

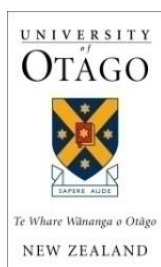
TE OHONGA AKE



THE DETERMINANTS OF HEALTH FOR
MĀORI CHILDREN AND YOUNG PEOPLE
IN NEW ZEALAND

Te Ohonga Ake

The Determinants of Health for Māori Children and Young People in New Zealand



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This report was produced as the result of a contract between the Ministry of Health and the Paediatric Society of New Zealand, with the report being written by the New Zealand 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.

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Te Ohonga Ake

The literal translation of Te Ohonga Ake is the Awakening. In the context of this report it refers to an awakening towards the reality of Māori child and youth health status in New Zealand. While many of us have been acutely aware of poor outcomes for Māori children and young people in this country, this report confirms our concerns and provides strong evidence for everyone to wake up, pay attention and take action to improve the lives of our most precious asset, our mokopuna.

Cover Artwork: *Whakapapa* – Family Tree by Coree Te Whata-Colley

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INTRODUCTION AND OVERVIEW

REPORT CONTEXT

Background

Last year's report on the *Health Status of Māori Children and Young People in New Zealand* [1] highlighted the excess burden of ill health experienced by many Māori children and young people. Recent research suggests that, in addition to being preventable, unnecessary and a breach of children's rights, such inequalities result in significant costs to our society [2].

In 2012 the Māori Affairs Committee commissioned an inquiry into the determinants of wellbeing for Māori children [3]. The Select Committee received a large number of submissions, many of which outlined the importance of the socioeconomic determinants of health to the wellbeing of Māori children and their whānau. Such determinants included family income, education, housing, primary and preventative health services, and nutrition [4]. The findings of the Māori Affairs Committee's Inquiry were released on 20 December 2013 with the Government's response to the report expected in April 2014.

Report Aims

With these issues in mind, this report aims to:

1. Explore some of the underlying determinants of health for Māori children and young people.
2. Assist those working in the health sector to consider the roles other agencies (such as Education, Child Youth and Family, the Police) play in influencing child and youth wellbeing
3. Assist Ministry of Health and District Health Board staff to use all of the available evidence when developing programmes and interventions to improve the health of Māori children and young people.



REPORT STRUCTURE

Reporting Cycle and Companion Publications

This report is the third of a three-part series on the health of Māori children and young people. The series repeats over a three year reporting cycle as follows:

Year 1	Māori Children and Young People with Chronic Conditions and Disabilities
Year 2	The Health Status of Māori Children and Young People
Year 3	The Determinants of Health for Māori Children and Young People

This Year 3 report is based on an *Indicator Framework* [5] common to all NZ Child and Youth Epidemiology Service reports. The report sits alongside a report focused on the total population, and entitled *The Determinants of Health for Children and Young People in New Zealand* [6]. Each section in the total population report concludes with a brief overview of local policy documents and evidence-based reviews that consider population-level approaches to prevention or management. Such overview tables are useful for those contemplating the next steps in addressing the issue under review.

At the end of each chapter of this report, the authors have summarised the relevant findings from the total population report (see the grey New Zealand Distribution box). The New Zealand Distribution box lets readers know how whether the full report has context that will help with understanding the distribution of the underlying determinants of health for Māori children and young people.

Report Sections and Indicators

In exploring the underlying determinant of health for Māori children and young people, each of the indicators in this year's report has been assigned to one of four sections:

1. **The Wider Macroeconomic and Policy Context:** This section considers the wider economic and policy environment as a determinant of health. Indicators include: gross domestic product, income inequality, unemployment, child poverty and living standards, children reliant on benefit recipients and young people reliant on benefits.
2. **Socioeconomic and Cultural Determinants:** This section is divided into two parts. The first considers factors related to household composition, including children living in sole parent households, and household crowding. The second considers education as a determinant of health. Indicators in this sub-section include: early childhood education, enrolments in kura kaupapa Māori, educational 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 also divided into two parts. The first covers indicators relevant to the Well Child/Tamariki Ora Schedule, including immunisation coverage and uptake of Well Child/Tamariki Ora contacts (via Plunket). The second part covers a range of indicators associated with substance use, including smoking in pregnancy, exposure to second-hand cigarette smoke, smoking in young people, and alcohol-related harm.
4. **Health Outcomes as Determinants:** This section is divided into three parts. The first considers hospital admissions and mortality from a range of socioeconomically sensitive conditions. The second part considers Māori children and young people's exposure to family violence and assault. Indicators include: 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. Part three looks at mental health. Indicators include Māori children and young people's access to mental health services, and suicide and self-harm.

In addition, a Viewpoint by Dr Bev Lawton, beginning on **Page 101**, pulls together some of the key themes from these sections in an independent opinion piece entitled *A Good Start In Life: Maximising Systems And Clinical Practice Around Our Whānau*.

Ethnicity Coding, Data Quality Issues and the Signalling of Statistical Significance

When the authors prepared this report, high quality data were not always available in areas of public health importance. In a number of cases, the authors have opted to use data of lesser quality, in order to ensure that such issues do not fall below the public health radar. The cautions on interpretation that accompany each indicator will give readers a better understanding of the strengths and weaknesses of the data used. The text box below outlines a number of more specific data quality issues.

Ethnicity Coding and the Ethnicity Classifications Used in this Report

All of the ethnic specific analyses presented in this report are from 1996 onwards, and thus reflect self-identified concepts of ethnicity (see **Appendix 5** for a more detailed review). In New Zealand's national health collections, up to 3 ethnic groups are stored electronically for each event [7]. However, inconsistencies in the way ethnicity information was collected before 1996 mean the data cannot easily be compared. Further, unless otherwise specified, this report uses total response ethnicity to identify ethnicity. That is, the term Māori refers to those children and young people identifying as Māori in any of their first three ethnic groups. The term non-Māori non-Pacific refers to those children and young people who did not identify as being either Māori or Pacific in any of their first three ethnic groups.

Note: The non-Māori reference group is often used in the Health Sector for rate ratio comparisons. However, the Te Ohonga Ake Advisory Group selected the non-Māori non-Pacific reference group on the basis that, as a group, these children and young people had the lowest documented exposures to health disparities.

