influences, as well as to evaluate programs to prevent youth violence.

Thornton TN, Craft CA, Dahlberg LL, et al. 2002. **Best practices of youth violence prevention: A sourcebook for community action (Rev. ed.)**. Atlanta, GA: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. http://www.cdc.gov/violenceprevention/pub/yv_bestpractices.html

This sourcebook was developed for individuals working to prevent youth violence and for individuals whose positions make them likely to play a role in violence prevention efforts, including those working in education, health and social services. It is based on an extensive review of the scientific literature and consultations with teachers, school administrators, members of community-based organizations, employees and volunteers at social service agencies, health department personnel, programme planners and practitioners, and researchers from universities. Chapter One covers general principles of intervention planning, implementation and evaluation. Chapter Two provides an in-depth discussion of the best practices of four key youth prevention strategies: Parent- and Family-based Strategy, Home Visiting Strategy, Social-Cognitive Strategy and Mentoring Strategy. The research evidence, where it was available, is included in the discussion, but, because of the limitations of the evidence base, the majority of the best practices presented are based on the collective experience of the intervention practitioners and evaluators.

U.S. Department of Health and Human Services. 2001. **Youth violence: A report of the Surgeon General**. Rockville, MD: US Department of Health and Human Services. <http://www.ncbi.nlm.nih.gov/books/NBK44298/>

This comprehensive report takes a public health perspective to summarise the research on the magnitude, causes and prevention of youth violence. Chapter five deals with the prevention of youth violence and draws mainly on seven reviews of youth violence prevention and intervention programmes, published from 1995 to 2000.

Websites

Centers for Disease Control and Prevention. **STRYVE Striving to Reduce Youth Violence Everywhere**. <http://vetoviolence.cdc.gov/stryve/> accessed October 2014.

STRYVE is an initiative led by the US CDC which takes a public health approach to preventing youth violence. Their web site has an on-line training section and a variety of resources related to youth violence prevention.

Center for the Study and Prevention of Violence, University of Colorado at Boulder. 2014. **Blueprints for Healthy Youth Development**. <http://www.blueprintsprograms.com/> accessed October 2014.

Blueprints is project which identifies prevention and intervention programmes that meet strict scientific standards of programme effectiveness. This site has a programme selector (go to the program search page) which can be used to find programmes addressing various problem behaviours, including anti-social aggressive behaviour and violence. Using the selector will produce a table summarising programmes meeting the search criteria, rating their effectiveness as either Model or Promising, providing information on benefits and costs and identifying the areas of impact. The table contains links for each programme's information (including the relevant research literature), target population, funding strategies and benefits and costs.

Note: The publications listed were identified using the search methodology outlined in **Appendix 1**

CHILD YOUTH AND FAMILY NOTIFICATIONS

Introduction

Child, Youth and Family (CYF) is a service of the Ministry of Social Development. Its roles include promoting the wellbeing of children, young people and their families and the prevention of child abuse and neglect [393]. The Children, Young Persons, and Their Families Act 1989 states that: "Any person who believes that any child or young person has been, or is likely to be, harmed (whether physically, emotionally, or sexually), ill-treated, abused, neglected, or deprived may report the matter to a social worker or a constable", and that any social worker or constable receiving such a report shall ensure that it is investigated [394]. Child, Youth and Family social workers are legally bound to follow up all concerns about children's welfare that are notified to them. The greatest number of referrals to CYF come from the Police, followed by health and education professionals, social service providers, family members and friends, and members of the public [395]. In serious cases of child abuse, CYF works with the Police. In these cases the primary roles of CYF are to assess the safety and wellbeing of children and provide care and protection when this is required. The primary roles of the Police are to address the immediate safety of children and to investigate and hold to account the perpetrators [396].

Over the recent years there has been a very substantial increase in the reported number of notifications to CYF. Notifications increased from 71,927 in the year ending June 2006/07 to 153,407 in 2012/13 [397]. This was at least partly due to a new policy introduced in 2006 requiring Police to notify CYF of all instances of family violence where children were present but it probably also reflects increased public awareness of the need to protect children and increased willingness of people to contact CYFs when they have concerns [398,399]. While the total number of notifications has increased there has also been an increase in the proportion of notifications that are deemed not to require further action [399]. Staff in CYF have to make difficult decisions regarding what action to take when they receive a notification of suspected child harm and there is an inevitable trade-off between managing limited resources, and avoiding stigmatising families, by taking no further action in cases perceived to be low risk and the possibility of missing cases where serious harm is occurring [400].

The following section reviews the number of care and protection notifications received by Child Youth and Family offices for children in recent years.

Data Source and Methods

Indicators

1. Number of care and protection notifications received by Child, Youth and Family
2. Proportion of care and protection notifications where further assessment was required
3. Assessment outcome for children and young people notified to Child, Youth and Family

Data Source

Care and protection notifications received by Child, Youth and Family

Notes on Interpretation

Note 1: The number of notifications and the number requiring further assessment do not represent the number of distinct clients, as some clients have multiple notifications and assessments during any given year. Similarly, the number of assessments does not represent the number of client assessments, as some clients have multiple assessment records during a given year. In addition, as some clients have more than one type of finding during an assessment, they may appear across several categories depending on the type of finding.

Finally the number of assessment findings in a year does not directly relate to the number of notifications or assessments in a year, as there is a time lag between the need for an assessment being identified and the assessment being completed. As a consequence, the figures presented in this section may overestimate the number of children referred to CYF, or the total number found to have experienced abuse in any given year. For similar reasons, no rate data have been provided in this section.

Note 2: The numbers in this section may differ from those presented in previous NZYES Reports as Child, Youth and Family no longer include the intakes received under court order in routine reporting (S19 of the Children, Young Persons, and Their Families Act 1989 and s132 of the Care of Children Act 2004) as they are not considered to be care and protection notifications.



Note 3: Since July 2010, Police family violence referrals that require no assessment by Child, Youth and Family have been received separately in the CYF database. However in this section, they have been included in the main analysis in order to preserve continuity with previous years.

Note 4: CYF notification data do not include any information on the ethnicity of individual children and young people, although this information is available for those requiring further assessment. In this section, ethnicity data are presented only for those for whom further assessment was required.

New Zealand Distribution and Trends

Number of Notifications and Proportion Requiring Further Assessment

In New Zealand during 2013, a total of 148,659 care and protection notifications were received by CYF offices, with 41.6% being thought to require further assessment. These figures reflect a progressive increase in notifications since 2004 when 40,939 were received, however, the proportion requiring further assessment declined from the 86.3% requiring further assessment in 2004. The absolute number of notifications requiring further assessment, however, continued to increase, from 35,350 in 2004 to 61,877 in 2013, an increase of 75.0% over this period (**Table 92, Figure 195**).

Notifications Requiring Further Assessment by Ethnicity

In New Zealand during 2004–2013, the number of care and protection notifications received by CYF that required further assessment increased for children and young people of all ethnic groups (**Table 93**). During the 2013 financial year, 46.3% of notifications requiring further assessment were for Māori children and young people, while 29.0% were for European, 11.3% were for Pacific, and 2.1% were for Asian children and young people (**Figure 196**).

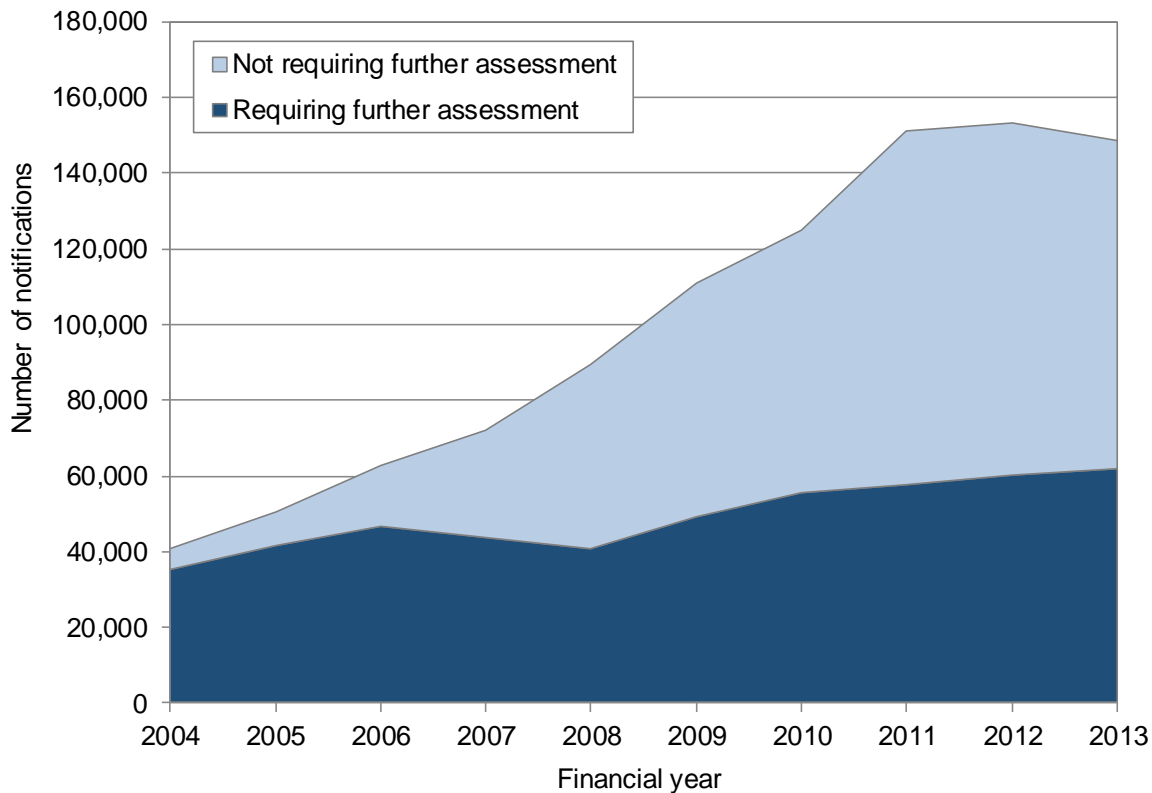
Table 92. Number of notifications received by Child Youth and Family offices, New Zealand 2004–2013 financial years

	Total number of notifications	Number requiring further assessment	% notifications requiring further assessment
New Zealand			
2004	40,939	35,350	86.3
2005	50,488	41,599	82.4
2006	62,739	46,541	74.2
2007	71,927	43,845	61.0
2008	89,461	40,739	45.5
2009	110,797	49,224	44.4
2010	124,921	55,494	44.4
2011	151,109	57,783	38.2
2012	153,407	60,330	39.3
2013	148,659	61,877	41.6

Source: Child Youth and Family



Figure 195. Number of notifications received by Child Youth and Family offices by outcome, New Zealand 2004–2013 financial years



Source: Child Youth and Family

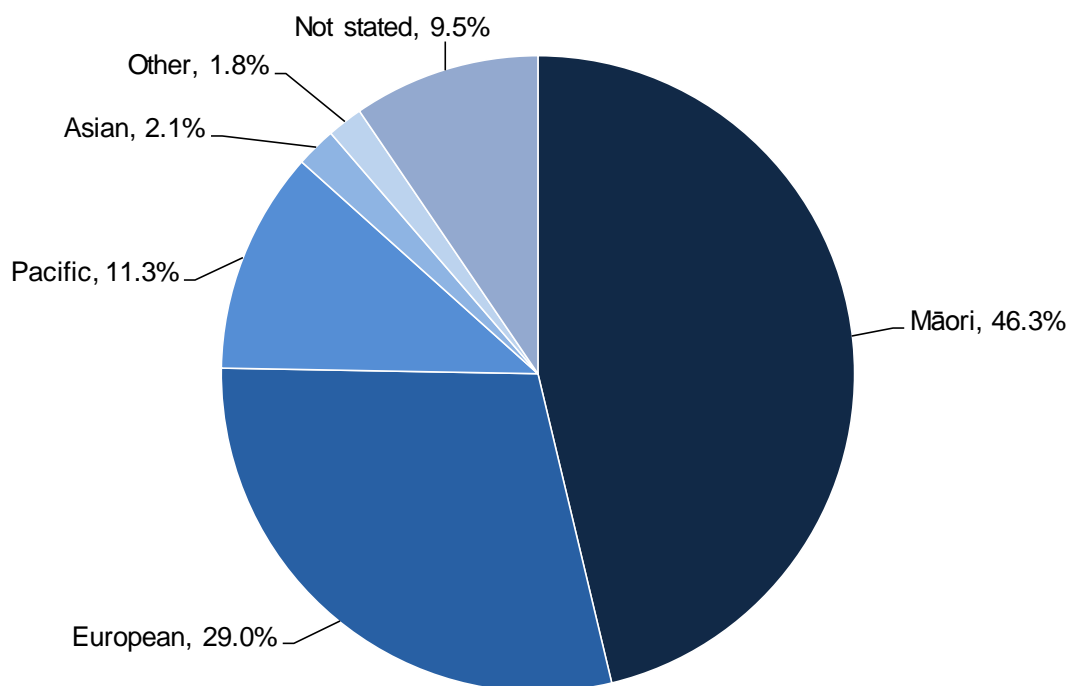
Table 93. Number of notifications to Child, Youth and Family requiring further assessment by ethnicity, New Zealand 2004–2013 financial years

Year	Number of notifications requiring further assessment						
	New Zealand						
	Māori	Pacific	Asian	European	Other	Not stated	Total
2004	12,001	3,092	572	13,318	629	5,738	35,350
2005	15,456	3,767	763	14,186	712	6,715	41,599
2006	17,730	4,964	877	14,676	810	7,484	46,541
2007	18,791	4,927	901	13,707	750	4,769	43,845
2008	18,438	5,016	835	14,201	662	1,587	40,739
2009	23,220	5,857	1,008	15,963	709	2,467	49,224
2010	25,676	6,912	1,100	18,103	682	3,021	55,494
2011	26,527	6,623	1,097	18,610	869	4,057	57,783
2012	27,352	6,435	1,184	19,197	988	5,174	60,330
2013	28,620	7,002	1,269	17,962	1,126	5,898	61,877

Source: Child Youth and Family



Figure 196. Proportion of notifications to Child, Youth and Family requiring further assessment by ethnicity, New Zealand 2013 financial year (n=61,877)



Source: Child Youth and Family

Source of CYF Care and Protection Notifications

In New Zealand during 2004, family members and the Police were the most frequent sources of CYF care and protection notifications, followed by the education and health sectors. While the number of notifications received from all referral sources rose during 2004–2013, the largest increases were seen for Police family violence referrals. By 2013, Police family violence referrals were the most frequent source of CYF notifications, followed by other referral types from Police and the health sector. However, the proportion of Police family violence referrals that required further assessment declined, from 70.5% in 2004 to 11.1% in 2013. While similar trends were seen for other referral sources, the magnitude of these declines was much less marked (**Table 94**).



Table 94. Number of notifications to Child, Youth and Family and proportion requiring further assessment by referrer, New Zealand 2004–2013 financial years

New Zealand									
Number of notifications									
Year	Police Family Violence	Family	Police	Health	Education	Court	Others	Unknown	Total
2004	3,389	7,192	7,311	4,739	4,888	685	12,721	14	40,939
2005	9,238	7,576	7,645	5,417	5,586	744	14,271	11	50,488
2006	19,535	7,252	8,189	5,980	5,733	772	15,265	13	62,739
2007	26,609	7,286	8,720	6,711	5,775	897	15,904	25	71,927
2008	35,445	8,360	12,737	7,851	6,845	909	17,294	20	89,461
2009	51,135	9,019	14,430	8,636	7,345	678	19,542	12	110,797
2010	57,472	9,814	17,779	9,955	7,832	838	21,214	17	124,921
2011	82,408	10,399	14,986	11,031	8,121	805	23,232	127	151,109
2012	78,960	10,285	16,701	12,521	9,487	615	24,701	137	153,407
2013	70,542	10,472	19,092	12,763	9,578	569	25,503	140	148,659
Number requiring further assessment									
2004	2,389	6,086	6,125	4,230	4,550	629	11,329	12	35,350
2005	6,367	6,313	6,105	4,752	5,055	679	12,319	9	41,599
2006	10,605	5,953	6,196	5,205	5,121	714	12,736	11	46,541
2007	10,872	5,093	5,668	5,113	4,608	790	11,685	16	43,845
2008	8,994	4,663	5,747	4,928	4,947	777	10,672	11	40,739
2009	12,280	5,358	6,601	5,838	5,525	583	13,031	8	49,224
2010	12,781	5,947	9,162	6,656	5,867	744	14,326	11	55,494
2011	12,648	5,974	10,215	6,913	6,056	688	15,222	67	57,783
2012	9,703	6,301	11,611	8,106	7,149	513	16,859	88	60,330
2013	7,829	6,463	13,476	8,648	7,411	501	17,459	90	61,877
Percent requiring further assessment									
2004	70.5	84.6	83.8	89.3	93.1	91.8	89.1	85.7	86.3
2005	68.9	83.3	79.9	87.7	90.5	91.3	86.3	81.8	82.4
2006	54.3	82.1	75.7	87.0	89.3	92.5	83.4	84.6	74.2
2007	40.9	69.9	65.0	76.2	79.8	88.1	73.5	64.0	61.0
2008	25.4	55.8	45.1	62.8	72.3	85.5	61.7	55.0	45.5
2009	24.0	59.4	45.7	67.6	75.2	86.0	66.7	66.7	44.4
2010	22.2	60.6	51.5	66.9	74.9	88.8	67.5	64.7	44.4
2011	15.3	57.4	68.2	62.7	74.6	85.5	65.5	52.8	38.2
2012	12.3	61.3	69.5	64.7	75.4	83.4	68.3	64.2	39.3
2013	11.1	61.7	70.6	67.8	77.4	88.0	68.5	64.3	41.6

Source: Child Youth and Family



Assessment Findings for Cases Requiring Further Investigation

Of those notifications which were assessed further during 2004–2013, a large proportion resulted in no abuse being found. Where abuse was found, however, physical and emotional abuse, and neglect were prominent. Behavioural and relationship difficulties were the most frequent non-abuse findings (**Table 95**). Because of the nature of the reporting system, however, and the fact that a single child may appear in a number of categories, it is difficult to determine what proportion of cases related predominantly to a particular type of abuse (e.g. physical, emotional, sexual).

In interpreting these figures, it must also be remembered that a single child may have been the subject of multiple notifications and that there were also significant changes to the notification system during this period.

Table 95. Assessment outcome for children and young people notified to Child Youth and Family, New Zealand 2004–2013 financial years

Year	Abuse				Non-Abuse		Abuse not found
	Emotional abuse	Physical abuse	Sexual abuse	Neglect	Behavioural/relationship difficulties	Self-harm/suicidal	
New Zealand							
2004	2,571	1,864	1,149	2,878	3,325	100	15,860
2005	4,592	2,351	1,424	4,074	4,355	173	23,388
2006	6,142	2,336	1,291	4,199	4,657	172	26,011
2007	8,256	2,274	1,194	4,486	4,461	138	22,921
2008	8,664	2,321	1,003	4,302	4,154	116	19,334
2009	10,938	2,855	1,126	4,677	4,256	106	25,486
2010	12,535	2,886	1,201	4,403	5,007	137	29,313
2011	12,711	3,253	1,514	4,813	4,958	148	30,607
2012	12,454	3,330	1,418	4,970	4,970	156	32,593
2013	12,777	3,343	1,459	5,405	5,025	204	33,845

Source: Child, Youth and Family

Northern DHBs Distribution and Trends

Number of Notifications and Proportion Requiring Further Assessment

During 2004–2013 a large number of notifications were received by CYF offices in the Northern DHBs' catchments. In general, the number of notifications received by these offices increased during this period, while the proportion requiring further assessment declined (**Table 96–Table 98**).