Undercounting of Māori in National Health Collections

When reviewing the hospital admission data in sections that follow, the reader must bear in mind that none of the ethnic specific rates have been adjusted for undercounting. The rate ratios presented may, therefore, underestimate, to a variable extent, the magnitude of any ethnic inequalities present. Despite significant improvements in the quality of ethnicity data since 1996, national data collections may still undercount Māori children and young people. The authors of *Hauora Māori Standards of Health IV* [8] linked hospital admission and cancer registry data to other more reliable data sources. They found that, on average, hospital admission data during 2000–2004 undercounted Māori children by 6%, and Māori young people by 5–6%. For cancer registrations, the undercount was in the order of 1–2% (see **Appendix 5**).

Education Data

The education data in this report compares Māori and European students, rather than Māori and non-Māori non-Pacific students, as this was the format in which we received the data from the Ministry of Education.

Signalling of Statistical Significance and Other Data Quality Issues

As in previous reports, **Appendix 1** outlines the rationale for the use of statistical significance testing in this report and **Appendix 2** to **Appendix 4** contain information on the data sources used to develop each indicator. Readers are urged to be aware of the contents of these Appendices when interpreting any information in this report. (Note: As outlined in **Appendix 1**, we have signalled in the text whether we have used tests of statistical significance in a particular section, 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).



REPORT KEY FINDINGS

Common themes emerging from the data

A number of common themes emerge from the data examined for this report.

Firstly, this year's data reflects the challenging economic conditions seen nationally. Māori unemployment rose during 2008 and 2009 and did not return to pre-recession levels during 2011 and early 2012. The number of Māori young people reliant on unemployment and sickness benefits did decline between April 2011 and 2012. However, the number of Māori young people reliant on unemployment, domestic purposes and sickness benefits still remains much higher than in 2008.

Secondly, many health and education indicators reflect the social gradient. Admission rates for medical conditions and injuries influenced by social factors both remain much higher for Māori than for non-Māori non-Pacific children. However, hospital admissions for both declined during 2010 and 2011 (after two years of increases for medical admissions). Educational outcomes also display on-going ethnic differences, with a lower proportion of Māori than European students leaving school with a University Entrance Standard. Exposure to household crowding and to cigarette smoke in-utero and during childhood remains much higher for Māori than for non-Māori non-Pacific children.

Finally, patterns of access to mental health services are complex. For Māori young people, and particularly for Māori children, indicators may not reflect the level of need, but rather the patterns of access to mental health services. For example, Māori children access mental health services for conditions such as attention deficit hyperactivity disorder and autism/pervasive development disorders at much lower rates than for non-Māori non-Pacific children. Similarly, Māori young people access mental health services for depression, anxiety disorders and eating disorders at much lower rates than non-Māori non-Pacific young people. In contrast, Māori young people access mental health services for schizophrenia and other psychotic disorders at a much higher rate than non-Māori non-Pacific young people.

Concluding Comments

This report aims to provide an overview of the underlying determinants of health for Māori children and young people, and to assist those working in the health sector to consider some of the other agencies influencing Māori child and youth wellbeing.

Such an intersectoral focus is necessary, as addressing the inequalities in health experienced by many Māori children and young people is beyond of the scope of the health sector alone. However, collaborations with organisations such as Housing New Zealand to improve the quality of housing stock, or Child Youth and Family to identify children at risk of non-accidental injury, may provide more tangible starting points. Further, some of the integrated policy responses outlined in the companion report on the *Determinants of Health for Children and Young People in New Zealand* [6], if implemented, may result in significant health gains for Māori children and young people.

Thus as previously, one of the key roles of the health sector remains on-going advocacy, to ensure that each Māori child and/or young person is able to grow up to reach their full potential.

Overview of the indicators in this report

Table 1 (next page) provides an overview of the distributions and trends in this year's report.

Table 1. Overview of the Determinants of Health for Māori Children and Young People in New Zealand

Stream	Indicator	Distribution and Trends for Māori Children and Young People
Section 1: The Wider Macroeconomic and Policy Context		
Macroeconomic Indicators	GDP	<ul style="list-style-type: none"> Changes in GDP are often used as a measure of economic growth; a recession is defined as two consecutive quarters of negative growth. New Zealand entered a recession at the end of June 2008 (after two consecutive quarters of negative growth). New Zealand left the recession at the end of September 2009, when growth increased to 0.3%. Except for a brief decline in the September quarter of 2010 (-0.1%), GDP has remained positive since October 2009. GDP increased by 0.6% in the June quarter of 2012. Economic activity for the year ending June 2012 increased by 2.0%, compared to the year ending June 2011.
	Income Inequality	<ul style="list-style-type: none"> Income equality is measured by the P80/P20 ratio and Gini coefficient. In New Zealand during 1982–2011, income inequality was higher after adjusting for housing costs. Housing costs make up a greater proportion of income for lower income than for higher income households. The most rapid rises in income inequality occurred in the late 1980s and early 1990s. While income inequality also rose during 1994–2004, the rate of increase was slower. During 2004–2007, income inequality fell, a decline potentially attributable to the Working for Families package. During 2009–2011, income inequality was volatile, possibly due to differences in when and how much the global financial crisis and associated economic downturn affected different parts of the income distribution. One or two more surveys may be needed to see where the inequality trend will settle after the impacts of the global financial crisis.
	Child Poverty	<ul style="list-style-type: none"> The NZ Household Economic Survey (via Perry [9]) reports only limited analyses by ethnic group because of the relatively small sample sizes for Māori, Pacific and Other ethnic groups. In the Survey, poverty rates for Māori children were consistently higher than for European children. During 2010–2012, using the after housing costs (AHC) 60% fixed-line measure, around 34% of Māori children lived in poor households, compared to 17% of European children.
	Living Standards	<ul style="list-style-type: none"> In the 2008 Living Standards Survey, 39% of Māori children aged 0–17 years scored four or more on the composite deprivation index, which measures a range of “enforced lacks”. In addition, 59% of children whose family’s income source was a benefit had scores of four or more. Those children who scored four or more on the composite deprivation index had much higher exposures to household economising behaviours. Such behaviours include 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.