Table 96. Number of notifications received by Child Youth and Family Offices in the Northland and Waitemata DHBs 2004–2013

Year	Notifications		Requiring further assessment		Notifications		Requiring further assessment	
	Number	Number	%	Number	Number	%		
	Northland							
Dargaville				Kaikohe				
2004	151	131	86.8	414	306	73.9		
2005	286	267	93.4	448	349	77.9		
2006	328	287	87.5	446	363	81.4		
2007	334	297	88.9	519	456	87.9		
2008	393	329	83.7	887	503	56.7		
2009	449	398	88.6	1,422	760	53.4		
2010	560	369	65.9	1,610	658	40.9		
2011	671	379	56.5	1,751	629	35.9		
2012	771	469	60.8	1,942	743	38.3		
2013	808	472	58.4	2,137	858	40.1		
Kaitiaki				Whangarei ¹				
2004	318	302	95.0	1,389	1,207	86.9		
2005	381	375	98.4	1,629	1,388	85.2		
2006	352	327	92.9	1,591	1,404	88.2		
2007	509	443	87.0	1,407	1,179	83.8		
2008	533	328	61.5	1,743	1,380	79.2		
2009	851	443	52.1	2,162	1,331	61.6		
2010	1,080	400	37.0	2,809	1,478	52.6		
2011	1,216	553	45.5	2,661	1,629	61.2		
2012	1,619	692	42.7	2,784	1,928	69.3		
2013	1,798	781	43.4	3,479	2,176	62.5		
Waitemata								
Takapuna ²				Waitakere				
2004	1,556	1392	89.5	2,615	2,265	86.6		
2005	1,998	1793	89.7	3,173	2,569	81.0		
2006	2,979	2303	77.3	3,763	2,720	72.3		
2007	3,605	2434	67.5	2,309	1,551	67.2		
2008	3,127	1923	61.5	2,257	1,331	59.0		
2009	2,178	1077	49.4	2,565	1,302	50.8		
2010	2,372	1024	43.2	3,384	1,474	43.6		
2011	3,883	1129	29.1	3,610	1,339	37.1		
2012	3,574	1,381	38.6	3,376	1309	38.8		
2013	3,593	1,421	39.5	2,816	1204	42.8		
Orewa				Westgate ³				
2006				223	217	97.3		
2007				2,326	1,689	72.6		
2008	15	15	100.0	2,413	1,477	61.2		
2009	737	538	73.0	2,837	1,724	60.8		
2010	1,744	763	43.8	3,448	1,852	53.7		
2011	1,695	791	46.7	3,534	1,778	50.3		
2012	1,630	892	54.7	3,688	1,588	43.1		
2013	1,513	767	50.7	3,963	1,483	37.4		

Source: Child Youth and Family



Table 97. Number of notifications received by Child Youth and Family Offices in the Auckland DHB 2004–2013

Year	Notifications		Requiring further assessment		Notifications		Requiring further assessment		
	Number	Number	%	Number	Number	%			
	Auckland DHB								
	Grey Lynn ¹			Onehunga					
2004	995	875	87.9	1,532	1305	85.2			
2005	1,225	1,035	84.5	1,944	1732	89.1			
2006	1,252	1,109	88.6	2,468	1944	78.8			
2007	1,501	1,235	82.3	2,381	896	37.6			
2008	1,614	1,232	76.3	2,018	636	31.5			
2009	2,647	1,101	41.6	2,001	903	45.1			
2010	3,740	1,272	34.0	1,612	902	56.0			
2011	4,072	1,107	27.2	1,603	661	41.2			
2012	5,192	1,053	20.3	1,861	859	46.2			
2013	4,126	1,445	35.0	1,777	901	50.7			
	Otahuhu ²			Panmure					
2004	1,495	1,367	91.4						
2005	1,882	1,712	91.0						
2006	4,018	2,870	71.4						
2007	4,010	2,832	70.6						
2008	4,007	2,215	55.3						
2009	2,815	1,207	42.9	1,565	990	63.3			
2010	3,037	1,291	42.5	3,465	1,138	32.8			
2011	2,690	1,301	48.4	3,482	1,159	33.3			
2012	3,634	1,348	37.1	2,826	1,043	36.9			
2013	3,125	1,371	43.9	2,500	1,359	54.4			

Source: Child Youth and Family



Table 98. Number of notifications received by Child Youth and Family Offices in Counties Manukau 2004–2013

Year	Notifications		Requiring further assessment		Notifications		Requiring further assessment	
	Number	Number	%	Number	Number	%		
	Counties Manukau							
	Clendon			Mangere				
2008	148	145	98.0	92	81	88.0		
2009	2,398	1,171	48.8	3,819	1,138	29.8		
2010	3,050	1,406	46.1	3,476	1,574	45.3		
2011	2,918	1,527	52.3	3,925	1,538	39.2		
2012	3,002	1,313	43.7	5,121	1,662	32.5		
2013	2,982	1,676	56.2	4,822	1,571	32.6		
	Manurewa ³			Otago ⁴				
2004	1,462	1,348	92.2	824	769	93.3		
2005	2,030	1,831	90.2	890	760	85.4		
2006	4,141	3,209	77.5	1,383	1,195	86.4		
2007	4,654	3,021	64.9	2,989	1,529	51.2		
2008	5,608	2,331	41.6	3,788	1,494	39.4		
2009	4,409	1,925	43.7	4,661	1,464	31.4		
2010	4,432	2,012	45.4	4,703	1,664	35.4		
2011	6,026	1,678	27.8	4,562	1,615	35.4		
2012	5,126	2,345	45.7	2,831	1,628	57.5		
2013	4,632	2,096	45.3	3,959	2,230	56.3		
	Papakura ⁵			Pukekohe				
2004	1,185	1,112	93.8					
2005	1,478	1,372	92.8					
2006	1,880	1,732	92.1					
2007	3,185	2,231	70.0					
2008	4,595	1,773	38.6	35	33	94.3		
2009	3,840	1,393	36.3	1,334	598	44.8		
2010	2,676	1,543	57.7	1,861	850	45.7		
2011	4,221	2,213	52.4	2,456	845	34.4		
2012	3,828	1,509	39.4	2,474	1,027	41.5		
2013	3,116	1,638	52.6	2,413	1,055	43.7		

Source: Child Youth and Family

Assessment Findings for Cases Requiring Further Investigation

Of the notifications received by CYF Offices in the Northern DHBs' catchments during 2004–2012 that were investigated further, a large proportion resulted in no abuse being found. Where abuse was found, physical and emotional abuse, and neglect were prominent. Behavioural and relationship difficulties were the most common non-abuse finding (**Table 99**). Because of the nature of the reporting system, however, and the fact that a single child may appear in a number of categories, it is difficult to determine what proportion of cases related predominantly to a particular type of abuse.



Table 99. Assessment outcome for children notified to Child Youth and Family offices in Northland and the Waitemata DHB 2004–2012 financial years

Year	Abuse				Non-abuse		Abuse not found
	Emotional abuse	Physical abuse	Sexual abuse	Neglect	Behavioural/relationship difficulties	Self-harm/suicidal	
Northland							
2004	51	68	36	107	156	4	727
2005	127	110	71	215	303	9	1,535
2006	174	100	73	220	210	6	1,449
2007	221	121	80	283	357	5	1,507
2008	341	114	79	221	372	8	1,501
2009	558	158	91	210	250	6	1,667
2010	735	168	82	240	230	8	1,555
2011	743	194	85	316	220	3	1,801
2012	958	203	91	299	293	8	1,770
2013	909	218	97	339	302	28	2,663
Waitemata							
2004	305	188	132	279	310	7	1,401
2005	741	207	157	327	399	14	2,032
2006	1,041	307	133	395	400	22	2,256
2007	1,780	312	162	408	471	21	2,639
2008	1,645	266	153	414	417	10	2,016
2009	1,649	373	133	393	375	12	1,988
2010	1,541	261	132	406	420	11	2,489
2011	1,511	352	159	485	391	17	2,329
2012	1,409	355	149	375	407	13	2,595
2013	1,096	280	148	465	381	20	2,628

Source: Child Youth and Family



Table 100. Assessment outcome for children notified to Child Youth and Family offices in the Auckland and Counties Manukau DHBs 2004–2012 financial years

Year	Abuse				Non-abuse		
	Emotional abuse	Physical abuse	Sexual abuse	Neglect	Behavioural/relationship difficulties	Self-harm/suicidal	Abuse not found
Auckland DHB							
2004	236	250	113	244	273	17	1,642
2005	560	379	169	430	339	22	2,475
2006	851	383	140	535	329	14	3,083
2007	1,326	330	131	537	272	18	2,152
2008	1,249	327	117	322	231	11	1,906
2009	806	241	106	319	301	10	2,459
2010	923	277	82	304	263	15	2,380
2011	1,049	282	99	281	263	16	2,420
2012	1,026	277	85	337	198	11	2,438
2013	1,009	285	116	376	282	23	2,815
Counties Manukau							
2004	153	214	143	264	363	14	1,288
2005	374	334	170	491	447	13	2,344
2006	774	319	187	482	494	16	3,423
2007	1,327	303	122	622	474	8	3,542
2008	1,510	315	138	579	571	7	2,569
2009	2,306	492	154	622	500	17	3,508
2010	2,540	463	182	715	614	29	4,195
2011	2,442	533	214	804	577	45	4,650
2012	2,564	632	198	885	639	38	4,551
2013	3,039	604	219	1,113	616	34	4,286

Source: Child Youth and Family

Local Policy Documents and Evidence-Based Reviews Relevant to Child Abuse and Family Violence

There are many New Zealand publications dealing with child abuse and family violence, and also a large number of international reviews which have explored this issue in detail. **Table 87** on page 394 considers covers publications which focus primarily on child abuse and neglect, while **Table 104** on page 430 covers publications which focus on other forms of family violence.



FAMILY VIOLENCE

Introduction

Te Rito, the New Zealand Family Violence Prevention Strategy, defines family violence as: *“a broad range of controlling behaviours commonly of a physical, sexual and/or psychological nature, which typically involve fear, intimidation and emotional deprivation. It occurs within close interpersonal relationships”* [401].

Family violence is a major problem in New Zealand. New Zealand Police statistics indicate that in 24 out of the 61 recorded homicides in 2011, the perpetrator had a family relationship to the victim [402]. In 2013 the police conducted 95,080 family violence investigations of which 37,880 had at least one offence recorded [403]. The Youth'12 survey of around 8,000 secondary school students in New Zealand identified that in the past year 7% of students had witnessed adults at home hitting or physically hurting each other and 14% had witnessed adults hitting or physically hurting children [359].

Family violence encompasses “intimate partner violence” (IPV) where harm is perpetrated by a current or former partner or spouse. The most severe and lethal forms of family violence are predominantly inflicted by men on women and children [401]. Children are harmed both by directly witnessing IPV and by awareness that their caregiver is being harmed or threatened [404]. Having their mother killed by her partner is devastating for children, who may lose their father as well if he is convicted of homicide [405]. Children exposed to IPV are at increased risk of emotional and behavioural problems including post-traumatic stress disorder, anxiety disorders, externalising behaviour, difficulties in peer relationships, school-related problems and physical health problems [404], although not all children exposed to IPV exhibit adverse effects. Factors promoting resilience in children exposed to IPV include self-esteem, self-efficacy, the availability of a supportive adult/parent, and friendships or other forms of community support [406]. Research indicates that, in a high proportion of families where there is intimate partner violence, children are also victims of violence. Policies and practices, therefore, need to address both of these forms of family violence rather than focussing exclusively on either women or children [407].

The following section reviews the number of family violence investigations occurring during 2012–2013 as documented by the New Zealand Police. In interpreting these figures, it must be remembered that research suggests that police are involved in only around 10% of the family violence incidents occurring in New Zealand each year [408] so these figures need to be viewed as the “tip of the iceberg”. It should also be borne in mind that trends in police statistics may be the result of public awareness campaigns and changes in the way the police recognise and record family violence incidents. Despite this, these figures provide some insights into family violence in New Zealand.

Data Source and Methods

Indicator

1. Number of Police Family Violence Investigations (FVI)

Data Source

New Zealand Police

Definition

The Police record “Family Violence Investigations” (FVI) in their operational database where a given investigation may relate to one or more offences and/or non-offence incidents. Only one of these offences (usually the most severe) is used to categorise the investigation. Recording incidents as FVIs is at the discretion of the Police, hence these statistics only characterise the FVIs Police have chosen to undertake.

Notes on Interpretation

Note 1: Police policy defines family violence as “*violence which is physical, emotional, psychological and sexual and includes intimidation or threats of violence*”. The term “family” includes parents, children, extended family members, whānau, or any other person involved in a relationship (e.g. partners, caregivers, boarders and flatmates). It does not include neighbours.



Note 2: Creating a Family Violence Investigation is an active choice made by the Police. Therefore, no inferences can be made about trends in the prevalence of family violence from these statistics. The decision to undertake an FVI is affected by a number of factors which may change over time. A single FVI might include several incidents that might or might not be related to a criminal offence (i.e. counts of FVIs are not counts of recorded offences).

Note 3: From 1 July 2012 the Police ceased producing data on recorded offences flagged as family violence. Currently Tier-1 statistics (the most important official statistics) are being developed from a new dataset that will include information about victims of crime and the relationship between victim and offender. This is expected to enhance the knowledge of family violence in New Zealand. These are scheduled to become available in late 2014.

Note 4: Because District Health Board boundaries do not match Police area boundaries, the data for some Police areas might be included in figures for more than one District Health Board. New Zealand totals only include each Police Area once so are less than the aggregate total for all District Health Boards. Refer to **Appendix 8** for Police Area boundaries.

Note 5: All of the data in this section were extracted from the Police's dynamic operational database on 27 May 2014. Data in this database are subject to change as new information is continually recorded, and the data-set was still under development. Figures reported on different dates may vary due to this ongoing development, and therefore data in this report should not be compared with data in previous NZCYES reports.

New Zealand Distribution

Family Violence Investigations where Children were Present

In New Zealand, 95,082 FVIs were undertaken by New Zealand Police during 2013. In 62.2% of the investigations, children were reported as being present or usually residing with the victim (**Table 101**).

Table 101. Number and proportion of police family violence investigations where children were present*, New Zealand 2012–2013

Year	Number of FVIs		Percent of FVIs where children were present*
	Children present	Total	
2012	49,954	87,647	57.0
2013	59,144	95,082	62.2

Source: NZ Police; Note: *Children were present or usually residing with the victim

Family Violence Investigations with One or more Offences Recorded

Of the 95,082 Police FVIs conducted in New Zealand during 2013, 39.8% had one or more offences recorded (**Table 102**).

Table 102. Number and proportion of Police family violence investigations where at least one offence was recorded, New Zealand 2012–2013

Year	Number of FVIs		Percent of FVIs where children were present*
	At least one offence recorded	Total	
2012	40,681	87,647	46.4
2013	37,886	95,082	39.8

Source: NZ Police; Note: *Children were present or usually residing with the victim

Northern DHBs Distribution

Family Violence Investigations in the Northern DHBs

During 2012–2013, a large number of FVIs were conducted in the Police areas that overlapped the Northern DHB's catchments (**Table 103**). See **Appendix 8** for a map of the Police Area boundaries.



Table 103. Family Violence Investigations for Police Areas overlapping the Northern DHBs' catchments 2012–2013

Police area	Percent of FVI where children present*	
	2012	2013
Northland DHB		
Northland police district		
Far North	55.4	62.8
Whangarei	58.4	66.0
Waitemata DHB		
Waitemata police district		
North Shore	49.8	55.8
Rodney	53.2	60.8
Waitakere	57.1	62.0
Auckland Motorways	29.6	33.3
Auckland DHB		
Auckland City police district		
Auckland Central Area	35.5	39.3
Auckland East Area	51.9	55.2
Auckland West Area	51.0	54.2
Counties Manukau DHB		
Counties Manukau police district		
Counties Manukau Central	64.7	69.0
Counties Manukau East	59.7	63.9
Counties Manukau South	59.6	64.4
Counties Manukau West	60.0	61.5

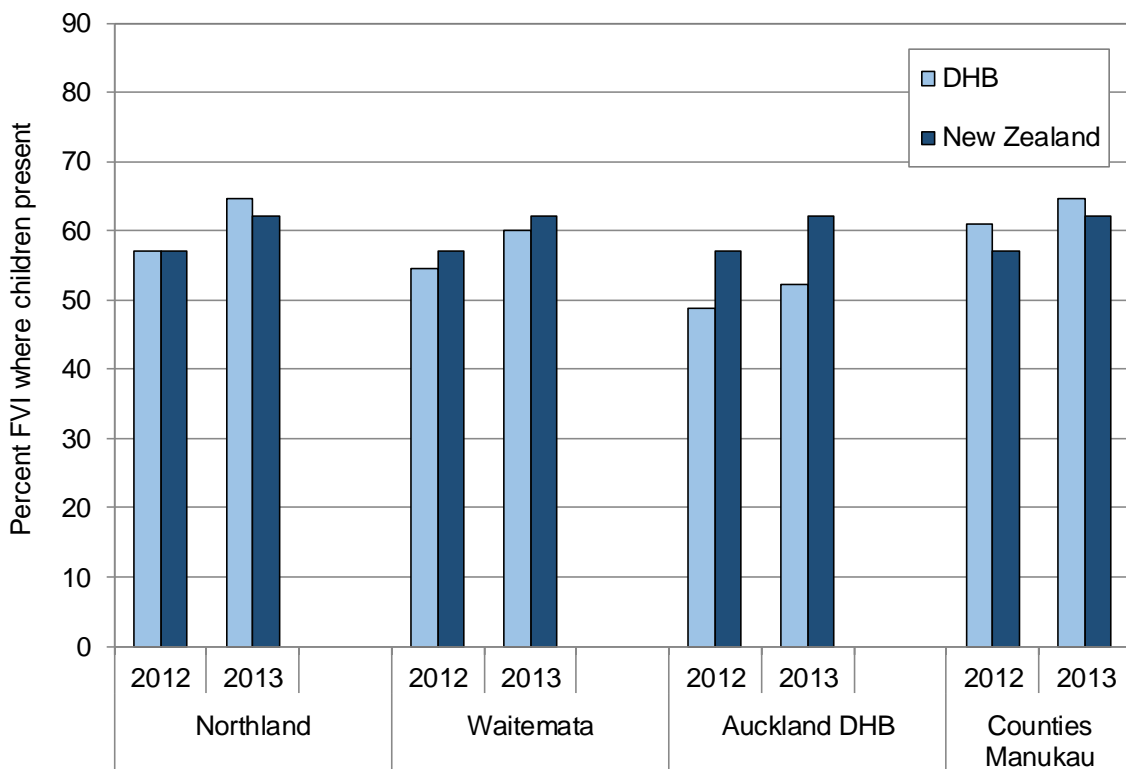
Source: NZ Police; Note: *Children were present or usually residing with the victim

Family Violence Investigations Where Children Were Present

In the Northern DHBs during 2012 and 2013 a high proportion of family violence investigations involved children, with Auckland DHB in 2012 being the only instance where this proportion did not exceed 50%. The equivalent rates for New Zealand were 57.0% in 2012 and 62.2% in 2013 (**Figure 197**).



Figure 197. Percentage of Police family violence investigations with children involved for Police Areas in the Northern DHB's catchment and New Zealand 2012 and 2013



Source: NZ Police

Local Policy Documents and Evidence-based Reviews Relevant to Family Violence

In New Zealand there is a range of publications that address the prevention of child abuse and family violence. A large number of international reviews have also explored this issue. **Table 104** (below) summarises publications and evidence based reviews which address family violence, while **Table 87** on page 394 summarises publications which focus primarily on child abuse and neglect.



Table 104. Local policy documents and evidence-based reviews relevant to family violence

Ministry of Health publications
<p>Jigsaw & Ministry of Health. 2014. Increasing VIP Programmes' Responsiveness to Māori: a whānau-centred approach for the VIP programme. Wellington: Ministry of Health. http://www.health.govt.nz/publication/increasing-violence-intervention-programme-vip-programmes-responsiveness-maori</p> <p>This resource aims to improve the responsiveness of violence intervention programme (VIP) responsiveness to Māori by sharing stories, case studies and 'lessons learned' from VIP programmes that are already working well for Māori. The stories and case studies reflect the experiences of VIP practitioners, health professionals and service providers and they are grouped into five themes: putting whānau at the centre of VIP and health practice: weaving a southern perspective; whānau strengths: seeing the patient in the context of their extended family and community; supporting Māori and their whānau: using tikanga Māori to support healing and recovery; partnerships with Māori and community providers to prevent family violence and connect whānau with support, and embedding whānau-centred approaches into policy and practice.</p>
<p>Ministry of Health. 2003. Recognising and Responding to Partner Abuse: A resource for general practices. Wellington: Ministry of Health. http://www.health.govt.nz/publication/recognising-and-responding-partner-abuse</p> <p>General practice can play an important role in early identification of partner abuse and initiating appropriate help for those who need it. This resource for general practices covers how to ask about partner abuse, provide support, and discuss options. It is intended to be used in conjunction with training covering these areas.</p>
<p>Ministry of Health. 2002. Family Violence Intervention Guidelines Child and Partner Abuse. Wellington: Ministry of Health. http://www.health.govt.nz/publication/family-violence-intervention-guidelines-child-and-partner-abuse</p> <p>These guidelines are aimed at all health care professionals and provide a framework for safe and effective interventions to assist victims of violence and abuse. They are intended for use only by healthcare providers who have received appropriate training on how to enquire about, and respond to, family violence. They contain separate sections on child and partner abuse but recommend that, because of the high co-occurrence of these forms of abuse, a process of dual risk assessment should be followed. Within each section a six-step approach to identifying and responding to victims of abuse is outlined: identify; support and empower; assess risk; safety planning and referral; document; and refer. There are also sections addressing the particular issues of Māori and Pacific families.</p>
<p>Ministry of Health. 2007. An ounce of prevention... VIP violence intervention programme. Wellington: Ministry of Health. http://www.health.govt.nz/publication/ounce-prevention</p> <p>This booklet contains a series of brief stories by a variety of health and health-related professionals concerning their thoughts and experiences in dealing with family violence. It highlights the importance of asking, rather than waiting for people to disclose that they are victims of family violence.</p>
Ministry of Social Development documents
<p style="text-align: center;">Reports from the Taskforce for Action on Violence within Families</p> <p>The Taskforce for Action on Violence within Families (the Taskforce) was established in June 2005 to lead and coordinate interagency action to address family violence, including abuse and neglect of children and older persons. It consists of key decision-makers from the government and non-government sectors, the judiciary and Crown agencies.</p> <p>Taskforce for Action on Violence Within Families. 2006. The First Report. Wellington: Ministry of Social Development. https://www.msd.govt.nz/documents/about-msd-and-our-work/work-programmes/initiatives/action-family-violence/taskforce-report-first-report-action-on-violence.pdf</p> <p>This report sets out the first programme of action of the Taskforce for Action on Violence within Families, under the headings of leadership, changing attitudes and behaviour, ensuring safety and accountability, and effective support services.</p> <p>Taskforce for Action on Violence Within Families. 2007. The Ongoing Programme of Action. Wellington: Ministry of Social Development. https://www.msd.govt.nz/documents/about-msd-and-our-work/work-programmes/initiatives/action-family-violence/taskforce-ongoing-programme-of-action.pdf</p> <p>This second report from the Taskforce presents its achievements to date and sets out its plans and programmes for 2007/08 and beyond, under the same four headings as the first report. The summary of this report can be found here: https://www.msd.govt.nz/documents/about-msd-and-our-work/work-programmes/initiatives/action-family-violence/taskforce-ongoing-programme-of-action-summary.pdf .</p> <p>The 2010/11 programme of action can be found here: https://www.msd.govt.nz/documents/about-msd-and-our-work/work-programmes/initiatives/action-family-violence/programme-of-action-2010-2011.doc .</p> <p>The 2011/12 programme of action can be found here: http://www.msd.govt.nz/documents/about-msd-and-our-work/work-programmes/initiatives/action-family-violence/taskforce-poa-2011-2012.doc</p> <p>The 2012/13 programme of action can be found here: https://www.msd.govt.nz/documents/about-msd-and-our-work/work-programmes/initiatives/action-family-violence/programme-of-action-2012-2013.doc</p> <p>Further reports from the taskforce can be downloaded here: https://www.msd.govt.nz/about-msd-and-our-work/work-programmes/initiatives/action-family-violence/reports.html#TheOngoingProgrammeofAction2 .</p>

Chetwin A. 2013. **A review of the effectiveness of interventions for adult victims and children exposed to family violence.** Wellington: Litmus, for the Ministry of Social Development. <https://www.msd.govt.nz/documents/about-msd-and-our-work/work-programmes/initiatives/action-family-violence/a-review-of-the-effectiveness-of-interventions-for-adult-victims-and-children-exposed-to-family-violence-25-09-2013-tf-meeting.pdf>

This paper, which was produced for the Taskforce for Action on Violence within Families, examines the effectiveness of interventions that respond to intimate partner violence and children exposed to this form of violence. Across the research reviewed, there were several factors common to effective interventions for both victims and children: integrated services provided with multi-agency collaboration; response systems capable of addressing a variety of different needs, at different times and in different locations, and which can work with differences in culture, age, level of trauma and co-occurring issues; offering both victims and children long term, ongoing support; having skilled, experienced and well-supported staff with good understanding of the dynamics of family and other violence, and having strong links to other services which support victims and children. The review authors assessed and summarised the evidence for the effectiveness of integrated response, interventions for victims of intimate partner violence, children exposed to intimate partner violence, and elder abuse, and family-centred interventions.

The Māori Reference Group for the Taskforce for Action on Violence in Families. 2013. **E Tu Whānau Programme of Action for Addressing Family Violence 2013–2018.** Wellington: New Zealand Government. <http://www.familyservices.govt.nz/documents/working-with-us/programmes-services/whanau-ora/e-tu-whanau-programme-of-action-2013-2018.pdf>

This programme of action builds on the work achieved under the first programme of action (2008–13). It provides a framework within which Te Ao Māori and government can continue to work together to address issues related to whānau violence over the five years 2013–2018. In summary, the stated aims of the programme are: to inspire and support whānau, hapū and iwi to take action to address issues of violence, to look to the past for guidance and to have big dreams for now and the future—Te Mana Kaha o te Whānau; provide an action plan that is Māori owned and led, achievable and 'real'—that will result in actions that actually make a difference; to provide clarity and guidance around what is required of government and Te Ao Māori; and to build on the significant achievements and success of all that has gone before.

Paulin J. 2013. **Report on monitoring and evaluation activity in New Zealand across the family violence sector.** Wellington: Artemis Research, for the Ministry of Social Development. <https://www.msd.govt.nz/documents/about-msd-and-our-work/work-programmes/initiatives/action-family-violence/report-on-monitoring-and-evaluation-activity-in-nz-across-the-fv-sector-19-06-2013-tf-meeting.pdf>

This report contributes to Taskforce for Action on Violence within Families Programme of Action 2012/13 by describing current monitoring and evaluation across the family violence sector. The terms of reference for the report were to 'describe current conceptual frameworks; describe current monitoring and evaluation practice; and identify gaps and improvements so that evaluation activities help ensure that services we invest in have the greatest possible impact'. Report sections cover recent monitoring activity, recent evaluation and social research activities, monitoring and evaluation underway or planned, and gaps and improvements.

Thornley L. 2013. **What works to prevent intimate partner violence and elder abuse.** Wellington: Quigley and Watts Ltd., for the Ministry of Social Development. <https://www.msd.govt.nz/documents/about-msd-and-our-work/work-programmes/initiatives/action-family-violence/what-works-to-prevent-intimate-partner-violence-and-elder-abuse-25-09-2013-taskforce-meeting.pdf>

This review draws mostly on existing reviews and literature syntheses. It focuses on five primary prevention approaches: societal-level, community-level, indigenous-led, alcohol-related, and child and youth-focused. It found that all five approaches are thought to have promise, and that there are some evaluations of interventions that have shown reductions in intimate partner and sexual violence. This review excludes family support and parenting programmes. Overall, the evidence base for preventive interventions is limited, as few interventions have been sufficiently evaluated. The literature suggests that programmes which aim only to change knowledge or awareness, and do not attempt to change attitudes, behaviours or social norms, are likely to be ineffective in preventing violence, as are short term media campaigns implemented in isolation without a comprehensive social marketing approach.

At the societal level, examples of interventions which have been evaluated and found to be effective are setting minimum alcohol purchase ages and banning alcohol advertising. Promising societal-level prevention interventions are Australia's Respect, Responsibility and Equality program, restrictions on the sale and supply of alcohol in Aboriginal and Torres Strait Islander communities, the US Coaching Boys into Men media campaign, and New Zealand's It's Not OK campaign. There is emerging evidence for community-level approaches and international researchers consider these to have great potential. Indigenous-led approaches are under-researched. Māori primary prevention programmes included the Ngāti Porou Community Injury Prevention project and the Amokura Family Violence Prevention Strategy. There are interventions to reduce problem drinking that are well-supported by evidence and could be expected to reduce intimate partner violence. There is emerging evidence that general alcohol harm reduction interventions, e.g. reducing alcohol availability, raising the price and improving the safety of drinking venues are effective. Primary prevention interventions with children and youth (often in school or early childhood education settings) are supported some of the strongest evidence in the field of violence against women. The review authors found very little information on the prevention of elder abuse and neglect.

The Expert Advisory Group on Family Violence. 2013. **Report of the Expert Advisory Group on Family Violence.** Wellington: Ministry of Social Development. http://beehive.govt.nz/sites/all/files/Report_of_the_Expert_Advisory_Group_on_Family_Violence.pdf

In 2013, the Associate Minister for Social Development, Tariana Turia, appointed an expert advisory group (EAG) to provide independent strategic advice to assist the Government to determine key priority actions to address family violence in New Zealand. This report contains the EAG's recommendations, which are grouped into three broad areas: structural reform, research/information management, and streamlined service delivery, efficiency and partnerships. Regarding primary prevention, the EAG made two recommendations: an on-going commitment to national education/social marketing campaigns aimed at changing attitudes to family violence (in collaboration with community run projects), and closer coordination between the Ministries of Education, Health and Social Development to lead and/or support prevention initiatives. The EAG noted that there are 12 different government departments with a role in either the prevention or response to family violence: the Ministry of Social Development, the Ministry of Health, the Ministry of Education, the Ministry of Justice, the Accident Compensation Corporation, the Department of Corrections, the New Zealand Police, the Ministry of Business Innovation and Employment, Te Puni Kokiri, the Ministry of Pacific Island Affairs, the Ministry of Women's Affairs, and the Office of Ethnic Affairs.

Close L, Peel K. 2012. **Incorporating the voice of experience: Family violence—service user involvement guide.** Wellington: Ministry of Social Development for the Taskforce for Action on Violence within Families. <https://www.msd.govt.nz/documents/about-msd-and-our-work/work-programmes/initiatives/action-family-violence/voice-of-experience.pdf>

This guide is intended primarily for the people in government and non-government agencies who directly or indirectly provide services for people affected by family violence, but it may also be useful to service users and service user organisations seeking to participate in service development. It focuses on ways to involve family violence service users in service provider organisations, particularly in policy and service development processes. It covers: reasons to involve service users, best practice, barriers to involving service users, ways to involve service users and working with specific populations.

Peteru MC. 2012. **Falevitu: A literature review on culture and family violence in seven Pacific communities in New Zealand.** Wellington: Ministry of Social Development. <https://www.familyservices.govt.nz/documents/working-with-us/programmes-services/pacific-framework-literature-review-fa2.pdf>

This literature review aimed to cover: perceptions of and cultural beliefs on family violence; concepts that promote the wellbeing and 'sacredness' of Pacific people; contemporary influences on families; relationships between culture, religion, social norms and family violence; impacts of family violence; relevant national and international literature on indigenous people and family violence, migration, inequalities and identity; and information gaps and areas for further research and exploration. The review authors found a paucity of both statistical and narrative research literature in the areas of interest and they stated that their review "affirms that there is no literature or critical research that focuses on understanding the conditions under which violence enters the family, and the cultural pathways taken to restore harmony and wellbeing in the family". They outline areas where further research is needed.

Pacific advisory group on family violence. 2012. **Nga vaka o kāiāga tapu: A Pacific conceptual framework to address family violence in New Zealand.** Wellington: Ministry of Social Development. <http://www.ppdvp.org.nz/wp-content/media/2014/04/pacific-framework-fa2.pdf>

This document sets out a conceptual framework to address the high prevalence of violence in families belonging to one or more of seven ethnic Pacific communities in New Zealand. It is intended as a guide for policy-writers and to inform the development of a training programme to assist those working with Pacific families affected by family violence, both ethnic-specific practitioners and others. The framework takes a strengths-based approach and its overall vision is to achieve wellbeing, and strong and vibrant families and individuals, in Cook Islands Māori, Fijian, Nuiean, Sāmoan, Tokelau, Tongan and Tuvaluan communities. It contains seven ethnic-specific frameworks which describe and explain key cultural concepts and principles of each ethnic community that promote family wellbeing, and outline practice imperatives for dealing with family violence in a culturally relevant manner.

Boutros N, Waldvogel J, Stone G, et al. 2011. **Family violence in migrant and refugee families and successful models of prevention and intervention: A summary analysis and annotated bibliography.** Wellington: Ministry of Social Development. <https://www.msd.govt.nz/documents/about-msd-and-our-work/work-programmes/initiatives/action-family-violence/annotated-bibliography-family-violence-in-migrant-and-refugee-communities.doc>

This publication provides a summary of research relating to family violence within refugee and migrant communities both in New Zealand and overseas. It includes information about the prevalence, dynamics, causes, risk and protective factors and the impact of family violence in various ethnic communities. It also discusses the barriers that victims face in seeking help and the challenges for service providers attempting to address victims' needs. Research indicates that migrant and refugee women are more negatively impacted by family violence than mainstream women because they have fewer realistic options to escape from, or change, their situation.

Levine M, Benkert N. 2011. **Case Studies of Community Initiatives Addressing Family Violence in Refugee and Migrant Communities: Final Report.** Wellington: Ministry of Social Development and Ministry of Women's Affairs. <https://www.msd.govt.nz/documents/about-msd-and-our-work/work-programmes/initiatives/action-family-violence/case-studies-report-fv-refugee-and-migrant.doc>

This report presents two case studies of community initiatives addressing family violence in refugee and migrant communities that were perceived by community members and service providers to be working well, and also brief descriptions of six other initiatives. The two case studies involved the Umma Trust, which provides services and support aimed at overcoming isolation, empowering women, and preventing family violence, to Muslim communities in Auckland, and Second Chance, which offers post-refuge education and training to promote independence for survivors of intimate partner violence from Asian, Middle Eastern and African immigrant backgrounds.

Interviews with key informants from central, regional and local government, and from community organisations, consistently indicated that the most effective interventions were those that were well networked with other groups and had deep community ties. This report discusses various types of community initiatives, including service and support providers which address a range of community needs, refuges which are aimed at the immediate safety of victims of family violence, and women's networks that address the isolation that makes women vulnerable. Systemic issues relevant to family violence in migrant communities include isolation, immigration policy requirements, men using their culture, religion and community standing to rationalise their coercive behaviour, and poverty and unemployment. The research identified three broad good practice principles: taking a holistic approach (building trust and good networks, involving men and male community leaders, and dealing with perpetrators as well as victims), empowering the community, and effective engagement with the community.

Point Research Ltd. 2010. **An innovative approach to changing social attitudes around family violence in New Zealand: Key ideas, insights and lessons learnt The Campaign for Action on Family Violence** Wellington: Centre for Social Research and Evaluation, Ministry of Social Development. <http://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/research/campaign-action-violence-research/an-innovative-approach-to-changing-social-attitudes.pdf>

This research aimed to: articulate the key ideas, messages and approach of the "it's not OK" campaign to reduce family violence, to review the evidence on how well the campaign is working, and to highlight the lessons and insights from the campaign that can be used to inform the future development of the campaign and other government-led initiatives. It was based on interviews with 29 key informants/stakeholders and informed by a critical analysis of relevant literature relating to family violence, social change and social movements, policy documents and other research and information related to the campaign. It suggests that ways forward for the campaign could include: a holistic approach for Māori whānau, more diverse voices, talking about help giving and receiving behaviour, and increasing future campaign leverage and sustainability by continuing to build a social movement through community partnerships, social networking and mass media messages.

Other research reports from the Campaign for Action on Family Violence can be found here: <https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/research/campaign-action-violence-research/index.html>

The Pacific Advisory Group for the Taskforce for the Taskforce for Action on Violence within Families. 2009. **Programme of Action for Pacific Peoples 2008 and beyond.** Wellington: Ministry of Social Development. <http://www.familyservices.govt.nz/documents/working-with-us/programmes-services/whanau-ora/programme-of-action-for-pacific-peoples-2008-and-beyond.pdf>

This programme provides a practical framework for addressing key issues and priorities in relation to violence within Pacific families and communities, and it also contains important contextual and background information. The programme has 12 stated objectives. Chapter three sets out the actions required to achieve each of the objectives, the expected outcomes, the lead and collaborating government ministries and/or agencies, and timeframes.

Lievore D, Mayhew P. 2007. **The scale and nature of family violence in New Zealand: A review and evaluation of knowledge.** Wellington: Ministry of Social Development <https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/research/scale-nature-family-violence/>

This report was commissioned from the Crime and Justice Research Centre to support the Taskforce for Action on Violence within Families. It was intended to provide a comprehensive review of what was known about the nature and scale of family violence in New Zealand, and to assess the quality of the evidence. It covers physical, sexual, psychological and financial abuse/violence towards intimate partners, people in dating relationships, children, elderly people and siblings. It is based on a systematic search and review of published and unpublished research conducted in New Zealand, and major international studies. It also includes administrative and service-based data collected by government and non-government agencies, some of which has been reanalysed. Among the conclusions of this report are that, while there is relatively good understanding of the family psychological and demographic risk factors that predict violence, there is little understanding of the ways these factors interact with broader social structures and cultural norms that either support or inhibit violence. There is also a lack of knowledge about resilience in the face of family violence and of the factors promoting healthy outcomes for victims.