Stream	Indicator	Distribution and Trends for Māori Children and Young People
Macroeconomic Indicators	Unemployment	<ul style="list-style-type: none"> • In the second quarter of 2012, the seasonally adjusted unemployment rate rose to 6.8%, while seasonally adjusted unemployment numbers increased from 160,000 in 2012(Q1) to 162,000 in 2012(Q2). • During 2008(Q1)–2012(Q2) unemployment rates were consistently higher for Māori than for Asian/Indian and European people. • Unemployment rates among Māori increased during 2008 and 2009, but became more static during 2010(Q1)–2012(Q2), with rates during 2012(Q2) being 12.8% for Māori vs. 5.2% for European people.
	Children Reliant on Benefit Recipients	<ul style="list-style-type: none"> • No breakdown by ethnicity is available for this indicator. The Ministry of Social Development does not collect information on the ethnicity of children reliant on benefit recipients (only the ethnicity of the benefit recipient is recorded). However, unemployment trends suggest the economic downturn may have disproportionately impacted on Māori, which means national trends in benefit uptake are of relevance to Māori children. • In New Zealand, the proportion of children 0–18 years reliant on a benefit recipient fell from 24.9% in April 2000 to 17.5% in April 2008, before increasing again to 20.4% in 2011. By April 2012, 20.1% of all New Zealand children relied on a benefit recipient. • A large part of the initial decline was due to a fall in children reliant on unemployment benefit recipients (from 4.5% of children in 2000, to 0.5% in 2008). This percentage increased again to 1.4% in 2011 and 1.2% in 2012). • The proportion of children reliant on DPB recipients also fell (from 17.2% of children in 2000, to 13.8% in 2008; and back up to 15.8% in 2011 and 15.7% in 2012). The rate of decline was much slower than for the unemployment benefit. • At the end of April 2012, the proportion of children reliant on benefit recipients was highest for those 0–4 years of age.
	Young People Reliant on Benefits	<ul style="list-style-type: none"> • During April 2000–2012, domestic purposes benefit uptake was higher for Māori than for non-Māori non-Pacific young people. Both ethnic groups experienced a decline in benefit uptake during the mid-2000s, followed by an upswing in rates after 2008. By April 2012, 100.0 per 1,000 Māori and 20.5 per 1,000 non-Māori non-Pacific young people relied on a domestic purposes benefit. • During April 2000–2012, unemployment benefit uptake was also higher for Māori than for non-Māori non-Pacific young people. Both ethnic groups experienced a marked decline in rates during the early to mid-2000s, followed by an upswing in rates after 2008. By the end of April 2012, however, rates had again fallen to 47.9 per 1,000 for Māori and 17.8 per 1,000 for non-Māori non-Pacific young people. • During April 2000–2012, sickness and invalid's benefit uptake was higher for Māori than for non-Māori non-Pacific young people. Invalid's and sickness benefit uptake increased for both ethnic groups during the 2000s, although these increases began to taper off during 2011 and 2012, particularly for the sickness benefit. By April 2012, invalid's benefit uptake was 15.9 per 1,000 for Māori and 12.7 per 1,000 for non-Māori non-Pacific young people. Sickness benefit uptake was 24.6 per 1,000 for Māori and 12.9 per 1,000 for non-Māori non-Pacific young people.

Stream	Indicator	Distribution and Trends for Māori Children and Young People
Section 2: Socioeconomic and Cultural Determinants		
Household Composition	Children in Sole-Parent Households	<ul style="list-style-type: none"> In New Zealand during 2006, 42.6% of Māori children lived in sole-parent households, compared to 18.4% of non-Māori non-Pacific children. In 2006, the proportion of Māori children in sole-parent households increased with increasing deprivation, as measured on the New Zealand Deprivation Index (NZDep). The highest rates were in households in the most deprived (NZDep decile 10) areas. At each level of deprivation, the proportion of Māori children in sole-parent households was higher than for non-Māori non-Pacific children. The proportion of Māori children living in sole-parent households also varied by DHB, with rates ranging from 30.1% in South Canterbury to 46.9% in Counties Manukau and Tairāwhiti. Within each DHB, the proportion of Māori children in sole-parent households was <i>significantly</i> higher than for non-Māori non-Pacific children.
	Household Crowding	<ul style="list-style-type: none"> In New Zealand during 2006, the proportion of Māori children and young people living in crowded households (that is requiring one or more additional bedrooms) was <i>significantly</i> higher than for non-Māori non-Pacific children. 17.6% of Māori children and young people aged 0–24 years lived in households requiring one additional bedroom, while 10.2% lived in households requiring two or more additional bedrooms. The proportion of Māori children and young people living in crowded households increased with increasing NZDep deprivation. The highest rates were in households in the most deprived (NZDep decile 10) areas. At each level of NZDep deprivation, a higher proportion of Māori than non-Māori non-Pacific children and young people lived in crowded households. The proportion of Māori children and young people in crowded households also varied by DHB, with rates ranging from 38.9% in Counties Manukau to 11.7% in South Canterbury. Within each DHB, household crowding was <i>significantly</i> higher for Māori than for non-Māori non-Pacific children and young people.
Education: Knowledge and Skills	Early Childhood Education (ECE)	<ul style="list-style-type: none"> During 2000–2011, the types of ECE most frequently used by Māori children were education and care, Te Kōhanga Reo and kindergartens. The overall number of enrolments in ECE for Māori children increased by 36.3% during this period. Changes varied by service type, with enrolments in education and care increasing by 114.1% and enrolments in kindergartens by 6.3%. In contrast, enrolments in Te Kōhanga Reo decreased by 17.0%. The proportion of Māori new entrants reporting participation in ECE prior to school entry increased from 83.6% in 2001 to 90.0% in 2011. The most rapid increases occurred during the early 2000s. Throughout this period, prior participation in ECE remained lower for Māori than for European children. In June 2011, the proportion of Māori children attending ECE prior to school entry increased as the deprivation of the school's catchment area decreased. The highest rates were seen in children attending schools in the least deprived (decile 10) areas. Within each school socioeconomic decile, the proportion of Māori children previously attending ECE was lower than for European children. During 2011, the proportion of Māori children attending ECE prior to school entry varied by DHB, with rates ranging from 81.7% in Counties Manukau to 95.8% in Canterbury.