Ministry of Social Development. 2002. **Te Rito: New Zealand Family Violence Prevention Strategy**. Wellington: Ministry of Social Development. <http://www.msd.govt.nz/about-msd-and-our-work/publications-resources/planning-strategy/te-rito/index.html>

This strategy sets out the Government's key goals and objectives and a framework for action to maximise progress towards the goal of violence-free families and whānau and implement the family violence prevention plan of action released in September 2001. There are five key goals and a five-year action plan detailing 18 specific, interrelated areas of action.

Ministry of Women's Affairs publications

Ministry of Women's Affairs. 2013. **Current thinking on primary prevention of violence against women**. Wellington: Ministry of Women's Affairs. http://mwa.govt.nz/sites/public_files/Final%20Current%20thinking%20on%20primary%20prevention.pdf

The purpose of this paper is to generate discussion about approaches to primary prevention of violence and how these can be implemented in New Zealand. It focuses largely on violence against women. It states that, internationally, there is widespread agreement across the research, policy and community sectors that violence prevention involves promoting gender equality, and addressing the multiple and intersecting forms of disadvantage and discrimination that place women at risk of violence. The systemic factors that further disadvantage women from minority cultural groups, including Māori, such as racism and poverty, also need to be addressed. It also states that currently few states, if any, have been able to implement and evaluate sustained multi-sectoral measures aimed at changing the attitudes, practices and behaviours that cause and contribute to violence against women and that, as a result, there are currently no effective primary prevention models to draw on. Despite this, there are overseas strategies pointing to promising approaches and best practice guidelines and there is evidence about elements of successful primary prevention approaches, for example the positive impact of respectful relationship programmes delivered to young people.

Ministry of Women's Affairs. 2012. **Speak up, Seek Help, Safe Home: A review of literature of culturally appropriate interventions for intimate partner violence in ethnic communities**. Wellington: Ministry of Women's Affairs. http://mwa.govt.nz/sites/public_files/speak-up-see-help-safe-home.pdf

There is little data on the prevalence of intimate partner violence in ethnic communities in New Zealand but Asians, predominantly overseas-born, were significantly over-represented as victims and perpetrators of couple-related homicides in 2002–2006 (although the overall figures are small and should be interpreted with caution). This literature review found that research on interventions for domestic violence in ethnic communities in New Zealand was scarce, therefore the majority of the research reviewed was conducted in the US, Canada and Australia. The reviewers gave priority to research on ethnic groups that are significantly represented in New Zealand. Most research involved surveying the experiences of community members, clients and workers, and soliciting their suggestions. Only two papers reported on evaluations of interventions, one in Perth and one in New South Wales. In both of these projects, participants were surveyed and both projects reported positive feedback concerning factors such as awareness of violence issues, willingness to talk about violence, knowledge of services, and willingness to access services. The review authors stated that further research is needed, particularly in the areas of evaluation and working with offenders in culturally appropriate ways.

Ministry of Justice publications

Carswell S. 2006. **Family violence and the pro-arrest policy: a literature review**. Wellington: Ministry of Justice. <http://www.justice.govt.nz/publications/global-publications/f/family-violence-and-the-pro-arrest-policy-a-literature-review-december-2006>

Since 1987, the New Zealand Police have had a pro-arrest response at domestic violence incidents. Officers have been instructed to arrest offenders where there is sufficient evidence and that the victim does not have to make an official complaint. Several studies from the US produced findings that suggest that the pro-arrest response may actually increase violence among various sub-groups in society, such as the unemployed and minority ethnic communities. Another concern is that the directive nature of the pro-arrest response has an impact on victims by taking the choice of pressing charges away from them. This review examines the validity of these concerns. It outlines the key issues and research findings from both international and New Zealand studies on pro-arrest policies. It begins by describing the historical development of family violence policy in New Zealand before discussing the most influential pro-arrest studies, the Minneapolis study and the Spousal Abuse Replication Project (SARP). While the original findings from the SARP studies suggested that arrest may actually increase the risk of violence in some groups of offenders, more recent analysis of the SARP studies by Maxwell, Garner and Faigan indicated a significant, although modest, reduction in re-offending across all five study sites. The literature on victim choice indicated that there are diverse types of family violence and no consensus among victims as to what their preferred police response would be. While most wanted the violence to stop and the offender to be removed, only half wanted the offender arrested (although fear of retaliation was a major reason for this, and is what the pro-arrest response is intended to overcome). Despite pro-arrest policies, in practice police do use their discretion, and sometimes take account of the victim's wishes. In a brief review of alternative models, it was found that the pro-arrest police response is a central tenet of family violence approaches internationally and that differences between models arise from the variety of strategies used in conjunction with the pro-arrest response.

Te Puni Kōkiri publications

Te Puni Kōkiri. 2010. **Arotake Tūkinu Whānau: Literature review on family violence.** Wellington: Te Puni Kōkiri. <http://www.tpk.govt.nz/en/in-print/our-publications/fact-sheets/safer-whanau/download/tpk-family-violence-literature-review.pdf>

This literature review forms part of the Family Violence Māori Research Agenda project led by Te Puni Kōkiri. The review affirms that there little research on uniquely Māori approaches to reducing family violence. The sections in the review are entitled: contextualising family violence for Māori traditional views of family violence for Māori, colonisation: undermining traditional knowledge and practices, transforming realities with traditional knowledge, defining family violence for Māori, Māori models, and discussion. The section on Māori models provides an overview of several kaupapa Māori based programmes, outlining key elements, values and concepts that underpinned the programmes' development. In the discussion section the review authors noted that the concept of collective responsibility through whakapapa and whānaungatanga is continually raised by Māori working in the area of family violence and they stated that this is clearly a priority area for further research.

Department of Corrections publications

Slabber M. 2012. **Community-based Domestic Violence Interventions: A literature review—2012.** Wellington: Department of Corrections.

http://www.corrections.govt.nz/_data/assets/pdf_file/0005/673025/COR_Community_Based_Domestic_Violence_Interventions_WEB_2.pdf

This publication provides an overview of the status of domestic violence interventions in Canada, the UK, Australia, the US and New Zealand. It explains that there are two approaches that dominate the domestic violence field: The Domestic Abuse Intervention Project Programme (DAIP or the Duluth Programme), which based on a feminist psycho-educational model and views domestic violence as the result of socio-political forces influenced by patriarchal philosophy, and involves teaching clients about power and control, and how to develop relationships based on respect, equality and non-violence, and cognitive behavioural (CB) approaches which assume that violence is a learned behaviour that can be replaced through the use of cognitive, emotional and behavioural analyses and skills training techniques. The author found that there have been few evaluation studies, and assessments of Duluth-type and CB programmes show few or no significant differences between them with programmes having, at best, a weak positive impact on recidivism rates. She also stated that, overall, there is more evidence on what doesn't work than on what does, but that findings from research on other interventions with general offenders suggest that the most effective interventions are those consistent with the principles of risk, needs and responsibility.

New Zealand guidelines

Ministry of Social Development. 2014. **Family violence intervention: Service guidelines version three: June 2014.** Wellington: Ministry of Social Development. <http://www.msd.govt.nz/documents/about-msd-and-our-work/publications-resources/service-guidelines/family-violence-intervention-service-guidelines.pdf>

These guidelines are intended for use by providers contracted to the Ministry of Social Development to deliver family violence intervention services. They cover relationships between the Ministry, the provider and the client, the nature of the services, the activities and clients of services, service delivery, and measuring and reporting results.

International guidelines

National Institute for Health and Care Excellence. 2014. **Domestic violence and abuse: how health services, social care and the organisations they work with can respond effectively.** London: National Institute for Health and Care Excellence. <http://www.nice.org.uk/guidance/ph50/resources/guidance-domestic-violence-and-abuse-how-health-services-social-care-and-the-organisations-they-work-with-can-respond-effectively-pdf>

This guidance is intended for health and social care commissioners, specialist domestic violence and abuse staff and others whose work may bring them into contact with people who experience or perpetrate domestic violence and abuse. It does not deal with child abuse but it does include support for children affected by domestic violence and abuse. The recommendations in the guideline cover a broad spectrum of domestic violence and abuse including violence perpetrated on men, people in same-sex relationships, and young people. Multi-agency partnerships are stated to be the best way to approach the issue of domestic violence and the necessity for initial and on-going staff training and organisational support is emphasised. The guideline states that there was insufficient evidence to make recommendations on primary prevention programmes as most of the evidence related to interventions in educational settings and such interventions were outside of the scope of the guideline unless they were delivered by health or social care professionals.

The supporting evidence on which the guideline was based, including a very comprehensive (800+ pages) review of interventions to identify, prevent, reduce and respond to domestic violence, can be downloaded here:

<http://www.nice.org.uk/guidance/ph50/evidence>

The Royal Australian College of General Practitioners. 2014. **Abuse and violence: Working with our patients in general practice, 4th edn.** Melbourne: The Royal Australian College of General Practitioners. <http://www.racgp.org.au/download/Documents/Guidelines/Whitebook/whitebook-4thedn.pdf>

This comprehensive guideline provides health practitioners with evidence-based guidance on identification and response in clinical practice to patients experiencing violence and abuse. It focuses particularly on intimate partner and sexual violence and on children experiencing abuse, but there are also chapters on abuse of elderly and disabled people, violence in Aboriginal and Torres Strait Islander and migrant and refugee communities, legal matters and practitioner self-care. Levels of evidence and grades of evidence are presented for recommendations using the system of the National Health and Medical Research Council.

World Health Organization. 2013. **Responding to intimate partner violence and sexual violence against women WHO clinical and policy guidelines.** Geneva: World Health Organization. http://apps.who.int/iris/bitstream/10665/85240/1/9789241548595_eng.pdf

These guidelines are aimed at health care providers and they also seek to raise awareness of violence against women among health care providers and policy makers. They are based on systematic reviews of the evidence regarding identification and clinical care for intimate partner violence, clinical care for sexual assault, and training on intimate partner violence and sexual assault against women, and they also cover policy and programmatic approaches to delivering services and mandatory reporting of intimate partner violence. The recommendations in the guideline are accompanied by an indication of the evidence quality and are graded as either 'strong' or 'conditional'.

A summary of the WHO guidelines is contained in the following article:

Feder G, Wathen C, MacMillan HL. 2013. **An evidence-based response to intimate partner violence: WHO guidelines.** JAMA, 310(5), 479–80. <http://dx.doi.org/10.1001/jama.2013.167453>

Moyer VA. 2013. **Screening for Intimate Partner Violence and Abuse of Elderly and Vulnerable Adults: U.S. Preventive Services Task Force Recommendation Statement.** Annals of Internal Medicine, 158(6), 478–86. <http://dx.doi.org/10.7326/0003-4819-158-6-201303190-00588>

This recommendation statement from the USPSTF is based on a commissioned systematic review of the evidence on screening women for intimate partner violence (IPV) and elderly and vulnerable adults for abuse and neglect. The review examined the accuracy of screening tools for identifying IPV and the benefits and harms of screening women of child-bearing age and elderly and vulnerable adults. The USPSTF considered that there was adequate evidence from RCTs to support a variety of interventions for women of childbearing age that can be delivered in, or via referrals from, primary care (Grade 'B' recommendation). Interventions include counselling, home visits, information cards, referrals to community services, and mentoring support. Depending on the type of intervention, these services may be provided by clinicians, nurses, non-clinician mentors, social workers, or community workers. The USPSTF considered that the overall benefit of screening and interventions for women of childbearing age was moderate since it has been found to be associated with moderate health improvements through reduction in exposure to abuse, physical and mental harms, and mortality and the harms are deemed to be no greater than small. The USPSTF was unable to make any recommendations regarding screening of elderly or vulnerable adults because there were no studies on the accuracy, effectiveness or harms of screening in this population.

The systematic review on which this recommendation statement is largely based is:

Nelson HD, Bougatsos C, Blazina I. 2012. **Screening Women for Intimate Partner Violence: A Systematic Review to Update the U.S. Preventive Services Task Force Recommendation.** Annals of Internal Medicine, 156(11), 796–808. <http://dx.doi.org/10.7326/0003-4819-156-11-201206050-00447>

Evidence-based medicine reviews

Fellmeth Gracia LT, Heffernan C, Nurse J, et al. 2013. **Educational and skills-based interventions for preventing relationship and dating violence in adolescents and young adults.** Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD004534.pub3 <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD004534.pub3/abstract>

This review included 38 studies (15,903 participants). Eighteen (11,995 participants) were cluster RCTs and two were quasi-RCTs (399 participants). Results from 33 studies were included in the meta-analyses. A meta-analysis of eight studies ($n=3,405$) assessed the effect of intervention on episodes of relationship violence. The risk ratio (RR) was 0.77 (95% confidence interval (CI) 0.53 to 1.13). There was substantial heterogeneity for this outcome ($I^2=57%$). Twenty-two studies ($n=5,256$) were included in the meta-analysis assessing attitudes towards relationship violence. The standardised mean difference (SMD) was 0.06 (95% CI -0.01 to 0.15). Four studies ($n=887$) were included in the meta-analysis assessing behaviour related to relationship violence; the SMD was -0.07 (95% CI -0.31 to 0.16). Ten studies ($n=6,206$) were included in the meta-analysis assessing knowledge related to relationship violence; the results showed an increase in knowledge in favour of the intervention (SMD 0.44, 95% CI 0.28 to 0.60) but there was substantial heterogeneity ($I^2=52%$). Seven studies ($n=1,369$) were included in the meta-analysis assessing skills related to relationship violence. The SMD was 0.03 (95% CI -0.11 to 0.17). None of the included studies assessed physical health, psychosocial health or adverse outcomes. Subgroup analyses showed no statistically significant differences by intervention setting or type of participants. The review authors stated that quality of evidence for all outcomes included in their meta-analysis was moderate due to an unclear risk of selection and detection bias and a high risk of performance bias in most studies. They concluded that their review provided no evidence for the effectiveness of interventions on episodes of relationship violence or on attitudes, behaviours and skills related to relationship violence. While there was a small increase in knowledge, there was evidence of substantial heterogeneity among studies. They stated that further studies with long term follow up are needed, and that study authors should use standardised and validated measurement instruments to ensure comparability of results.

Taft A, O'Doherty L, Hegarty K, et al. 2013. **Screening women for intimate partner violence in healthcare settings.**

Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD007007.pub2

<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD007007.pub2/abstract>

This review aimed to assess the effectiveness of intimate partner violence (IPV) screening in healthcare settings for identification, referral to support agencies and health outcomes of women affected by IPV. It included 11 RCTs or quasi-RCTs involving 13,207 women in total. Of the 10 studies for which it was possible to assess risk of bias, six were judged to be at high risk. Combined data from six comparable studies ($n=3,564$) indicated that screening increased identification of victims/survivors (risk ratio 2.33, 95% CI 1.40–3.89), particularly in antenatal settings (RR 4.26; 95% CI 1.76–10.31). Only three studies ($n=1400$) measured referral to support agencies. There was no evidence that screening increased referrals, as although numbers of referral increased in the screened group, the increase was not statistically significant due to small numbers (RR 2.67; 95% CI 0.99–7.20). The only two studies that measured women's experience of violence after screening (one at three months and the other at six, 12 and 18 months after screening) found no significant reduction of abuse. Only one study measured adverse effects from screening; its results suggested that screening does not cause harm. This same study showed a non-significant trend towards improved mental health in the screened women. No studies included an economic evaluation and there was insufficient evidence to determine whether screening increased the uptake of specialist services. The review authors concluded that screening is likely to increase identification rates but rates of referral to specialist agencies are low and there is little information about proportions of false screening results, either negative or positive. They stated that screening does not appear to cause harm but there insufficient evidence of long term benefit to justify universal screening in healthcare settings. They suggest that further studies comparing screening with case finding (with or without advocacy or therapeutic interventions) for women's long term wellbeing would help to inform IPV policies in health care settings.

Jahanfar S, Janssen Patricia A, Howard Louise M, et al. 2013. **Interventions for preventing or reducing domestic violence against pregnant women.** Cochrane Database of Systematic Reviews

doi:10.1002/14651858.CD009414.pub2 <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD009414.pub2/abstract>

Domestic violence during pregnancy threatens the wellbeing of both mother and baby. This review sought to determine the effectiveness and safety of interventions to prevent or reduce violence against pregnant women. It included RCTs including cluster RCTs and quasi-RCTs. There were nine trials in total with 2,391 women but for most outcomes there was only one study which contributed relevant data. One study provided evidence that the total number of women reporting episodes of partner violence during pregnancy, and in the postpartum period, was reduced for women receiving a psychological therapy intervention (risk ratio (RR) 0.62, 95% CI 0.48–0.88). For depression during pregnancy and the post-partum period, there were few statistically significant differences between the control and intervention groups. Only one study reported on neonatal outcomes such as preterm delivery and birthweight: it found no clinically significant differences between groups. No studies reported on other secondary outcomes: miscarriage, stillbirth, maternal mortality, antepartum haemorrhage, placental abruption, neonatal death, and Apgar score less than seven at one minute and five minutes. The review authors concluded that there was insufficient evidence to assess the effect of domestic violence interventions on pregnancy outcomes and that high quality, adequately powered RCTs are needed in this area.

Ramsay J., Carter Y., Davidson L., et al. 2009. **Advocacy interventions to reduce or eliminate violence and promote the physical and psychosocial well-being of women who experience intimate partner abuse.** Cochrane

Database Systematic Reviews doi: 10.1002/14651858.CD005043.pub2.

<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD005043.pub2/abstract>

This review aimed to assess the effects of advocacy interventions, conducted either within or outside of health care settings, on women who have suffered intimate partner abuse. It included 10 RCTs involving 1,527 participants. There was considerable heterogeneity between studies in intensity of advocacy, outcome measures and duration of follow-up (from straight after the intervention to three years later) so meta-analysis was possible for only a few outcomes. Intensive advocacy (for 12 hours or more) may help end physical abuse in women leaving domestic violence shelters or refuges at 12–24 months follow-up (odds ratio 0.43, 95% CI 0.23–0.80), but not at up to 12 months follow-up. It may also improve quality of life at 12 months follow-up, but the confidence intervals for this outcome included zero (weighted mean difference 0.23, 95% CI 0.00–0.46). It did not improve depression nor psychological distress at 12 months follow-up (depression WMD -0.05 , 95% CI -0.19 to 0.09 , psychological distress SMD -0.16 , 95% CI -0.39 to 0.06). It was possible to do only two meta-analyses of brief advocacy interventions (less than 12 hours' duration). These indicated that an increased use of safety behaviours was consistent with the receipt of brief advocacy both at up to 12 months (WMD 0.60, 95% CI 0.14–1.06) and at 12–24 months (WMD 0.48, 95% CI 0.04–0.92) follow up. The review authors concluded that the evidence indicates it is possible that intensive advocacy for women recruited from domestic violence refuges or shelters reduces physical abuse one to two years after the intervention but it is uncertain if it has a beneficial effect on their mental health or quality of life. They also stated that there was insufficient evidence to determine whether or not less intensive interventions in healthcare settings for women who are still living with abusive partners are effective.