Stream	Indicator	Distribution and Trends for Māori Children and Young People
Education: Knowledge and Skills	Enrolments in Te Kōhanga Reo and Kura Kaupapa Māori	<ul style="list-style-type: none"> The number of enrolments in licensed Te Kōhanga Reo declined from 10,389 in 2002, to 9,165 in 2008, before increasing again to 9,631 in 2011. A number of children also attended Ngā Puna Kōhungahunga and licence-exempt Te Kōhanga Reo during this period. In New Zealand since 1992, the number of kura kaupapa Māori and kura teina has increased 4.5-fold, from 13 in 1992, to 72 in 2011. The most dramatic increases occurred in the 1990s, however, with the rate of growth flattening off after 2003.
	Educational Attainment at School Leaving	<ul style="list-style-type: none"> During 2009–2011, the proportion of Māori students leaving school with no qualifications declined, from 38.2% to 31.4%. The proportion leaving with a University Entrance (UE) standard increased, from 18.4% in 2009 to 23.4% in 2011. The proportion of Māori students leaving with no qualifications, however, remained higher than for European students during this period, while the proportion leaving with a UE standard remained lower. During 2011, the proportion of Māori students achieving a UE standard increased with increasing school socioeconomic decile. At each level of socioeconomic deprivation, however, a lower proportion of Māori than European students attained a UE standard. During 2011, the proportion of Māori students leaving school with no qualifications also varied by DHB, with rates ranging from 16.0% in the Wairarapa, to 34.4% in Counties Manukau. Similarly, the proportion of Māori students leaving school with a UE standard ranged from 15.3% in the West Coast, to 35.7% in Auckland DHB.
	Senior Secondary School Retention	<ul style="list-style-type: none"> 2009–2011 saw an increase in the proportion of Māori students staying on at school until at least 17 years, from 60.8% in 2009 to 64.7% in 2011. Throughout this period, the proportion of Māori students staying on at school until at least 17 years remained lower than for European students. During 2011, the proportion of Māori students staying on at school until at least 17 years of age varied by DHB, with rates ranging from 52.8% on the West Coast, to 79.2% in South Canterbury. Ethnic differences in school retention at 17 years need to be viewed in the context of the alternative educational opportunities available to students. During 2001–2010, a large number of Māori students participated in tertiary education. Participation was particularly high in Certificate Level 1–3 courses. While participants included those 25+ years, such figures suggest that, for many, formal education does not cease at school leaving. However, different types of study attract different income premiums when completed. An assessment of the longer-term impacts educational participation has on economic security needs to consider such differences.
	Stand-Downs, Suspensions, Exclusions and Expulsions	<ul style="list-style-type: none"> Stand-down rates for Māori students increased during the early to mid-2000s, reached a peak in 2006 and then declined. Rates during 2000–2011 remained higher than for European students. In contrast, suspension rates for Māori students declined throughout 2000–2011, falling from 19.1 per 1,000 in 2000, to 11.4 per 1,000 in 2011. Suspension rates were also higher for Māori than for European students throughout this period. Exclusion and expulsion rates for Māori students also exhibited a general downward trend. Exclusion rates fell from 6.4 per 1,000 in 2000, to 4.5 per 1,000 in 2011. Expulsion rates fell from 5.2 per 1,000 in 2000, to 2.8 per 1,000 in 2011. Throughout this period, exclusion and expulsion rates were higher for Māori than for European students.

Stream	Indicator	Distribution and Trends for Māori Children and Young People
Education: Knowledge and Skills	Truancy and Unjustified Absences	<ul style="list-style-type: none"> In New Zealand, total unjustified absences in Māori students fell from 4.8 per week per 100 students in 2006, to 4.0 per week per 100 students in 2011. Frequent truancy fell from 2.8 per 100 students in 2006, to 2.0 per 100 students in 2011. Both measures remained higher for Māori than for European students during these periods. During 2011, total unjustified absences in Māori students varied by DHB. Rates ranged from 2.6 per week per 100 students in Nelson Marlborough and the Southern DHB, to 5.5 per week per 100 students in Northland. Frequent truancy ranged from 0.6 per 100 students in South Canterbury, to 4.8 per 100 students in Tairāwhiti.
Section 3: Risk and Protective Factors		
Well Child/Tamariki Ora Services	Immunisation Coverage	<ul style="list-style-type: none"> Immunisation coverage rates at each milestone age (6, 12, 18, 24 months and 5 years) increased for both Māori and non-Māori non-Pacific children from 2009 (Q2) to 2012 (Q2). Coverage rates at each milestone age remained higher for non-Māori non-Pacific children than for Māori children during this period. However, the magnitude of these differences at 24 months, and to a lesser extent at 12 and 18 months, decreased. By 2012 (Q2), coverage at 24 months was 92.2% for Māori vs. 92.7% for non-Māori non-Pacific children. During 2012 (Q2), immunisation coverage rates in Māori children at 24 months varied with DHB, with rates ranging from 83.4% in Northland to 96.7% in the Hawke's Bay.
	Well Child Visits: Plunket Well Child Data	<ul style="list-style-type: none"> In New Zealand during July 2007–June 2012, a lower proportion of Māori than non-Māori non-Pacific babies received their Core 1 contact. The proportion of Māori Plunket babies (aged 2 weeks to 5 weeks 6 days) receiving their Core 1 contact increased from 69.0% to 78.6%. Rates for non-Māori non-Pacific babies increased from 77.6% to 85.0%. In the cohort of Plunket children born during July 2007–June 2008, a lower proportion of Māori than non-Māori non-Pacific children received their Core 1–7 contacts. Among Māori children, the Core 1 and 7 contacts were the least likely to be received, while the Core 2–5 contacts were the most likely to be received. In the same cohort, a higher proportion of Māori children from the least deprived (NZDep decile 1) areas received their Core 1–6 contacts than did Māori children from the most deprived (NZDep decile 10) areas. Differences by NZDep decile were less evident for the Core 7 contact.
Substance Use	Smoking in Pregnancy	<ul style="list-style-type: none"> In New Zealand during 2009–2010, 16.3% of Māori babies were born to mothers not registered with a LMC at the time of delivery. This proportion was <i>significantly</i> higher than for non-Māori non-Pacific babies (12.1%). However, many of these babies' mothers may have accessed hospital-based maternity services, making it difficult to estimate the proportion receiving no antenatal care during pregnancy. The mother's smoking status was not recorded at first LMC registration for 16.0% of Māori babies recorded in the National Maternity Collection (NMC). Of babies whose mothers' smoking status was known, 61.9% had a non-smoking mother, 23.2% had a mother who smoked 10 or fewer cigarettes a day, and 14.9% had a mother who smoked 10+ cigarettes a day. The mothers of Māori babies, regardless of maternal age, had higher smoking rates at first LMC registration than the mothers of non-Māori non-Pacific babies. The highest smoking rates in both ethnic groups were seen among mothers in their teens and early twenties. The proportion of Māori babies whose mothers smoked at first LMC registration varied by DHB. Rates ranged from 21.2% for babies in the Auckland DHB, to 47.9% for babies in the Bay of Plenty (unknown smoking status excluded from the denominator). In each DHB, with the exception of the West Coast, maternal smoking rates for Māori babies were <i>significantly</i> higher than for non-Māori non-Pacific babies.