Hegarty K, Taft A, Feder G. 2008. **Violence between intimate partners: working with the whole family**. 337, a389. <http://www.bmj.com/content/337/bmj.a839>

This useful article reviews the evidence on the identification and management of intimate partner violence in families and summarises primary care guideline recommendations from an international consensus group led by the authors. It states that although systematic reviews have concluded that there is insufficient evidence to support a policy of screening in clinical settings, expert consensus recommends a low threshold for asking about intimate partner violence. It offers suggestions for questions practitioners can use if they suspect intimate partner violence, and it also covers ways to respond if women disclose intimate partner violence, referral to other agencies, stages of change and planning for safety, psychological interventions, and managing other members of the family.

Other relevant publications

Dobbs T, Eruera M. 2014. **Kaupapa Māori wellbeing framework: The basis for whānau violence prevention and intervention**. Auckland: New Zealand Family Violence Clearinghouse, University of Auckland. <https://nzfvc.org.nz/issues-papers-6>

The purpose of this paper is to identify some key considerations for implementing kaupapa Māori frameworks for whānau violence prevention and intervention programmes at government and iwi level, and also at provider and practice level. The first section includes the Mauri Ora framework, E Tu Whānau, and an overview of research and evaluation in this area, and describes what Māori have had to say about preventing and intervening in whānau violence. The second gives an overview of the historical and contemporary factors that have led to the whānau violence problem. The third discusses the implementation of the Mauri Ora framework within the Amokura programme, as an example of what the framework looks like when a violence prevention intervention applies the theory, principles and values of the framework. The final section contains recommendations derived from key learnings from the Amokura programme.

MacMillan HL, Wathen CN. 2014. **Children's Exposure to Intimate Partner Violence**. Child Adolesc Psychiatr Clin N Am, 23(2), 295–308

This recent paper is a concise review dealing with children's exposure to intimate partner violence (IPV). It covers the definition and epidemiology of IPV, risk and protective factors, effects of IPV on children, and strategies for identifying and addressing IPV in the clinical setting under four headings: identification and assessment, prevention, treatment, and systems issues. The authors stated that there is an increasing evidence base regarding interventions aimed at responding to children who have experienced IPV but further replication studies are needed to assess the extent to which such interventions are generalisable to settings other than those of the original trials. They also stated that there is emerging evidence on specific forms of mother-child, and child-focused, therapies in families where there is IPV and this evidence offers hope that clinicians can make referrals that can improve the health and wellbeing of these children.

Ball J, Quigley and Watts Ltd. 2013. **Effectiveness of relationship education programmes in schools for years 7–13: A rapid literature review prepared for families commission**. Wellington: Families Commission. <http://www.familiescommission.org.nz/sites/default/files/downloads/relationship-education-in-schools.pdf>

This rapid review identified three main bodies of relevant research: on 'social and emotional learning/wellbeing' (SEL); on 'dating violence', which is part of the wider field of violence prevention and overlaps with the SEL literature; and on sexuality education. Almost all of this research originated in North America. Reviews of school-based 'social and emotional learning' programmes indicate that these can produce positive outcomes in various areas, and can reduce risk factors for relationship violence among adolescents. Two school-based dating violence prevention programmes, *Safe Dates* and *The Fourth R*, are generally agreed to be affective, but others have been shown to be ineffective or even harmful. Most programmes have been evaluated using weak methodologies or not at all, so their effectiveness is unknown. The sexuality education literature is in broad agreement that emotional and interpersonal skills are an important, but often neglected, area in sexuality education. While there are some fundamental gaps in knowledge about what works in relationship education, common characteristics of successful programmes include being: informed by theory and evidence, holistic and strengths-based, integrated into the curriculum, aimed at influencing specific risk factors/protective factors/core competencies, focused on developing personal or social skills, cognisant of environmental influences, developmentally and culturally appropriate, personally and immediately relevant; delivered by well-trained and supported educators, with appropriate skills and qualities, using active teaching methods; and evaluating process and outcomes. 'One off' sessions are generally agreed to be ineffective, as are lecture style sessions that focus only on knowledge acquisition.

The review author did not find any robust long term evaluations of any New Zealand classroom-based relationship education programmes, but she noted that there is good evidence that school-wide efforts to improve behaviour, school culture and relationships in general can be very successful, especially when they are based on Māori relational concepts and practices. There is little evidence regarding 'relationship education' for Māori and Pacific students but the literature stresses the importance of Māori and Pacific communities defining their own aspirations and drawing on traditional knowledge, concepts and practise to find solutions, and of involving Māori and Pacific parents and elders in developing programmes relating to sexuality and healthy relationships.

Murphy C, Farnslow J. 2012. **Building collaborations to eliminate family violence: facilitators, barriers and good practice.** Auckland: New Zealand: New Zealand Family Violence Clearinghouse, The University of Auckland. <https://nzfvc.org.nz/sites/nzfvc.org.nz/files/Issues%20Paper%201%20-%20NZFVC%207%203%2012.pdf>

This issues paper from the New Zealand Family Violence Clearinghouse offers a broad perspective on challenges and best practices relating to coordinated collaborative initiatives, both in general and specifically in the area of family violence. It explores the current New Zealand situation regarding collaborative work on family violence. It is based on a literature review and discussions with key informants (people with long experience of community-based family violence networks). A key message of this paper is that coordinated and collaborative responses to family violence lead to better outcomes for both victims and perpetrators.

Murphy C, Farnslow J. 2012. **Tools to support multi-agency collaboration.** Auckland: New Zealand Family Violence Clearinghouse, The University of Auckland. <https://nzfvc.org.nz/sites/nzfvc.org.nz/files/tools-to-support-multi-agency-collaboration-2012.pdf>

This publication contains a list of articles, reports and tools (with web links) that was collated during the development of the above paper. While it is not exhaustive or definitive, it is intended to provide readers with helpful tips, tools and strategies which the authors consider to be critical to the effective functioning of collaborative family violence initiatives. The topics covered are: tangata whenua; general information about multi-agency collaboration; case management resources; diversity resources; communication skills; prevention; real stories; gender analysis; national accountability framework; and governance.

Hegarty K, O'Doherty L. 2011. **Intimate partner violence Identification and response in general practice.** Australian Family Physician, 40, 852–56. <http://www.racgp.org.au/afp/2011/november/intimate-partner-violence/>

This is a concise, accessible and well-referenced article discussing identifying intimate partner violence in women who present to general practice.

Thackeray JD, Hibbard R, Dowd MD, et al. 2010. **Intimate Partner Violence: The Role of the Pediatrician.** Pediatrics, 125(5), 1094–100. <http://pediatrics.aappublications.org/content/125/5/1094.abstract>

This clinical report from the American Academy of Pediatrics addresses the role of the paediatrician (who, in the US, is often a provider of primary health care) in identifying and responding to intimate partner violence (IPV). It states that children exposed to IPV are at increased risk of abuse and neglect, and of developing physical, behavioural, psychological and social disorders later in life, and that paediatricians should be aware of the profound effects of exposure to IPV on children.

Websites

Accident Compensation Corporation. 2014. **Mates & Dates.** <http://www.acc.co.nz/preventing-injuries/at-school/mates-dates/index.htm>

Mates & Dates is a healthy relationships pilot programme for secondary school students. It is designed to help prevent sexual and dating violence by teaching young people relationship skills and behaviours they can carry with them throughout their lives. It is not just about dating relationships but about all kinds of relationships including those with friends and whānau. The programme is being piloted in selected secondary schools in term 3 of 2014.

Shine*. <http://www.2shine.org.nz/>

Shine* is a national domestic abuse charity. Their website has a range of resources related to family violence, including an introductory booklet 'Safer Homes in New Zealand' which can be downloaded here: <http://www.2shine.org.nz/library/Documents/1301003164shn10004safeathomebookletwebdps.pdf> .

Ministry of Social Development. 2014. **Family Violence It's not OK.** <http://www.areyouok.org.nz/>

The *It's not OK* campaign is led by the Ministry of Social Development in association with communities. This large site has a wide range of resources for people experiencing violence, their families, friends and colleagues, community organisations, employers and community leaders. The campaign research and evaluation publications are on this page: <http://www.areyouok.org.nz/resources/research-and-evaluation/> .

Ministry of Justice. 2014. **Family violence cross-government package.** <http://www.justice.govt.nz/publications/global-publications/f/family-violence-cross-government-package/family-violence-cross-government-package>

In July 2014 the Prime Minister announced a cross-Government package to better protect victims of family violence. This site contains links to the relevant page on the Beehive site, and to the relevant cabinet papers, which contain more details on the package.

New Zealand Family Violence Clearinghouse. 2014. **Changes to domestic violence programmes by Ministry of Justice, Department of Corrections.** <https://nzfvc.org.nz/?q=node/1657>

Both the Ministry of Justice and the Department of Corrections are changing their domestic violence programmes. This web page provides a brief overview of changes to Ministry of Justice funded programmes, and a new domestic violence programme for community offenders to be piloted by the Department of Corrections.

New Zealand Family Violence Clearinghouse. <https://nzfvc.org.nz/>

The New Zealand Family Violence Clearinghouse is the national centre for collating and disseminating information about domestic and family violence in Aotearoa New Zealand. It is funded by the Families Commission and located at the School of Population Health, the University of Auckland. The library on this site contains a large number of resources, particularly New Zealand publications. The library search engine does not make it easy to search for evidence-based prevention interventions specifically so the assistance of a librarian may need to be sought.

Note: The publications listed above were identified using the search methodology outlines in **Appendix 1**

APPENDICES AND REFERENCES



APPENDIX 1: SEARCH METHODS FOR POLICY DOCUMENTS AND EVIDENCE-BASED REVIEWS

One of the features of this reporting series is the inclusion of sections which briefly review Government documents, particularly Ministry of Health publications, and international evidence-based reviews that are relevant to the prevention and or management of child and youth health issues. The approach taken in these sections borrows heavily from the principles of the Evidence-Based Medicine (EBM) movement, which has emerged in recent decades as a means of providing busy clinicians with up to date overviews of the evidence in particular areas [409,410]. Evidence-based reviews generally rely on reviewers collating all of the available research evidence (including published and unpublished trials, and observational studies), evaluating it in a rigorous manner, and then publishing the resulting synthesis of the evidence in a format which allows clinicians to quickly evaluate the effectiveness of the intervention(s) reviewed. The evidence base for population level interventions is less developed than that for individual patient therapies because population level interventions tend to be more difficult to evaluate as they often require longer follow up times and have more diffuse outcomes and less readily identifiable “control” groups [410]. Nevertheless, there is a reasonable body of evidence about the effectiveness of specific population level interventions.

The brief overviews presented in this report aim to provide busy DHB staff with a logical starting point from which to consider the types of interventions available to address particular child and youth health issues. The methodology used to prepare these overviews was not exhaustive but it involved searching a number of EBM journals and databases (e.g. the Cochrane Library) as well as Ovid MEDLINE and PubMed for systematic reviews of population level interventions in child and youth health (see Text Box below).

Methodology used in preparing Policy/Evidence-Based Review Sections

New Zealand (health) policy documents

Each review section aims to provide an overview of Ministry of Health (or where appropriate, other Government Agency) policy documents and strategies relevant to the area. The Ministry of Health’s website (<http://www.moh.govt.nz/moh.nsf>) was searched for key documents. All identified documents were then reviewed and the most relevant summarised, focussing on those which provided strategic guidance to DHBs on the prevention/population level management of the issues in question.

Evidence-based and other reviews

The five databases listed below were searched for reviews considering the effectiveness of population level interventions to prevent and/or manage each of the issues in question. While this list is not exhaustive, the databases were selected on the basis of the calibre of the institutions publishing the reviews. The search strategy concentrated on publications which attempted to synthesise all of the available evidence, thereby providing as broad as possible coverage of the relevant literature. In general, only literature from 2005 onwards was searched, although earlier publications were included if there was a paucity of more recent information. While individual trials and protocols were not specifically sought, if there was no other relevant information available, an attempt was made to locate individual research reports or recommendations. While the brief overviews provided in this report are not totally comprehensive, it is nevertheless hoped that they will provide a useful starting point for DHBs wishing to explore strategies to address particular child and youth health issues.

Evidence-Based Medicine Reviews: This database allows seven EBM resources to be searched at once including the Database of Reviews of Effects (DARE), Health Technology Assessments (HTA) and the NHS Economic Evaluation Database (NHSEED) all produced by National Health Services’ Centre for Reviews; and Dissemination at the University of York, UK, the Cochrane Database of Systematic Reviews, and the ACP Journal Club.

National Guideline Clearinghouse (<http://www.guideline.gov/>): This is a searchable database of evidence-based clinical practice guidelines maintained by the Agency for Healthcare Research and Quality in the United States.

Centre for Reviews and Dissemination (CRD): This is a Department of the University of York and is part of the National Centre for Health Research (NCHR) (<http://www.york.ac.uk/inst/crd/>). While CRD produces the database of Review Effects (DARE), captured in the Evidence-Based Medicine Review Database, searching the CRD site identifies other reviews not captured by DARE. This database is available through most local library services.



National Institute for Health and Clinical Excellence (NICE): This is an independent organisation based in the United Kingdom which provides national guidance on the promotion of good health and the prevention and treatment of ill health (<http://www.nice.org.uk/>).

Guide to Community Preventive Services: Systematic Reviews and Evidence-Based Recommendations: This guide was developed by the non-federal Task [Force on Community Preventive Services](#) whose members are appointed by the Director of the Centre for Disease Control and Prevention (CDC). The Community Guide summarises what is known about the effectiveness, economic efficiency, and feasibility of interventions to promote community health and prevent disease (<http://www.thecommunityguide.org/about/>).

While undertaking this task it quickly became apparent that the quality of evidence varied considerably depending on the issue reviewed. In addition, in many cases, the research provided reasonably strong guidance about what did not work but little guidance on effective interventions. As an example, current evidence suggests additional social support is ineffective in preventing preterm birth in high-risk women, but there is scant evidence indicating effective interventions in this population.

In many cases, therefore, these brief overviews serve to highlight the current paucity of evidence on population level interventions to address child and youth health needs (although the absence of systematic/other reviews does not rule out the existence of individual studies in particular areas). In this context, the search strategy utilised did not aim primarily to identify individual studies or reviews of individual patient therapies. In cases where such studies were identified and where no other systematic reviews were available, they have been included under the heading of “Other Relevant Publications”. In such cases the reader needs to be aware that these studies were identified in a non-systematic manner and that their findings should therefore not be given the same weight as the findings from systematic reviews (e.g. Cochrane reviews) where all of the available evidence has been rigorously evaluated. The evidence-based review tables also include some topical New Zealand research publications.



APPENDIX 2: STATISTICAL SIGNIFICANCE TESTING AND ITS USE IN THIS REPORT

Understanding Statistical Significance Testing

Inferential statistics are used when a researcher wishes to use a sample to draw conclusions about the population as a whole (e.g. weighing a class of 10 year old boys, in order to estimate the average weight of all 10 year old boys in New Zealand). Any measurements based on a sample, however, even if drawn at random, will always differ from that of the population as a whole, simply because of chance. Similarly, when a researcher wishes to determine whether the risk of a particular condition (e.g. lung cancer) is truly different between two groups (smokers and non-smokers), they must also consider the possibility that the differences observed arose from chance variations in the populations sampled.

Over time, statisticians have developed a range of measures to quantify the uncertainty associated with random sampling error (e.g. to quantify the level of confidence we can have that the average weight of boys in our sample reflects the true weight of all 10 year old boys, or that the rates of lung cancer in smokers are really different to those in non-smokers). Of these measures, two of the most frequently used are:

P values: The p value from a statistical test tells us the probability that we would have seen a difference at least as large as the one observed, if there were no real differences between the groups studied (e.g. if statistical testing of the difference in lung cancer rates between smokers and non-smokers resulted in a p value of 0.01, this tells us that the probability of such a difference occurring if the two groups were identical is 0.01 or 1%. Traditionally, results are considered to be statistically significant (i.e. unlikely to be due to chance) if the probability is <0.05 (i.e. less than 5%) [411].

Confidence Intervals: A 95% Confidence Interval suggests that if you were to repeat the sampling process 100 times, 95 times out of 100 the confidence interval would include the true value. In general terms, if the 95% confidence intervals of two samples overlap, there is no significant difference between them (i.e. the p value would be ≥ 0.05), whereas if they do not overlap, they can be assumed to be statistically different at the 95% confidence level (i.e. the p value would be <0.05) [411].

The Use of Statistical Significance Testing in this Report

In the preparation of this report a large range of data sources was used. For the purposes of statistical significance testing, however, these data sources can be considered as belonging to one of two groups: Population Surveys and Routine Administrative Datasets. The relevance of statistical testing to each of these data sources is described separately below:

Population Surveys: A number of indicators in this report utilise data derived from national surveys (e.g. the 2009 New Zealand Tobacco Use Survey), where information from a sample has been used to make inferences about the population as a whole. In this context statistical significance testing is appropriate, and where such information is available in published reports, it has been incorporated into the text accompanying each graph or table. In a small number of cases, however, information on statistical significance was not available in published reports, and in such cases any associations described do not imply statistical significance.

Numbers and Rates Derived from Routine Administrative Data: A large number of the indicators in this report are based on data derived from New Zealand's administrative datasets (e.g. National Minimum Dataset, National Mortality Collection), which capture information on all of the events occurring in a particular category. Such datasets can thus be viewed as providing information on the entire population, rather than a sample and as a



consequence, 95% confidence intervals are not required to quantify the precision of the estimate (e.g. the number of leukaemia deaths in 2003–2007 although small, is not an estimate, but rather reflects the total number of deaths during this period). As a consequence, 95% confidence intervals have not been provided for any of the descriptive data (numbers, proportions, rates) presented in this report, on the basis that the numbers presented are derived from the total population under study.

Rate ratios Derived from Routine Administrative Data: In considering whether statistical significance testing is ever required when using total population data Rothman [412] notes that if one wishes only to consider descriptive information (e.g. rates) relating to the population in question (e.g. New Zealand), then statistical significance testing is probably not required (as per the argument above). If, however, one wishes to use total population data to explore biological phenomena more generally, then the same population can also be considered to be a sample of a larger super-population, for which statistical significance testing may be required (e.g. the fact that SUDI in New Zealand is 5 times higher in the most deprived areas (NZDep deciles 9–10) might be used to make inferences about the impact of the socioeconomic environment on SUDI more generally (i.e. outside of New Zealand, or the 5 year period concerned)). Similarly, in the local context the strength of observed associations is likely to vary with the time period under study (e.g. in updating 5-year asthma admission data from 2004–2008 to 2006–2010, rate ratios for Pacific children are likely to change due to random fluctuations in annual rates, even though the data utilised includes all admissions recorded for that particular 5-year period). Thus in this report, whenever measures of association (i.e. rate ratios) are presented, 95% confidence intervals have been provided on the assumption that the reader may wish to use such measures to infer wider relationships between the variables under study [412].

The Signalling of Statistical Significance in this Report

In order to assist the reader to identify whether tests of statistical significance have been applied in a particular section, the statistical significance of the associations presented has been signalled in the text with the words *significant*, or *not significant* in italics. Where the words *significant* or *not significant* do not appear in the text, then the associations described do not imply statistical significance or non-significance.



APPENDIX 3: THE NATIONAL MINIMUM DATASET

Introduction

The National Minimum Dataset (NMDS) is New Zealand's national hospital discharge data collection and is maintained by the Ministry of Health (the Ministry). The information contained in the dataset has been submitted by public hospitals in a pre-agreed electronic format since 1993. Private hospital discharges for publicly funded events (e.g. births, geriatric care) have been submitted electronically since 1997. The NMDS was implemented in 1993, and contains public hospital information from 1988 [413]. Information in the NMDS includes principal and additional diagnoses, procedures, external causes of injury, length of stay and sub-specialty codes; and demographic information such as age, ethnicity and usual area of residence.

The NMDS is useful for monitoring children's hospital admissions, predicting future health service demand, and planning new services and interventions. However, there are a number of issues to take into account when interpreting information from the NMDS. Many of these issues arise from regional differences in the way data are reported to, or coded in, the NMDS. These include:

1. Differences in the way DHBs report their Emergency Department (ED) cases to the NMDS and how this has changed over time.
2. The changeover from the ICD-9 to ICD-10 coding system and irregularities in the way in which diagnoses and procedures are allocated ICD codes.
3. Changes in the way ethnicity information has been recorded over time.

This Appendix considers the first two issues, while the third is considered in **Appendix 6**, which reviews the way ethnicity information is collected and coded in the health sector.

1. Differences in the Reporting of ED Cases to the NMDS

Historically there have been differences in the way DHBs have reported their ED events to the NMDS, which pose challenges for the interpretation of hospital admission data. This section provides a brief overview of how DHBs have been reporting their ED cases to the NMDS, as well as the different settings DHBs use to assess children presenting acutely with medical conditions. The rationale for the NZ Child and Youth Epidemiology Service's (NZCYES) approach to the analysis of hospital admissions is then presented before the potential impacts of inconsistent reporting of ED cases to the NMDS on trends in hospital admissions for children are considered.

Defining Hospital Admissions

In New Zealand, a hospital admission is defined as a hospital event with a treatment time of more than three hours (this is referred to as the three hour rule). Treatment time is counted from when the patient first sees the doctor (or other health professional) rather than when they first arrive in ED [413].

Admissions that meet the three hour rule are sometimes subdivided into: day cases (or day patients) where the patient is admitted and discharged (routinely/alive) on the same day, and inpatient events where the patient spends at least one (mid)night in hospital [414]. Other DHBs, however, include all cases meeting the three hour rule in their definition of an inpatient event (personal communication Ministry staff).

Note: Throughout this report, the term hospital admission has been used in preference to hospital discharge in the description of child hospitalisation.



Regional Differences in the Reporting of ED Cases

Regional variations in the way DHBs report their ED day cases to the NMDS include the following:

1. During the mid-1990's, the Starship Children's Hospital (which provided inpatient services to the Auckland and Waitemata DHBs) started reporting ED events if the total time in the ED (including waiting time) exceeded 3 hours rather than reporting only ED events where treatment time exceeded 3 hours [414]. Following advice from the Ministry this practice ceased in January 2005. However, it took several years for the hospital to begin reporting its ED cases consistently again as changes in recording practice (i.e. recording the time of first treatment by a doctor rather than time of first triage) took time to implement. This resulted in large variations in rates in the Auckland and Waitemata DHBs during the mid-1990s to early 2000s.
2. In a number of DHBs, ED cases have been assigned the health specialty code of the consulting doctor on discharge, even though the patient was discharged directly from ED (e.g. a child with a fracture seen by an orthopaedic registrar in ED receiving an orthopaedic specialty code instead of an ED one). This practice has varied both over time and by region and makes the identification of ED cases using the health specialty code on discharge difficult. A separate ED identifier code was introduced in 2007, but adoption by DHBs has been variable (personal communication Ministry staff).
3. The way DHBs manage the assessment of paediatric medical cases also varies around the country. In the large Auckland DHBs, the majority of children can access acute paediatric care via specialist paediatric EDs, which are staffed by specialist paediatric staff. In other parts of the country, children are either assessed in paediatric assessment units (PAUs, often attached to the paediatric ward), or sent to the general paediatric ward for review. During 2008–2012, the proportion of admissions for medical conditions with a social gradient receiving an ED specialty code varied markedly by DHB. It was highest in the large Auckland DHBs (range 25%–50%) which see the majority of their children in specialist paediatric EDs, and lowest in those DHBs that assess most children on the paediatric ward (e.g. 0%–7% in some smaller DHBs).
4. Analysis of medical day cases (where the child is admitted and discharged the same day) also suggest that many non-Auckland DHBs were assessing these cases in a non-ED setting and assigning them a paediatric medical specialty code on discharge, rather than simply failing to report their ED cases to the NMDS. In an analysis of 2008–2012 data, over 85% of day case admissions for medical conditions with a social gradient in the South Island had a non-ED specialty code on discharge, as compared to only 10% in the Auckland DHB.
5. While the three hour rule has remained unchanged, to address inconsistency, the Ministry implemented a new directive in July 2009 that made it mandatory for DHBs to report ED cases meeting the three hour rule. While most DHBs (including all of the Auckland DHBs and many medium sized and smaller DHBs) were reporting their ED cases consistently prior to this time or do not appear to have changed their practice during the past decade, in a small number of DHBs there was an abrupt increase in the reporting of ED cases from 2009. In most cases, the number of additional cases reported was relatively modest, however the staggered increase in reporting from 2009 resulted in a gradual increase in the number of admissions in subsequent years.



The Ministry's Approach to Inconsistent ED Reporting

To minimise the impact of the inconsistent reporting of ED cases, the Ministry utilises a set of filters that aim to create comparability between regions, and over time, when analysing trends in hospital admission data. While these filters vary with the work being undertaken, the majority exclude short stay ED events. For example:

1. In its Hospital Throughput Reports [415], the Ministry excluded all cases where: the admission and discharge date were the same (length of stay = 0), AND the patient was discharged alive, AND the health specialty code on discharge was Emergency Medicine (M05, M06, M07, and M08).
2. In a review of hospitalisations for intentional self-harm [416], the Ministry excluded all hospital admissions with a health specialty code on discharge of Emergency Medicine (M05, M06, M07, and M08) AND a length of stay of less than two days.
3. When monitoring ambulatory sensitive hospital admissions, the Ministry has traditionally excluded all ED short stay cases from its analysis (personal communication Ministry staff).

Limitations of the Ministry's ED Filters in the Paediatric Context

For children's medical admissions however, excluding all ED day cases from the analysis is problematic as:

1. The desire to manage children in a developmentally appropriate healthcare environment that is separate from sick adults [417] has led to a plurality of acute assessment practices around the country. As previously discussed, this includes the use of specialist paediatric emergency departments in larger centres, PAUs attached to children's wards in many regional centres, and the fast tracking of children to the general paediatric ward in some smaller DHBs. Applying the Ministry's ED day case filters in this context excludes a high proportion of the workload of the three Auckland DHBs that assess much of their acute caseload in the specialist ED setting. However, the same filters include the workload of those DHBs that undertake similar acute assessments in a ward based setting. When ED cases are excluded, paediatric admissions for medical conditions with a social gradient in the Waitemata and Auckland DHBs fall well below those of New Zealand's other DHBs.
2. The majority of medical admissions in children are for acute onset infectious and respiratory diseases of relatively short duration. Exclusion of those with a length of stay of 0 days (as per some Ministry filters) means that those children who begin their treatment late at night and are discharged in the early hours of the following morning are included as hospital admissions, whereas those who begin their treatment in the morning and are discharged in the evening are excluded, even though they may have a similar or longer length of stay. (Note: Some Ministry filters exclude admission with a length of stay of 0 or 1 day in an attempt to address this issue).
3. Historically, concerns have been expressed about the high costs of after-hours primary care [418], with some families potentially bypassing after hours services in favour of the ED, which is free. Analysis of children's ED presentations for minor medical conditions may be one way of monitoring improvements/emergent barriers in family's access to primary care (particularly in those DHBs which have been reporting their ED cases to the NMDS consistently over time). The exclusion of ED cases from time series analysis however, precludes the identification of emerging concerns in this area.



NZCYES' Approach to the Analysis of Hospital Admission Data

Given the plurality of approaches (specialist ED, PAU, general paediatric ward) to the assessment of children requiring acute paediatric care, the NZCYES has from the outset chosen to include all ED day cases in its analysis of hospital admissions for medical conditions. The NZCYES believes that this provides the best comparison of the workload of DHBs of differing sizes around the country. However, in light of its concerns about inconsistencies in the reporting of ED cases to the NMDS, the NZCYES has always included an appendix in its reports to alert readers to these issues so that trend data can be interpreted with these concerns in mind.

For injuries, the NZCYES has adopted the Ministry's practice of filtering out ED cases based on the hypothesis that the processes for injury assessments is relatively consistent around the country (e.g. children presenting to ED with a fracture may be more likely to be assessed by ED staff, or by an orthopaedic registrar in ED, than to be sent to the ward for paediatric review). On this basis, filtering out ED cases is less likely to disproportionately discount the workload of the Auckland DHBs.

Further research is required to confirm this hypothesis. However, analysis of hospital admission data for 2008–2012 found that excluding ED cases resulted in paediatric medical admission rates in the Auckland and Waitemata DHBs being much lower than those of other DHBs. Including these cases resulted in rates that were somewhat higher. In contrast, for injuries, exclusion of ED cases resulted in admission rates that were a little lower than the NZ rate, whereas the inclusion of ED cases resulted in rates that were much higher. One possible interpretation of these differences is that the exclusion of ED cases in the context of injury admissions may not disproportionately discount the work of the large Auckland DHBs to the same extent as it does for medical admissions.

Implications for Interpretation

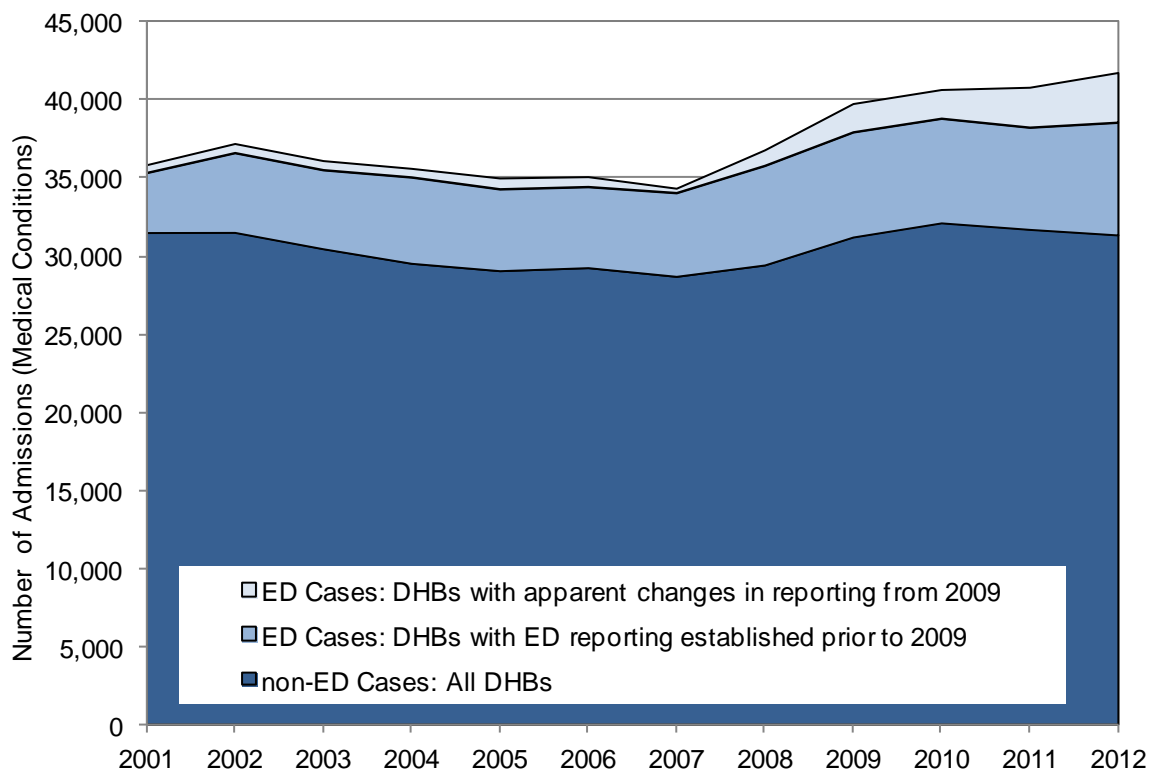
While the inclusion of ED cases is thought to provide the most meaningful comparison across DHBs, it has a number of implications for time series analysis. **Figure 198** shows trends in children's hospital admissions for medical conditions with a social gradient during 2001–2012. In this figure, admissions have been broken into three groups: 1) non-ED cases (e.g. those discharged with a paediatric medical/surgical specialty code); 2) ED cases in DHBs that consistently reported their ED cases prior to 2009 or where reporting did not change in or after 2009; 3) ED cases in DHBs where an abrupt increase in reporting was evident in or after 2009. Analysis suggests that:

- In the early 2000s, the correction of the historical under-reporting of ED cases by a number of Auckland and Upper North Island DHBs may have contributed to the increase in hospital admissions for medical conditions between 2000 and 2002.
- During 2002–2007, the declines seen in medical admissions may have been greater, had not a number of small to medium sized DHBs begun to report their ED cases more comprehensively.
- Since 2009, the correction of the under-reporting occurring in the remaining DHBs may have contributed to some of the rise seen in ED admissions. This in turn may have steepened the rate of increase in overall admissions seen during 2009–2012.
- Between 2007 and 2012, non-ED admissions and ED admissions in DHBs already reporting their ED cases consistently, rose from 34,054 to 38,608 (an increase of 4,554) while ED admissions in DHBs who appeared to change their reporting practices from 2009 rose from 271* to 3,206 (an increase of 2,935) (*2007 was an unusually low year due to a reporting anomaly in one DHB, with admissions averaging around 500–600 per year in the years immediately prior to 2007).



- It is difficult to determine how much of the increase in ED admissions in DHBs who changed their ED reporting practices in or after 2009, was due to the change in reporting practice and how much was due to a real rise in ED presentations. However, if the rate of increase in ED admissions during 2007–2012 for DHBs who did not change practice was applied to the DHBs that did, an additional 490 admissions might have been expected during this period. This is much lower than the 2,935 additional admissions seen (a net excess of 2,445 admissions).

Figure 198. Hospital admissions for medical conditions with a social gradient in children aged 0–14 years by health specialty on discharge and DHB reporting practice, New Zealand 2000–2012



Source: National Minimum Dataset; Note: Acute and arranged admissions only; ED cases are those with a health speciality code on discharge of M05–M08.

Other potential limitations to take into account when interpreting NMDS data include:

1. The inclusion of ED medical cases may lead to apparently higher admission rates for DHBs that have been reporting all of their ED cases consistently over time or that have been including triage or waiting time in the calculation of the three hour rule, when compared to DHBs that have been under-reporting their ED caseload. However, the extent to which these ED cases have been undercounted is difficult to quantify with many DHBs managing their acute assessments via PAUs or the paediatric ward. As a result, many acute assessments are assigned a M55 Paediatric Medicine speciality code on discharge (as there is no specific code for PAU) making them indistinguishable from other paediatric ward admissions.
2. Conversely, filtering out injury ED cases may have led to apparently lower injury admission rates in those DHBs who manage a higher proportion of their caseload in ED. Further, the resultant injury data are no longer representative of all types of injury presentation in children as they reflect only the more serious end of the spectrum. Finally, the filtered data are unable to provide any insights into changes in families' service access patterns (e.g. primary care vs. ED) for less serious injuries in children, thereby losing its capacity to provide an early warning of a shift in families health seeking behaviour for minor injuries.



2. Data Quality and Coding Changes over Time (ICD-9 and ICD-10)

Change Over from ICD-9 to ICD-10 Coding

From 1988 until June 1999, clinical information in the NMDS was coded using versions of the ICD-9 classification system (ICD-9 CM until June 1995, then ICD-9-CM-A until June 1999). From July 1999 onwards, the ICD-10-AM classification system has been used, although for time series analysis, back and forward mapping between the two systems is possible using pre-defined algorithms [419].

The introduction of ICD-10-AM represented the most significant change in the International Classification of Diseases (ICD) in over 50 years and uses an alphanumeric coding system for diseases in which the first character of the code is always a letter followed by several numbers. This has allowed for the expansion of the number of codes to provide for recently recognised conditions and to provide greater specificity about common diseases (there are about 8,000 categories in ICD-10-AM as compared to 5,000 in ICD-9). While for most conditions there is a reasonable 1:1 correspondence between ICD-9 and ICD-10 codes, for some this may lead to some irregularities in time series analysis [420]. Where possible such irregularities will be highlighted in the text, although care should still be taken when interpreting time series analysis across the 1999–2000 period as some conditions may not be directly comparable between the two coding systems.

Accuracy of ICD Coding

The Ministry has undertaken a number of reviews of the quality of ICD coding in the NMDS. In one audit 2,708 events were audited over 10 sites during a 3 month period during 2001/2002. Overall the audit found that 22% of events required a change in coding, although this also included changes at the fourth and fifth character level. The average ICD code change was 16%, with changes to the principal diagnosis being 11%, to additional diagnoses being 23% and to procedure coding being 11%. There were 1625 external causes of injury codes, of which 15% were re-coded differently [421]. These findings were similar to an audit undertaken a year previously.

While the potential for such coding errors must be taken into consideration when interpreting the findings of this report, it may be that the 16% error rate is an overestimate, as in the majority of the analyses undertaken in this report, only the principal diagnosis (with an error rate of 11%) is used to describe the reason for admission. In addition, for most admissions the diagnostic category (e.g. lower respiratory tract infections) is assigned using information at the 3 digit level (with the 16% error rate also including issues with coding at the 4th or 5th digit level).

3. Ethnicity Information in the NMDS

The reader is referred to **Appendix 6** for a discussion of this issue.

Conclusion

The inconsistencies outlined above tend to make time series analyses based on the NMDS less reliable than those based on Mortality or Birth Registration data (where legislation dictates inclusion criteria and the type of information collected). While using hospital discharge data still remains a valuable and reasonably reliable proxy for measuring the health outcomes of children and young people in this country, the reader is cautioned to take into consideration the issues discussed above, when interpreting the findings outlined in this report.



APPENDIX 4: THE BIRTH REGISTRATION DATASET

Mode of Data Collection

Since 1995 all NZ hospitals and delivering midwives have been required to notify Internal Affairs (within 5 working days of delivery), of the birth of a live or stillborn baby 20+ weeks' gestation or weighing >400g. Prior to 1995, only stillborn babies reaching 28+ weeks of gestation required birth notification. Information on the hospital's notification form includes maternal age, ethnicity, multiple birth status, and baby's sex, birth weight and gestational age. In addition, parents must complete a Birth Registration Form within two years of delivery, duplicating the above information with the exception of birth weight and gestational age, which are supplied only on hospital notification forms. Once both forms are received by Internal Affairs, the information is merged into a single entry. This two-stage process is thought to capture 99.9% of births occurring in New Zealand and cross-checking at the receipting stage allows for the verification of birth detail [54].