Stream	Indicator	Distribution and Trends for Māori Children and Young People
Substance Use	Second-Hand Cigarette Smoke Exposure: Maternal Smoking 2 Weeks After Delivery	<ul style="list-style-type: none"> In New Zealand during 2009–2010, 20.5% of Māori babies did not have their mother's smoking status at two weeks after delivery recorded in the National Maternity Collection (NMC). Of babies whose mother's smoking status was known, 64.3% had a non-smoking mother, 21.9% had a mother who smoked less than 10 per day and 13.8% had a mother who smoked 10 or more per day. The mothers of Māori babies, regardless of maternal age, had higher smoking rates at two weeks after delivery than the mothers of non-Māori non-Pacific babies. The highest smoking rates in both ethnic groups were among mothers in their teens and early twenties. The proportion of Māori babies whose mothers smoked at two weeks after delivery varied by DHB. Maternal smoking rates (unknown smoking status excluded from denominator) ranged from 19.4% for babies in the Auckland DHB, to 46.8% for babies in Tairāwhiti. In each DHB, with the exception of the West Coast, maternal smoking rates for Māori babies were <i>significantly</i> higher than for non-Māori non-Pacific babies.
	Second-Hand Cigarette Smoke Exposure: Second-Hand Cigarette Smoke in the Home	<ul style="list-style-type: none"> During 2001–2010, parental smoking rates for 14–15 year old Māori students declined (65.9% in 2001 to 62.7% in 2010. These declines were statistically <i>significant</i> during 2006–2010. Parental smoking rates for European students did not change significantly during 2006–2010, although rates did fall from 34.1% in 2001 to 31.6% in 2010. Throughout this period, parental smoking rates remained higher for Māori students than for European students. The proportion of 14–15 year old students living in homes where people smoked inside also declined. For Māori students, rates declined from 47.5% in 2001 to 31.7% in 2010. For European students, rates declined from 27.1% to 16.1%. Declines for both ethnic groups were significant during 2006–2010. Throughout this period, the proportion of Māori students living in homes where people smoked inside remained higher than for European students.
	Tobacco Use in Young People: Action on Smoking in Health (ASH) Surveys	<ul style="list-style-type: none"> In New Zealand during 1999–2011, daily smoking rates for Māori 14–15 year old students declined. Rates fell from 36.3% in 1999 to 12.3% in 2011 for Māori females and from 23.6% to 7.8% for Māori males. Daily smoking rates for Māori females remained higher than for Māori males during this period. Rates for Māori students of both genders remained higher than for European students.
	Tobacco Use in Young People: 2009 NZ Tobacco Use Survey	<ul style="list-style-type: none"> In the 2009 NZ Tobacco Use Survey, current smoking rates for Māori females aged 15–19 years (47.1% 95% CI 33.4–60.7) were higher than for Māori males (29.2% 95% CI 16.7–44.5). However, differences between Māori females and males did not reach statistical significance. Current smoking rates for Māori young people collectively (RR 2.15 95% CI 1.62–2.67) however, were <i>significantly</i> higher than for New Zealand young people. Smoking rates for young Māori females were also <i>significantly</i> higher than for young NZ females.

Stream	Indicator	Distribution and Trends for Māori Children and Young People
Substance Use	Alcohol-Related Hospital Admissions	<ul style="list-style-type: none"> In New Zealand during 2007–2011, alcohol was listed as a contributory cause in a large number of hospital admissions in Māori young people aged 15–24 years. However, only 6.3% of alcohol related admissions had acute intoxication or the toxic effects of alcohol listed as the primary diagnosis. In 37.3% of cases, an injury was the primary diagnosis, with head and upper limb injuries being prominent. In addition, 38.4% of admissions had a mental health condition (including alcohol dependence) listed as the primary diagnosis, with schizophrenia being the most frequent mental health diagnosis recorded. Finally 7.0% of alcohol related admissions had poisoning by other drugs or substances listed as the primary reason for admission. 54.7% of alcohol-related admissions in Māori young people had an external cause of injury recorded. Of all alcohol-related admissions, 9.4% were associated with an assault and 8.7% with self-harm. A further 7.2% were for injuries sustained while the young person was the occupant of a car, with the majority occurring as the result of a car colliding with a stationary object, or overturning. Finally, 6.5% were associated with a fall and 10.7% with inanimate mechanical forces. Alcohol-related admission rates were <i>significantly</i> higher for Māori than for non-Māori non-Pacific young people. Rates for Māori young people were relatively static during the early to mid-2000s, but increased gradually after 2006–07.
Section 4: Health Outcomes as Determinants		
Socioeconomically Sensitive Hospital Admissions and Mortality	Hospital Admissions and Mortality with a Social Gradient	<ul style="list-style-type: none"> During 2007–2011, bronchiolitis, asthma and skin infections made the largest individual contributions to hospitalisations for medical conditions with a social gradient in Māori children. Infectious and respiratory diseases collectively were responsible for the majority of admissions. Falls, followed by injuries due to inanimate mechanical forces, were the leading causes of injury admissions with a social gradient. Hospitalisations for medical conditions and injuries with a social gradient were <i>significantly</i> higher for Māori than for non-Māori non-Pacific children. Hospitalisations for medical conditions for Māori children were relatively static during the mid-2000s, but increased in 2007–2009, before declining again in 2010–2011. Rates for non-Māori non-Pacific children declined during the mid-2000s, but increased again in 2007–2010. While injury admissions with a social gradient declined for both ethnic groups during 2000–2011, the rate of decline was faster for non-Māori non-Pacific children than for Māori children. Thus ethnic differences were greater in 2011 than they were in 2000. During 2005–2009, SUDI was the leading cause of mortality with a social gradient in Māori children aged 0–14 years. Vehicle occupant-related deaths made the largest contribution to injury-related deaths, followed by pedestrian injuries and drowning, while bacterial/non-viral pneumonia was the leading cause of mortality from medical conditions. Mortality from medical conditions and injuries with a social gradient were both <i>significantly</i> higher for Māori children than for non-Māori non-Pacific children during 2005–2009.
	Infant Mortality: Neonatal and Post Neonatal Mortality	<ul style="list-style-type: none"> During 2005–2009, extreme prematurity was the leading cause of neonatal mortality in Māori infants, although congenital anomalies, other perinatal conditions and SUDI also made a contribution. SUDI was the leading cause of post-neonatal mortality, followed by congenital anomalies. Neonatal and post-neonatal mortality were both <i>significantly</i> higher for Māori infants than for non-Māori non-Pacific infants. On average during 2005–2009, 63.0 Māori infants each year died in the neonatal period while 65.4 died in the post neonatal period.

Stream	Indicator	Distribution and Trends for Māori Children and Young People
Socioeconomically Sensitive Hospital Admissions and Mortality	Infant Mortality: SUDI	<ul style="list-style-type: none"> During 2005–2009, mortality from SUDI was <i>significantly</i> higher for Māori infants than for non-Māori non-Pacific infants. On average during this period, 39 Māori infants each year died as the result of SUDI.
Safety and Family Violence	Injuries Arising from the Assault, Neglect or Maltreatment of Children	<ul style="list-style-type: none"> During 2007–2011, admissions for injuries arising from assault, neglect or maltreatment were <i>significantly</i> higher for Māori children aged 0–14 years than for non-Māori non-Pacific children. Admission rates for Māori children increased during the mid-2000s, but then declined during 2010–2011. In contrast, admissions for non-Māori non-Pacific children declined for the majority of 2000–2011. Admissions in Māori children exhibited a U-shaped distribution with age, with the highest rates being seen in infants less than one year. Admissions were less frequent during mid-childhood, but increased again after 11 years of age. Among Māori children who were hospitalised with injuries sustained as the result of assault, neglect or maltreatment during 2007–2011, traumatic subdural haemorrhages were the most frequently assigned primary diagnosis, followed by superficial head injuries. Head injuries as a group accounted for 63.7% of admissions.
	Injuries Arising from Assault in Young People	<ul style="list-style-type: none"> Among Māori young people hospitalised as the result of an assault during 2007–2011, fractures of the lower jaw were the most frequent primary diagnosis assigned, followed by fractures of the wrist and hand. Head and upper limb injuries accounted for 81.8% of admissions. Admissions for injuries arising from assault were <i>significantly</i> higher for Māori than for non-Māori non-Pacific young people, with admissions for both ethnic groups remaining relatively static during 2000–2011. Admissions for injuries arising from assault exhibited a J shaped distribution with age, with rates being high in Māori infants under one year, but then decreasing during childhood. Rates then increased rapidly amongst those in their mid to late teens, to reach a peak at 19 years of age.
	Child Youth and Family (CYF) Notifications	<ul style="list-style-type: none"> In New Zealand during 2011, CYF offices received 150,747 care and protection notifications, with 38.4% requiring further assessment. While this was an increase since 2004, when 40,939 notifications were received, the proportion requiring further assessment declined (86.3% required further assessment in 2004). The number of notifications requiring further assessment, however, continued to increase, from 35,350 in 2004 to 57,949 in 2011, an increase of 63.9% over this period. Of notifications which were assessed further during 2004–2011, a large proportion resulted in no abuse being found. Where abuse was found, physical and emotional abuse, and neglect were prominent. The most frequent non-abuse findings were behavioural and relationship difficulties. During the 2011 financial year, 45.6% of notifications were for Māori children and young people, while 32.0% were for European, 11.4% were for Pacific, and 1.9% were for Asian children and young people.

Stream	Indicator	Distribution and Trends for Māori Children and Young People
Safety and Family Violence	Police Family Violence Investigations	<ul style="list-style-type: none"> While no information was available by ethnicity, of the 86,704 Police family violence investigations which occurred in New Zealand during 2011, children were present or usually residing with the victim in 54.0%. During 2011, Police recorded 35,536 family violence investigations where an offence occurred, and where the relationship between the offender and the victim was recorded. In 40.6% of cases, the victim was the spouse or partner of the offender. In a further 24.4%, the victim and offender had been either previously married or in a relationship. In 20.3% of cases a parent/child relationship existed between the offender and the victim. During 2011, injuries were reported in 16.3% of Police family violence investigations. The most common injuries were minor bruising (9.5%), cuts (3.4%) and serious bruising (1.2%). In 893 cases (1.0%) a hospital attendance was required, and 20 cases (0.02%) resulted in a death. Police family violence investigations during 2011 resulted in 39,935 offences being disclosed. A very high proportion of these offences related to assaults, with property damage, breach of violence orders, and threatening behaviour also making a contribution.
Mental Health	Access to Mental Health Services: Childhood	<ul style="list-style-type: none"> In New Zealand during 2009–2011, attention deficit hyperactivity disorder (ADHD) was the most frequent diagnosis assigned to Māori children accessing mental health services. Second and third were conduct/disruptive behaviour disorders and parent-child relational problems. However, many children with these diagnoses access paediatric outpatients, and this workload is not captured by the Project for the Integration of Mental Health Data (PRIMHD) database used in this analysis. The rates presented are therefore likely to underestimate the prevalence of these conditions in the community. During 2009–2011, the number of Māori children accessing mental health services with the diagnoses of ADHD, parent child relational problems, autism/pervasive developmental disorders, or learning disorders were <i>significantly</i> lower than for non-Māori non-Pacific children. Similar ethnic differences were seen for mental health service contacts and inpatient bed nights. The number of Māori children accessing mental health services with a diagnosis of conduct/disruptive behaviour disorder was similar to that of non-Māori non-Pacific children. However, the number of mental health service contacts for Māori children with this diagnosis was <i>significantly</i> higher than for non-Māori non-Pacific children. The number of Māori children accessing mental health services with a diagnosis of an intellectual disability was similar to that of non-Māori non-Pacific children. However, the number of mental health service contacts and inpatient bed nights for Māori children with this diagnosis was <i>significantly</i> higher than for non-Māori non-Pacific children.
	Access to Mental Health Services: Late Childhood and Adolescence	<ul style="list-style-type: none"> A number of mental health diagnoses become increasingly common during late childhood and early adolescence. During 2009–2011, these included anxiety disorders, stress reaction/adjustment disorders and eating disorders. During 2009–2011, the number of Māori children and young people accessing mental health services with anxiety and eating disorders was <i>significantly</i> lower than for non-Māori non-Pacific children and young people. A similar pattern was seen for mental health service contacts and inpatient bed nights. The number of Māori children and young people accessing mental health services with stress reaction/adjustment disorders was also <i>significantly</i> lower than for non-Māori non-Pacific children and young people. However, the number of mental health service contacts for Māori with these diagnoses was similar to that of non-Māori non-Pacific children and young people, while the number of inpatient bed nights was <i>significantly</i> higher.