Interpretation of Information Derived from the Birth Registration Dataset

Because of the two-stage birth registration process, the majority of variables contained within the birth registration dataset are >98% complete, and cross-checking at the receipting stage (with the exception of birth weight and gestational age) allows for the verification of birth details. In addition, the way in which ethnicity is collected in this dataset confers a number of advantages, with maternal ethnicity being derived from the information supplied by parents on their baby's birth registration form. This has the advantage of avoiding some of the ambiguities associated with hospital and mortality data, which at times have been reported by third parties. Changes in the way ethnicity was defined in 1995 however make information collected prior to this date incomparable with that collected afterwards. For births prior to 1995, maternal ethnicity was defined by ancestry, with those having half or more Māori or Pacific blood meeting ethnic group criteria, resulting in three ethnic groups, Māori, Pacific and non-Māori non-Pacific. For births after 1995 maternal ethnicity was self-identified, with an expanded number of ethnic categories being available and parents being asked to tick as many options as required to show which ethnic group(s) they belonged to. For those reporting multiple ethnic affiliations a priority rating system was introduced, as discussed **Appendix 6** of this report.

Because this dataset captures 99.9% of births occurring in NZ, is >98% complete for most variables, collects self-reported ethnicity in a standard manner and is collated and coded by a single agency, information derived from this dataset is likely to be of higher quality than that derived from many of NZ's other data sources. Limitations however include the relatively restricted number of variables contained within the dataset (e.g. it lacks information on maternal smoking, Body Mass Index or obstetric interventions) and the lack of cross-checking for birth weight and gestational age (which is supplied only on the hospital notification form). The changeover in ethnicity definition during 1995 also prohibits time series analysis by ethnicity over the medium to long term. Finally, since the last report, the Ministry of Health has stopped providing stillbirth data in the Birth Registration Dataset, and thus all analyses based on this set are restricted to live births only. Each of these factors must thus be taken into account when interpreting information in this report that has been derived from the Birth Registration Dataset.



APPENDIX 5: THE NATIONAL MORTALITY COLLECTION

Mode of Data Collection

The National Mortality Collection is a dataset managed by the Ministry of Health which contains information on the underlying cause(s) of death as well as basic demographic data for all deaths registered in New Zealand since 1988. Data pertaining to fetal and infant deaths are a subset of the Mortality Collection, with cases in this subset having additional information on factors such as birth weight and gestational age [419].

Each month the Births, Deaths and Marriages service of the Department of Internal Affairs sends the Ministry of Health electronic death registration information, Medical Certificates of Cause of Death, and Coroner's reports. Additional information on the cause of death is obtained from the National Minimum Dataset (NMDS), private hospital discharge returns, the NZ Cancer Registry (NZCR), the Department of Courts, the Police, the Land Transport Authority (LTSA), Water Safety NZ, Media Search and from writing letters to certifying doctors, coroners and medical records officers in public hospitals. Using information from these data sources, an underlying cause of death (ICD-10-AM) is assigned by Ministry of Health staff using the World Health Organization's rules and guidelines for mortality coding [419].

Data Quality Issues Relating to the National Mortality Collection

Unlike the NMDS, where information on the principal diagnosis is coded at the hospital level and then forwarded electronically to the Ministry of Health, in the National Mortality Collection each of the approximately 28,000 deaths occurring in New Zealand each year is coded manually by Ministry of Health staff. For most deaths the Medical Certificate of Cause of Death provides the information required, although coders also have access to the information contained in the NMDS, NZ Cancer Registry, LSTA, Police, Water Safety NZ and ESR [420]. As a consequence, while coding is still reliant on the accuracy of the death certificate and other supporting information, there remains the capacity for a uniform approach to the coding which is not possible for hospital admissions data.

While there are few published accounts of the quality of coding information contained in the National Mortality Collection, the dataset lacks some of the inconsistencies associated with the NMDS, as the process of death registration is mandated by law and there are few ambiguities as to the inclusion of cases over time. As a consequence, time series analyses derived from this dataset are likely to be more reliable than that provided by the NMDS. One issue that may affect the quality of information derived from this dataset, however, is the collection of ethnicity data, which is discussed in more detail in **Appendix 6** of this report.



APPENDIX 6: THE MEASUREMENT OF ETHNICITY

The majority of rates calculated in this report rely on the division of numerators (e.g. hospital admissions, mortality data) by Statistics NZ Estimated Resident Population denominators. Calculation of accurate ethnic-specific rates relies on the assumption that information on ethnicity is collected in a similar manner in both the numerator and the denominator, and that a single child will be identified similarly in each dataset. In New Zealand this has not always been the case, and in addition the manner of collecting information on ethnicity has varied significantly over time. Since 1996, however, there has been a move to ensure that ethnicity information is collected in a similar manner across all administrative datasets in New Zealand (Census, Hospital Admissions, Mortality, Births). The following section briefly reviews how information on ethnicity has been collected in national data collections since the early 1980s and the implications of this for the information contained in this report.

1981 Census and Health Sector Definitions

Earlier definitions of ethnicity in official statistics relied on the concept of fractions of descent, with the 1981 census asking people to decide whether they were fully of one ethnic origin (e.g. Full Pacific, Full Māori) or if of more than one origin, what fraction of that ethnic group they identified with (e.g. 7/8 Pacific + 1/8 Māori). When prioritisation was required, those with more than 50% of Pacific or Māori blood were deemed to meet the ethnic group criteria of the time [422]. A similar approach was used to record ethnicity in health sector statistics, with birth and death registration forms asking the degree of Pacific or Māori blood of the parents of a newborn baby/the deceased individual. For hospital admissions, ancestry-based definitions were also used during the early 1980s, with admission officers often assuming ethnicity, or leaving the question blank [423].

1986 Census and Health Sector Definitions

Following a review expressing concern at the relevance of basing ethnicity on fractions of descent, a recommendation was made to move towards self-identified cultural affiliation. Thus the 1986 Census asked the question “What is your ethnic origin?” and people were asked to tick the box or boxes that applied to them. Birth and death registration forms however, continued to use the “fractions of blood” question until 1995, making comparable numerator and denominator data difficult to obtain [422]. For hospital admissions, the move from an ancestry-based to a self-identified definition of ethnicity began in the mid-80s, although non-standard forms were used and typically allowed a single ethnicity only [423].

1991 Census and Health Sector Definitions

A review suggested that the 1986 ethnicity question was unclear as to whether it was measuring ancestry or cultural affiliation, so the 1991 Census asked two questions:

1. Which ethnic group do you belong to? (tick the box or boxes which apply to you)
2. Have you any NZ Māori ancestry? (if yes, what iwi do you belong to?)

As indicated above, however, birth and death registrations continued with ancestry-based definitions of ethnicity during this period, while a number of hospitals were beginning to use self-identified definitions in a non-standard manner [423].

1996 Census and Health Sector Definitions

While the concepts and definitions remained the same as for the 1991 census, the ethnicity question in the 1996 Census differed in that:

- The NZ Māori category was moved to the top of the ethnic categories



- The 1996 question made it more explicit that people could tick more than one box
- There was a new “Other European” category with 6 subgroups

As a result of these changes, there was a large increase in the number of multiple responses, as well as an increase in the Māori ethnic group in the 1996 Census [422]. Within the health sector, however, there were much larger changes in the way in which ethnicity information was collected. From late 1995, birth and death registration forms incorporated a new ethnicity question identical to that in the 1996 Census, allowing for an expansion of the number of ethnic groups counted (previously only Māori and Pacific) and resulting in a large increase in the proportion of Pacific and Māori births and deaths. From July 1996 onwards, all hospitals were also required to inquire about ethnicity in a standardised way, with a question that was compatible with the 1996 Census and that allowed multiple ethnic affiliations [423]. A random audit of hospital admission forms conducted by Statistics NZ in 1999, however, indicated that the standard ethnicity question had not yet been implemented by many hospitals. In addition, an assessment of hospital admissions by ethnicity over time showed no large increases in the proportions of Māori and Pacific admissions after the 1996 “change-over”, as had occurred for birth and death statistics, potentially suggesting that the change to a standard form allowing for multiple ethnic affiliations in fact did not occur. Similarities in the number of people reporting a “sole” ethnic group pre- and post-1996 also suggest that the way in which information on multiple ethnic affiliations was collected did not change either. Thus while the quality of information available since 1996 has been much better than previous, there remains some concern that hospitals continue to undercount multiple ethnic identifications and as a result, may continue to undercount Pacific and Māori peoples [423].

2001 Census and Health Sector Definitions

The 2001 Census reverted back to the wording used in the 1991 Census after a review showed that this question provided a better measure of ethnicity based on the current statistical standard [422]. The health sector also continued to use self-identified definitions of ethnicity during this period, with the *Ethnicity Data Protocols for the Health and Disability Sector* providing guidelines which ensured that the information collected across the sector was consistent with the wording of the 2001 Census (i.e. *Which ethnic groups do you belong to (Mark the space or spaces that apply to you)?*)

2006 Census and Health Sector Definitions

In 2004, the Ministry of Health released the *Ethnicity Data Protocols for the Health and Disability Sector* [424] with these protocols being seen as a significant step forward in terms of standardising the collection and reporting of ethnicity data in the health sector [425]. The protocols stipulated that the standard ethnicity question for the health sector was the 2001 Census ethnicity question, with respondents being required to identify their own ethnicity, and with data collectors being unable to assign this on respondent’s behalf, or to transfer this information from another form. The protocols also stipulated that ethnicity data needed to be recorded to a minimum specificity of Level 2 (see below) with systems needing to be able to store, at minimum, three ethnicities, and to utilise standardised prioritisation algorithms, if more than three ethnic groups were reported. In terms of outputs, either sole/combo, total response, or prioritised ethnicity needed to be reported, with the methods used being clearly described in any report [424].

The following year, Statistics New Zealand’s Review of the Measurement of Ethnicity (RME), culminated in the release of the *Statistical Standard for Ethnicity 2005* [426], which recommended that:

1. The 2006 Census ethnicity question use identical wording to the 2001 Census
2. Within the “Other” ethnic group, that a new category be created for those identifying as “New Zealander” or “Kiwi”. In previous years these responses had been assigned to the European ethnic group



3. All collections of official statistics measuring ethnicity have the capacity to record and report six ethnicity responses per individual, or at a minimum, three responses when six could not be implemented immediately
4. The practice of prioritising ethnicity to one ethnic group should be discontinued.

At the 2006 Census, however, a total of 429,429 individuals (11.1% of the NZ population) identified themselves as a New Zealander, with further analysis suggesting that 90% of the increase in those identifying as New Zealanders in 2006, had arisen from those identifying as New Zealand European at the 2001 Census [427]. In 2009 Statistics NZ amended the Standard to reflect these issues [428] with the current recommendation being that future Censuses retain the current ethnicity question (i.e. that New Zealander tick boxes not be introduced) but that alongside the current standard outputs where New Zealander responses are assigned to the Other Ethnicity category, an alternative classification be introduced which combines the European and New Zealander ethnic groups into a single European and Other Ethnicity category for use in time series analysis (with those identifying as both European and New Zealanders being counted only once in this combined ethnic group [428]).

The Current Recording of Ethnicity in New Zealand's National Datasets

In New Zealand's national health collections (e.g. National Minimum Dataset, Mortality Collection and NZ Cancer Registry), up to three ethnic groups per person are stored electronically for each event, with data being coded to Level 2 of Statistics New Zealand's 4-Level Hierarchical Ethnicity Classification System [413]. In this Classification System increasing detail is provided at each level. For example [424]:

- Level 1 (least detailed level) e.g. code 1 is European
- Level 2 e.g. code 12 is Other European
- Level 3 e.g. code 121 is British and Irish
- Level 4 (most detailed level) e.g. code 12111 is Celtic

Māori, however, are identified similarly at each level (e.g. Level 1: code 2 is Māori vs. Level 4: code 21111 is Māori).

For those reporting multiple ethnic affiliations, information may also be prioritised according to Statistics New Zealand's protocols, with Māori ethnicity taking precedence over Pacific > Asian/Indian > Other > European ethnic groups [424]. This ensures that each individual is counted only once and that the sum of the ethnic group sub-populations equals the total NZ population [423]. The implications of prioritisation for Pacific groups however are that the outcomes of those identifying as both Māori and Pacific are only recorded under the Māori ethnic group.

For those reporting more than 3 ethnic affiliations, the ethnic groups recorded are again prioritised (at Level 2), with Māori ethnicity taking precedence over Pacific > Asian/Indian > Other > European ethnic groups (for further details on the prioritisation algorithms used see [424]). In reality, however, less than 0.5% of responses in the National Health Index database have three ethnicities recorded, and thus it is likely that this prioritisation process has limited impact on ethnic-specific analyses [424].



Undercounting of Māori and Pacific Peoples in National Collections

Despite significant improvements in the quality of ethnicity data in New Zealand's national health collections since 1996, care must still be taken when interpreting the ethnic-specific rates presented in this report, as the potential still remains for Māori and Pacific children and young people to be undercounted in our national data collections. In a review that linked hospital admission data to other datasets with more reliable ethnicity information (e.g. death registrations and Housing NZ Corporation Tenant data), the authors of Hauora IV [429] found that on average, hospital admission data during 2000–2004 undercounted Māori children (0–14 years) by around 6%, and Māori young people by around 5–6%. For cancer registrations, the undercount was in the order of 1–2% for the same age groups. While the authors of Hauora IV developed a set of adjusters which could be used to minimise the bias such undercounting introduced when calculating population rates and rate ratios, these (or similar) adjusters were not utilised in this report for the following reasons:

1. Previous research has shown that ethnicity misclassification can change over time, and thus adjusters developed for one period may not be applicable to other periods [430].
2. Research also suggests that ethnic misclassification may vary significantly by DHB [430], and thus that adjusters developed using national level data (as in Hauora IV) may not be applicable to DHB level analyses, with separate adjusters needing to be developed for each DHB.

Further, as the development of adjusters requires the linkage of the dataset under review with another dataset for which more reliable ethnicity information is available, and as this process is resource-intensive and not without error (particularly if the methodology requires probabilistic linkage of de-identified data), the development of a customised set of period and age specific adjusters was seen as being beyond the scope of the current project. The reader is thus urged to bear in mind that the data presented in this report may undercount Māori and Pacific children to a variable extent (depending on the dataset used) and that in the case of the hospital admission dataset for Māori, this undercount may be as high as 5–6%.

Ethnicity Classifications Utilised in this Report and Implications for Interpretation of Results

Because of inconsistencies in the manner in which ethnicity information was collected prior to 1996, all ethnic-specific analyses presented in this report are for the 1996 year onwards. The information thus reflects self-identified concepts of ethnicity. In order to ensure that each health event is only counted once, prioritised ethnic group has been used unless otherwise specified.



APPENDIX 7: THE NZ DEPRIVATION INDEX

The NZ Deprivation Index (NZDep) is a small area index of deprivation, which has been used as a proxy for socioeconomic status in this report. The main concept underpinning small area indices of deprivation is that the socioeconomic environment in which a person lives can confer risks/benefits which may be independent of their own social position within a community [431]. They are thus aggregate measures, providing information about the wider socioeconomic environment in which a person lives, rather than about their individual socioeconomic status.

The NZDep was first created using information from the 1991 census, but has since been updated following each census. The NZDep2006 combines 9 variables from the 2006 census which reflect 8 dimensions of deprivation (**Table 105**). Each variable represents a standardised proportion of people living in an area who lack a defined material or social resource (e.g. access to a car, income below a particular threshold), with all 9 variables being combined to give a score representing the average degree of deprivation experienced by people in that area. While the NZDep provides deprivation scores at meshblock level (Statistics NZ areas containing approximately 90 people), for the purposes of mapping to national datasets, these are aggregated to Census Area Unit level (≈1,000–2,000 people). Individual area scores are then ranked and placed on an ordinal scale from 1 to 10, with decile 1 reflecting the least deprived 10% of small areas and decile 10 reflecting the most deprived 10% of small areas [432].

Table 105. Variables used in the NZDep2006 Index of Deprivation

No	Factor	Variables in Order of Decreasing Weight in the Index
1	Income	People aged 18–64 receiving means tested benefit
2	Employment	People aged 18–64 unemployed
3	Income	People living in households with income below an income threshold
4	Communication	People with no access to a telephone
5	Transport	People with no access to a car
6	Support	People aged <65 living in a single parent family
7	Qualifications	People aged 18–64 without any qualifications
8	Owned Home	People not living in own home
9	Living Space	People living in households below a bedroom occupancy threshold

The advantage of NZDep is its ability to assign measures of socioeconomic status to the elderly, the unemployed and to children (to whom income and occupational measures often don't apply), as well as to provide proxy measures of socioeconomic status for large datasets when other demographic information is lacking. Small area indices have limitations, however, as not all individuals in a particular area are accurately represented by their area's aggregate score. While this may be less of a problem for very affluent or very deprived neighbourhoods, in average areas, aggregate measures may be much less predictive of individual socioeconomic status [431]. Despite these limitations, the NZDep has been shown to be predictive of mortality and morbidity from a number of diseases in New Zealand.



APPENDIX 8: POLICE AREA BOUNDARIES

Most boundaries for the Police Areas in New Zealand map closely to District Health Board boundaries. **Figure 199** shows the District Health Boards as colour/shaded blocks, while Police Area boundaries are drawn as blue lines. Where there is a significant mismatch, the overlap is shown as being striped. **Table 106** provides an overview of the Police Areas that overlap the District Health Boards.