Stream	Indicator	Distribution and Trends for Māori Children and Young People
Mental Health	Access to Mental Health Services: Late Adolescence	<ul style="list-style-type: none"> • During 2007–2011, the most common reason for hospital admissions with mental health diagnoses in Māori young people was schizophrenia, followed by schizotypal/delusional disorders. Composite categories such as drug and alcohol-related conditions also made a significant contribution. • During 2009–2011, schizophrenia and other psychotic disorders, depression, bipolar disorder and other mood disorders and personality disorders became increasingly common during late adolescence. • The number of Māori young people accessing mental health services with schizophrenia, other psychotic disorders and bipolar disorder was <i>significantly</i> higher than for non-Māori non-Pacific young people. Similar patterns were seen for mental health contacts and inpatient bed nights. • The number of Māori young people accessing mental health services with depression and other mood disorders was <i>significantly</i> lower than for non-Māori non-Pacific young people. Similar patterns were seen for mental health service contacts. However, the number of inpatient bed nights accessed by Māori with depression was <i>significantly</i> higher than for non-Māori non-Pacific young people. The number of inpatient bed nights accessed by Māori with other mood disorders was <i>significantly</i> lower. • The number of Māori young people accessing mental health services with a personality disorder was not <i>significantly</i> different from that of non-Māori non-Pacific young people. While similar patterns were seen for the number of mental health service contacts, the number of inpatient bed nights was <i>significantly</i> higher for Māori with personality disorders than for non-Māori non-Pacific young people. • The number of Māori young people accessing mental health services with alcohol, cannabis and other substance-related disorders was <i>significantly</i> higher than for non-Māori non-Pacific young people. Similar patterns were seen for mental health contacts and inpatient bed nights.
	Self-Harm and Suicide	<ul style="list-style-type: none"> • During 2007–2011, hospital admissions for intentional self-harm were <i>significantly</i> higher for Māori than for non-Māori non-Pacific young people, although the magnitude of these differences was not large. On average, there were 143 admissions for intentional self-harm each year amongst Māori young people during this period. • During 2005–2009, suicide mortality rates were also <i>significantly</i> higher for Māori than for non-Māori non-Pacific young people, with on average 36 Māori young people each year dying as a result of suicide. • During 2007–2011, admissions for intentional self-harm increased rapidly after 12 years of age, with the highest rates being seen amongst those in their mid to late teens. During this period, the distribution by age was very similar for Māori and non-Māori non-Pacific young people. • Mortality from suicide during 2005–2009 increased more slowly during the teenage years, with the highest rates being seen amongst those in their late teens. At every age from 12 years onwards, suicide mortality was higher for Māori than for non-Māori non-Pacific young people. • Suicide mortality for Māori young people increased during the early 2000s, reached a peak in 2004–05 and then declined, while rates for non-Māori non-Pacific young people were more static.



THE WIDER MACROECONOMIC AND POLICY CONTEXT



MACROECONOMIC INDICATORS

GROSS DOMESTIC PRODUCT (GDP)

Introduction

The following section briefly reviews changes in New Zealand's GDP since March 2006, with a view to assessing the wider economic context within which Māori whānau are living.

Background

Gross Domestic Product (GDP) is defined as “the total market value of goods and services produced within a given period, after deducting the cost of goods utilised in the process of production” [10]. GDP is often used as a measure of the size of the 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 [10], with a recession typically being defined as two consecutive quarters of negative growth [11]. Recessions are often characterised by high unemployment, stagnant wages and a fall in retail sales, and though usually not lasting longer than a year [11], they may have significant implications for child wellbeing. New Zealand entered a recession at the end of June 2008 (after two consecutive quarters of negative growth), and left the recession at the end of September 2009 (when growth had increased to 0.3% [12]).



Data Source and Methods

Definition

Gross Domestic Product (GDP): Percent Change from Previous Quarter

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. A recession is defined as two consecutive quarters of negative growth (as measured by GDP).

Data Source

Statistics New Zealand: The New Zealand System of National Accounts. Produced Quarterly

Notes on Interpretation

Three approaches can be used to calculate GDP:

- *Production Approach:* This method 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.
- *Income Approach:* This approach measures the incomes received by the owners of the factors of production. These represent the returns to the labour and capital employed such as wages and salaries, and profits.
- *Expenditure Approach:* This method sums the values of all final demands, that is, final consumption expenditures (of households, government and private non-profit institutions serving households), changes in inventories, gross capital formation, and net exports.