Figure 199. Police Area boundaries compared with District Health Board boundaries



Image sources: Police Areas (as at 14/08/2014): <https://koordinates.com/layer/3825-nz-police-area-boundaries/>; District Health Boards (as at 2/10/2014): <http://www.health.govt.nz/system/files/documents/pages/north-island.pdf> and <http://www.health.govt.nz/system/files/documents/pages/south-island.pdf>

Table 106. Overlap between District Health Boards and Police Areas

District Health Board	Police region	Police Area	District Health Board	Police region	Police Area
Northland	Northland	Far North Area	Tairāwhiti	Eastern	Tairāwhiti Area
Northland	Northland	Whangarei Area	Taranaki	Central	Taranaki Area
Waitemata	Waitemata	Auckland Motorways Area	Taranaki	Central	Taranaki Area
Waitemata	Waitemata	North Shore Area	Taranaki	Central	Whanganui Area
Waitemata	Waitemata	Rodney Area	Hawke's Bay	Eastern	Hawke's Bay Area
Waitemata	Waitemata	Waitakere Area	Hawke's Bay	Eastern	Tairāwhiti Area
Auckland	Auckland City	Auckland Central Area	MidCentral	Central	Manawatu Area
Auckland	Auckland City	Auckland East Area	Whanganui	Central	Whanganui Area
Auckland	Auckland City	Auckland West Area	Hutt Valley	Wellington	Hutt Valley Area
Counties Manukau	Counties/Manukau	Counties Manukau Central Area	Capital & Coast	Wellington	Kapiti-Mana Area
Counties Manukau	Counties/Manukau	Counties Manukau East Area	Capital & Coast	Wellington	Wellington Area
Counties Manukau	Counties/Manukau	Counties Manukau South Area	Wairarapa	Wellington	Wairarapa Area
Counties Manukau	Counties/Manukau	Counties Manukau West Area	Nelson Marlborough	Tasman	Marlborough Area
Waikato	Waikato	Hamilton City Area	Nelson Marlborough	Tasman	Nelson Bays Area
Waikato	Waikato	Waikato East Area	South Canterbury	Canterbury	Mid / South Canterbury Area
Waikato	Waikato	Waikato West Area	Canterbury	Tasman	Nelson Bays Area
Waikato	Bay of Plenty	Taupo Area	Canterbury	Canterbury	Central Canterbury Area
Waikato	Central	Whanganui Area	Canterbury	Canterbury	Mid / South Canterbury Area
Waikato	Central	Taranaki Area	Canterbury	Canterbury	Northern Canterbury Area
Bay of Plenty	Bay of Plenty	Eastern Bay of Plenty Area	Canterbury	Canterbury	Southern Canterbury Area
Bay of Plenty	Bay of Plenty	Rotorua Area	West Coast	Tasman	West Coast Area
Bay of Plenty	Bay of Plenty	Western Bay of Plenty Area	Southern	Southern	Dunedin Area
Lakes	Bay of Plenty	Rotorua Area	Southern	Southern	Otago Rural Area
Lakes	Bay of Plenty	Taupo Area	Southern	Southern	Southland Area

APPENDIX 9: METHODS USED TO DEVELOP THE CHILD POVERTY MONITOR

This appendix provides an overview of the methodology used to develop the Child Poverty Monitor that was used originally for the New Zealand Children's Social Health Monitor.

Rationale for the Child Poverty Monitor Indicators

The precursor to the Child Poverty Monitor was the Children's Social Health Monitor which arose from the work of a group of health professionals responding to the deteriorating economic conditions in New Zealand and Australia in the late 2000s. Coming from a range of organisations¹ with an interest in child health this Working Group was concerned about the impact of the recession on child wellbeing. The Group formed in early 2009 and discussed a set of indicators with which to monitor this impact: the types of indicators that might be included and the criteria by which individual indicators should be selected. As a result of these discussions, the Children's Social Health Monitor was developed, comprising two sets of indicators:

1. *To monitor prevailing economic conditions:* Ideally, indicators would capture different facets of economic wellbeing (e.g. in a recession several quarters of negative growth (*GDP*) may precede upswings in unemployment rates, which in turn will influence the number of children reliant on benefit recipients).
2. *To monitor children's wellbeing:* Ideally indicators would respond relatively quickly (e.g. months to small number of years) to family's adaptations to deteriorating economic conditions (e.g. hospitalisations for poverty-related conditions) and would provide an overview of family wellbeing from a variety of different perspectives.

The Expert Advisory Group: solutions to child poverty

In 2012, the Children's Commissioner established the Expert Advisory Group on Solutions to Child Poverty (EAG). He gave the EAG the task of providing him with realistic, pragmatic and effective solutions to address child poverty in the short term and in the longer term. In their report *Child Poverty in New Zealand: Evidence for Action* [3], the EAG recommended that governments adopt a strategic framework for addressing child poverty issues and ensuring accountability for outcomes. They stated that the framework should include the enactment of legislation requiring the measurement of child poverty, the setting of short and long term poverty reduction targets, and the establishment, monitoring and reporting of various child poverty related indicators [3].

Indicator Selection Criteria

The working group decided to gather good quality routinely collected data able to provide complete population coverage. This was to ensure the indicator set was methodologically robust and could be consistently monitored over time. A set of selection criteria were established against which candidate indicators were scored. The selection criteria included:

¹The Paediatric Society of New Zealand, the Population Child Health Special Interest Group of the Royal Australasian College of Physicians, the New Zealand Child and Youth Epidemiology Service, TAHA (the Well Pacific Mother and Infant Service), the Māori SIDS Programme, the Kia Mataara Well Child Consortium, the New Zealand Council of Christian Social Services, and academics from the Universities of Auckland and Otago



Conceptual Criteria

Criteria for Indicators to Monitor Prevailing Macroeconomic Conditions

1. Internationally recognised and reported measure of economic performance/wellbeing
2. Should impact on at least one facet of children's wellbeing (i.e. the pathway(s) via which it impacts on children's wellbeing should be relatively well understood, or an association between the indicator and wellbeing documented in the literature)
3. Likely to change in response to a recession (i.e. months to small number of years)

Criteria for Indicators to Monitor Children's Health and Wellbeing

1. The condition is likely to be influenced by family's physical adaptations to worsening economic conditions (e.g. saving on heating to pay for food, moving in with family to save on rent)
2. The condition is likely to be influenced by family's psychological adaptations to worsening economic conditions (e.g. increased family conflict in response to financial stress)
3. The condition exhibits a socioeconomic gradient (e.g. rates are higher in more deprived areas)
4. The condition is likely to respond to changing economic conditions in the short to medium term (e.g. months to 1–2 years)

Data Quality Criteria

Data Quality Criteria (for either of the above indicator categories)

1. Needs to be routinely collected
2. Available at the national level (i.e. complete coverage of target population)
3. Updated at least annually (although quarterly preferable)
4. Availability of consistent time series data going back several years (i.e. standard and stable method of data collection)
5. Distribution can be broken down by e.g. ethnicity, socioeconomic status, region

Selection of the Baseline Indicator Set

In mid-2009 a long list of candidate indicators (selected by means of a scan of the available literature, email consultation with child health networks, and the suggestions of Working Group members) were then scored against each of these criteria by Working Group members and other health professionals (n=20). Those scoring the indicators were also asked to select a Top Five Economic and Top Five Health and Wellbeing Indicators for inclusion in the Children's Social Health Monitor. The resulting Top Five Economic and Wellbeing indicators (as determined both by criteria scoring and priority ranking) were:

Economic Indicators:

- Gross Domestic Product
- Income Inequality
- Child Poverty
- Unemployment Rates
- The Number of Children Reliant on Benefit Recipients

Child Health and Wellbeing Indicators:

- Hospital Admissions with a Social Gradient
- Mortality with a Social Gradient
- Infant Mortality
- Hospital Admissions and Mortality from Non-Accidental Injury



Methodology for Developing the Hospital Admissions and Mortality with a Social Gradient Indicator

While the top five economic indicators and a number of the child health and wellbeing indicators already had established methodologies, the hospital admissions and mortality with a social gradient indicator had to be developed specifically for the Children's Social Health Monitor. The methodology used to develop this indicator is outlined below:

Hospital Admissions

In considering which conditions should be included in the analysis of hospital admissions with a social gradient, the 40 most frequent causes of hospital admission in children aged 0–14 years (excluding neonates) were reviewed, and those exhibiting a social gradient (a rate ratio of ≥ 1.8 for NZDep deciles 9–10 vs. deciles 1–2; or for Māori, Pacific or Asian vs. European children) were selected. A small number of conditions with rate ratios in the 1.5–1.8 range were also included, if they demonstrated a consistent social gradient (i.e. rates increased in a stepwise manner with increasing NZDep deprivation) and the association was biologically plausible (the plausibility of the association was debated by Working Group members).

Inclusion and Exclusion Criteria

Neonatal hospital admissions (<28 days) were excluded on the basis that these admissions are more likely to reflect issues arising prior to/at the time of birth (e.g. preterm infants may register multiple admissions as they transition from intensive care (NICU) → special care nurseries (SCBU) → the postnatal ward), and respiratory infections/other medical conditions arising in these contexts are likely to differ in their aetiology from those arising in the community.

For medical conditions, only acute and arranged hospital admissions were included, as Waiting List admissions are likely to reflect service capacity, rather than the burden of health need (e.g. the inclusion of Waiting List admissions would result in a large number of children with otitis media and chronic tonsillitis (who were being admitted for grommets and tonsillectomies) being included, and the demographic profile of these children may be very different from children attending hospital acutely for the same conditions).

For injury admissions, filtering by admission type was not possible, as a number of DHBs admitted injury cases under (now discontinued) ACC admission codes, making it difficult to distinguish between acute and waiting list admissions in this context. In accordance with other reports produced by the NZ Child and Youth Epidemiology Service (NZCYES), all injury cases with an Emergency Department Specialty Code (M05–M08) on discharge were excluded as a result of inconsistent uploading of Emergency Department cases across DHBs (see **Appendix 3** for further detail). This differential filtering however means that it is not possible to accurately compare the magnitude of the social gradients between the medical condition and injury categories, as they were derived using different methodologies (and social differences in Emergency Department vs. primary care attendances for minor medical conditions may have accounted for some of the social gradients seen). No such differential filtering occurred for mortality data, however (see below), and thus the magnitude of the social differences seen in this context is more readily comparable.



Mortality

In the case of mortality, because in many instances, the number of deaths from a particular condition was insufficient to calculate reliable rate ratios by NZDep and ethnicity, the rate ratios derived from the analysis of hospital admission data were used to denote category membership. The most frequent causes of mortality in those 0–14 years (excluding neonates) were reviewed however, in order to ensure that no additional conditions making a large contribution to mortality had been missed by the analysis of hospital admission data. This identified two further conditions (which by analysis of mortality of data met rate ratio criteria); deaths from drowning and Sudden Unexpected Death in Infancy, which were then included in the coding algorithms (for both hospital admissions and mortality data). A number of deaths were also identified, which were attributed to issues arising in the perinatal period (e.g. extreme prematurity, congenital anomalies), but in order to preserve consistency with previous exclusion criteria (i.e. the exclusion of conditions arising in the perinatal period) these were not included in coding algorithms.



APPENDIX 10: DIAGNOSTIC SHIFTS IN CODING

In New Zealand, the Ministry of Health regularly updates the ICD-10-AM coding system it uses to assign diagnostic codes, in order to ensure New Zealand remains congruent with international best practice. As a consequence, since 2000 New Zealand's national health collections have sequentially used the ICD-10-AM 1st, 2nd, 3rd and 6th Editions, with the 6th Edition being in use since 1 July 2008 [413].

While the Technical Report's coding algorithms take such Edition changes into account, what is often harder to identify is changes in the way the codes themselves are assigned, either as a result of new directives to clinical coders on how to document specific conditions, or due to changes in the way clinicians diagnose clinically overlapping, ambiguous, or emerging conditions. In this Technical Report, two changes have been made to the coding algorithms previously used by the CSHM to define medical conditions with a social gradient, as a result of these issues. Specifically these changes relate to:

The Broadening of Asthma to Asthma and Wheeze

In recent years there has been a move away from diagnosing asthma in pre-school age children, with the majority of a European Respiratory Society Taskforce in 2008 "*agreeing not to use the term asthma to describe preschool wheezing illness, since there is insufficient evidence to show that the pathophysiology of preschool wheezing illness is similar to that of asthma in older children [433]*".

Figure 200 shows the large increases in hospital admissions with a primary diagnosis of wheeze (R062) that have occurred in New Zealand since this time, with almost all of these increases being in preschool aged children (0–4 years). A corresponding fall in the number of children admitted with asthma (J45–J46) has also occurred during 2010–2012, with the largest changes again being seen in pre-school age children.

As a consequence, in this year's Technical Report, Asthma (J45–J46) has been replaced with a new category, Asthma and Wheeze (J45–J46, R062), in order to minimise the impacts of this probable diagnostic shift on time series analysis.

The Addition of J22 (Unspecified Lower Respiratory Infections)

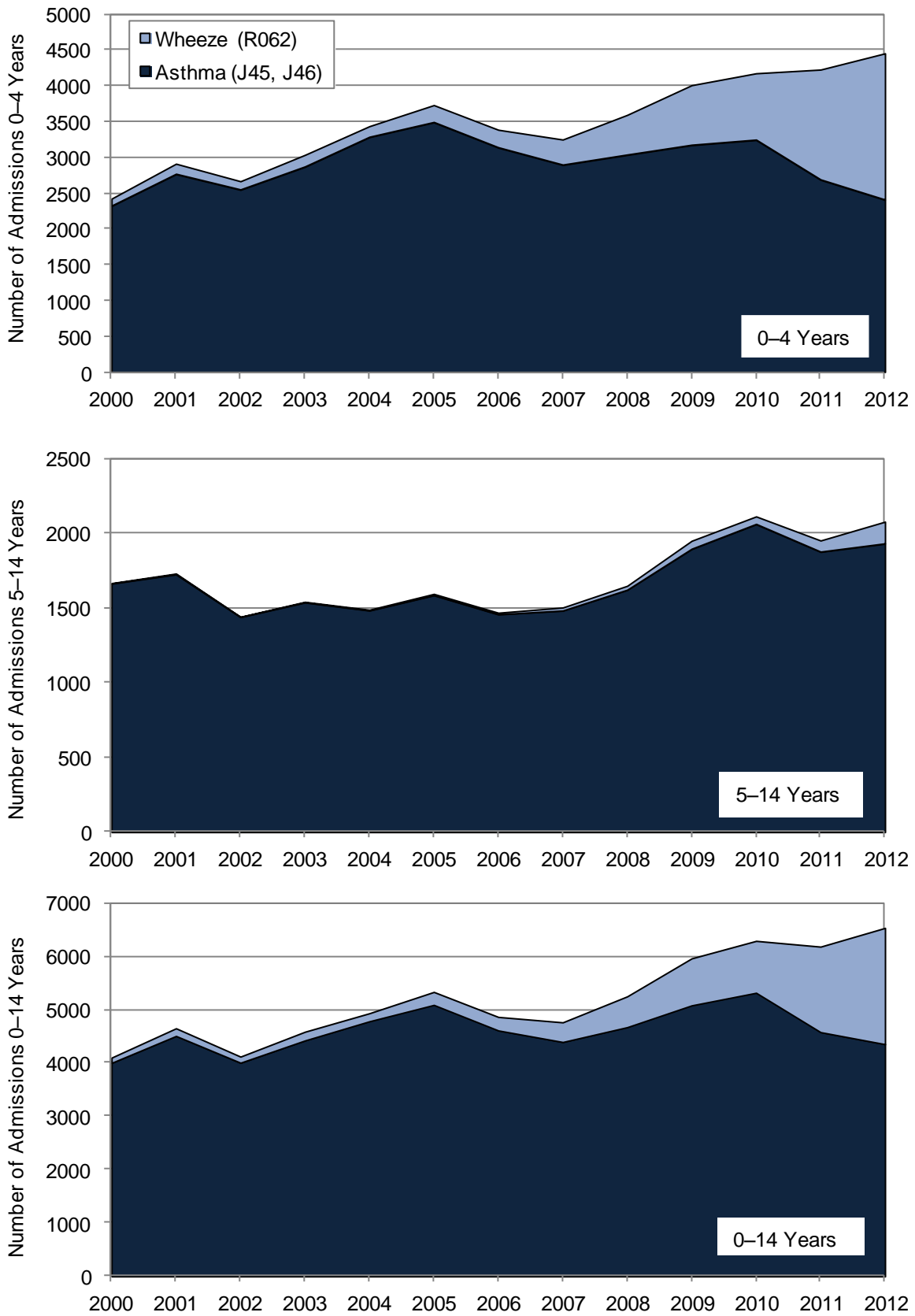
J22 was not initially included in the CSHM's coding algorithms, as it was not present in ICD-9, and thus could not be used in time series analyses prior to 2000. However, there are considerable clinical similarities between J22 (Unspecified Lower Respiratory Tract Infection) and J18.9 (Unspecified Pneumonia), a code which accounts for the majority of admissions in the Monitor's current Bacterial/Non-Viral/Unspecified Pneumonia category.

Whether this diagnostic overlap has resulted in any actual diagnostic transfer between these categories remains unclear, although the number of admissions with a primary diagnosis of J22 has increased since 2007, while the number with Bacterial/Non-Viral/Unspecified Pneumonia has declined since 2009 (**Figure 201**).

Given this uncertainty, the code J22 has been added to the Technical Report's coding algorithms. As a result, the rates presented in this report are not directly comparable to those previously presented in the CSHM.



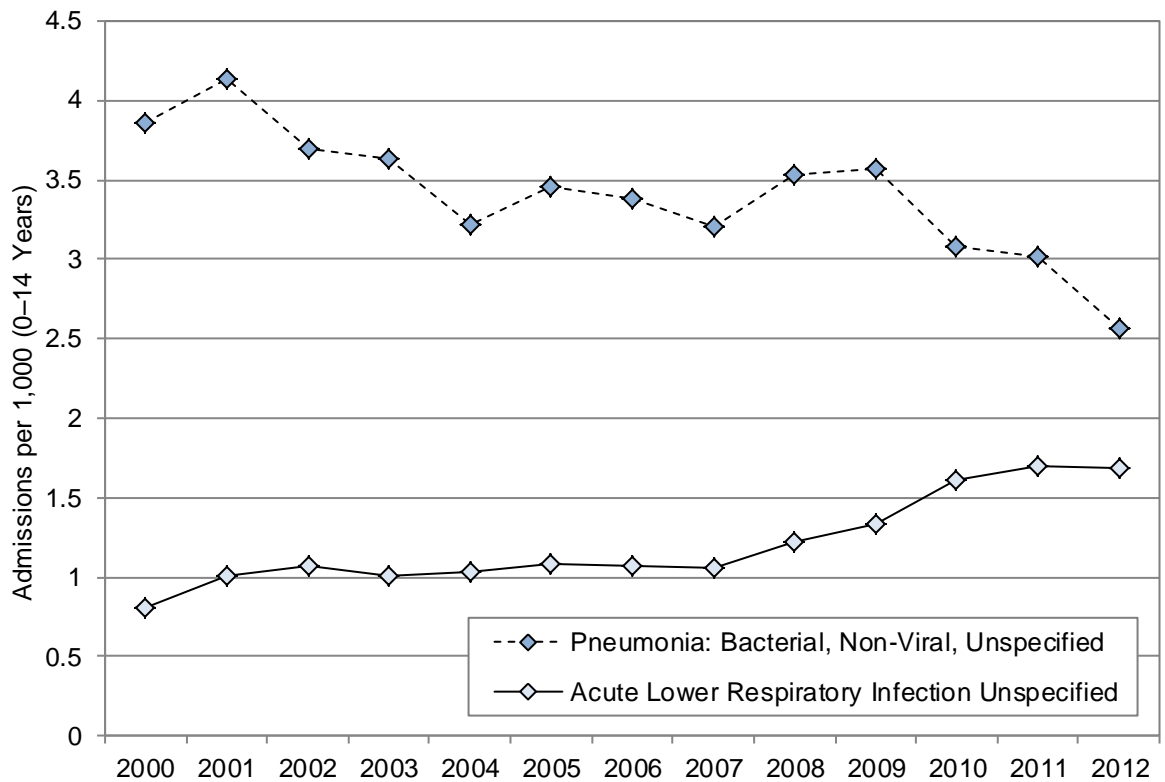
Figure 200. Diagnostic shifts in the coding of asthma and wheeze by age group for children aged 0–14 years, New Zealand 2000–2012



Source: National Minimum Dataset



Figure 201. Hospital admissions for bacterial/non-viral/unspecified pneumonia and acute unspecified lower respiratory infections in children aged 0–14 years, New Zealand 2000–2012



Source: Numerator: National Minimum Dataset (neonates removed); Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Acute and arranged admissions only



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