Conceptually, both the production and expenditure approaches of measuring GDP are the same. However, as each series uses independent data and estimation techniques, some differences between the alternative measures arise. The expenditure approach series has historically shown more quarterly volatility and is more likely to be subject to timing and valuation problems. For these reasons, the production-based measure is the preferred measure for short-term quarter-on-quarter and annual changes [12]

New Zealand Trends

Production-based Measure of GDP

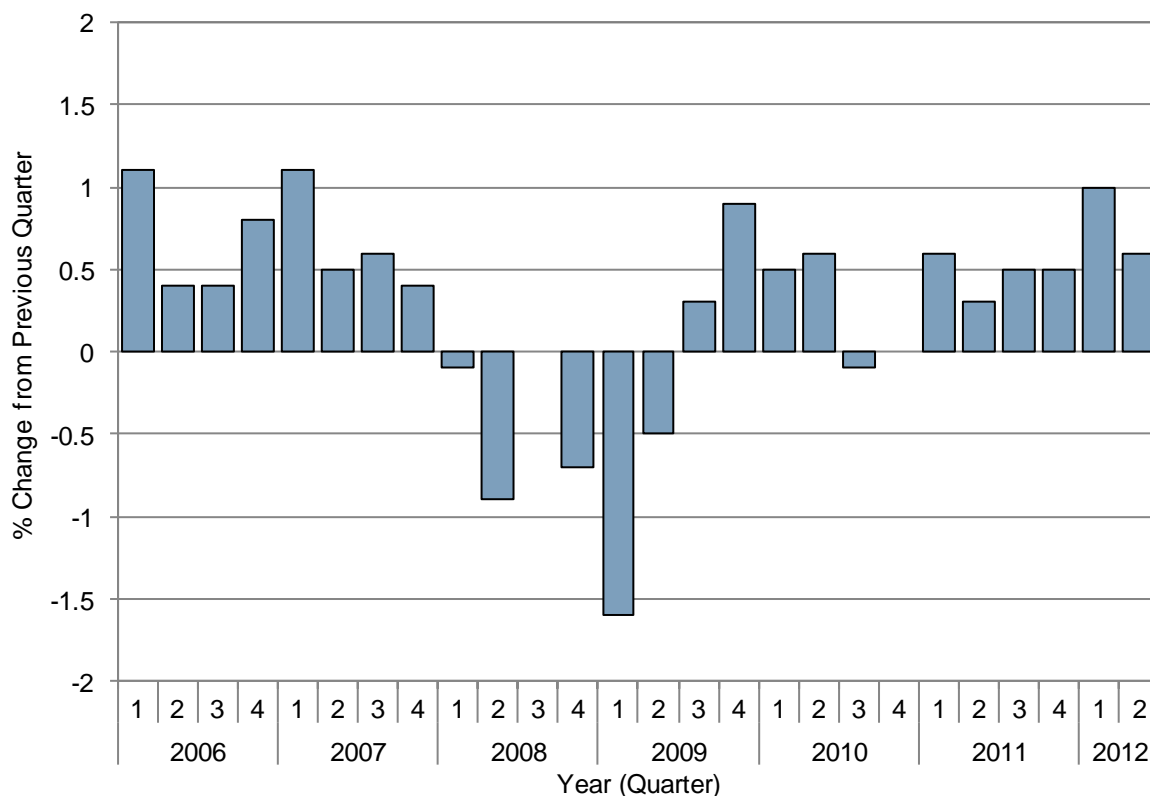
In New Zealand, GDP was either flat or decreased for six consecutive quarters from March 2008 to June 2009, before increasing again, for four consecutive quarters, from September 2009 to September 2010. GDP then briefly declined by 0.1% in the September quarter of 2010 and then remained static for a quarter, before increasing again, by 0.6% in the March quarter of 2011. Six consecutive quarters of growth were then seen, with GDP increasing by 0.6% in the June quarter of 2012 (**Figure 1**). Economic activity for the year ending June 2012 increased by 2.0%, when compared to the year ending June 2011 [12]

During the June 2012 quarter, agriculture (up 4.7%) was the largest contributor to economic growth, although construction (up 3.3%) and manufacturing (up 0.8%) also increased [12].

Expenditure-based Measure of GDP

The expenditure-based measure of GDP, released concurrently with the production-based measure, increased by 0.3% in the June quarter of 2012. During this period, household consumption expenditure increased by 0.2%, while export volumes were down 1.2% and imports were down 2.9%. On an annual basis, expenditure on GDP for the year ending June 2012 increased by 1.7%, when compared to the year ending June 2011 [12].

Figure 1. Gross Domestic Product (GDP): Percentage Change from Previous Quarter, New Zealand March Quarter 2006 to June Quarter 2012



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

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

The Determinants of Health for Children and Young People in New Zealand [6] contains an overview of local policy documents and evidence-based reviews which are relevant to the social policy environment and the socioeconomic determinants of child and youth health.

INCOME INEQUALITY

Introduction

The following section explores income inequalities in New Zealand since 1982 using two different measures, the P80/P20 Ratio and the Gini Coefficient. While a breakdown of these measures is not available by ethnicity, it is likely that income inequalities play a significant role in shaping the economic environments within which Māori whānau live and work.

Background

There has been much debate regarding the influence of income inequality on population health. While it is widely acknowledged that poverty plays a crucial role in shaping health disparities, authors such as Wilkinson and Marmot [13] argue that income inequality itself also plays a role, via its links to psychosocial pathways associated with relative disadvantage. In their view, it is not absolute material deprivation which shapes health at the population level, but rather the effects such inequalities have on psychosocial outcomes such as the degree of control over work, anxiety, depression and social affiliations. Others such as Lynch [14] however, would argue that it is not the psychological effects of income inequality which play the greatest role, but rather the lack of material resources (e.g. differentials in access to adequate nutrition, housing and healthcare), coupled with a systematic underinvestment in human, physical, health and social infrastructure (e.g. the types and quality of education, health services, transportation, recreational facilities and public housing available) that have the greatest impact [15].



Data Source and Methods

Definition

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 2012 [9].

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 methodology used see Perry 2012 [9].

Note 2: In February 2014, Treasury and Statistics NZ advised that there had been an error in the calculation of household incomes, which impacted on the calculation of the P80/20 Ratio and the Gini Coefficient for the 2010–2012 years [16]. The figures presented here, which have been revised to include the corrected data, may differ from those presented in previous NZCYES reports.

Notes on Interpretation

P80/P20Ratio: When individuals are ranked by equivalised household income and then divided into 100 equal groups, each group is called a percentile. If the ranking starts with the lowest income, then 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 ratio of the value at the top of the 80th percentile to the value at the top of the 20th percentile is called the P80/20 ratio and is often used as a measure of income inequality (e.g. a P80/20 ratio of 3.0 indicates that those at the top of the 80th percentile have incomes 3.0x higher than those at the top of the 20th percentile). In general, the higher the ratio, the greater is the level of inequality [9].

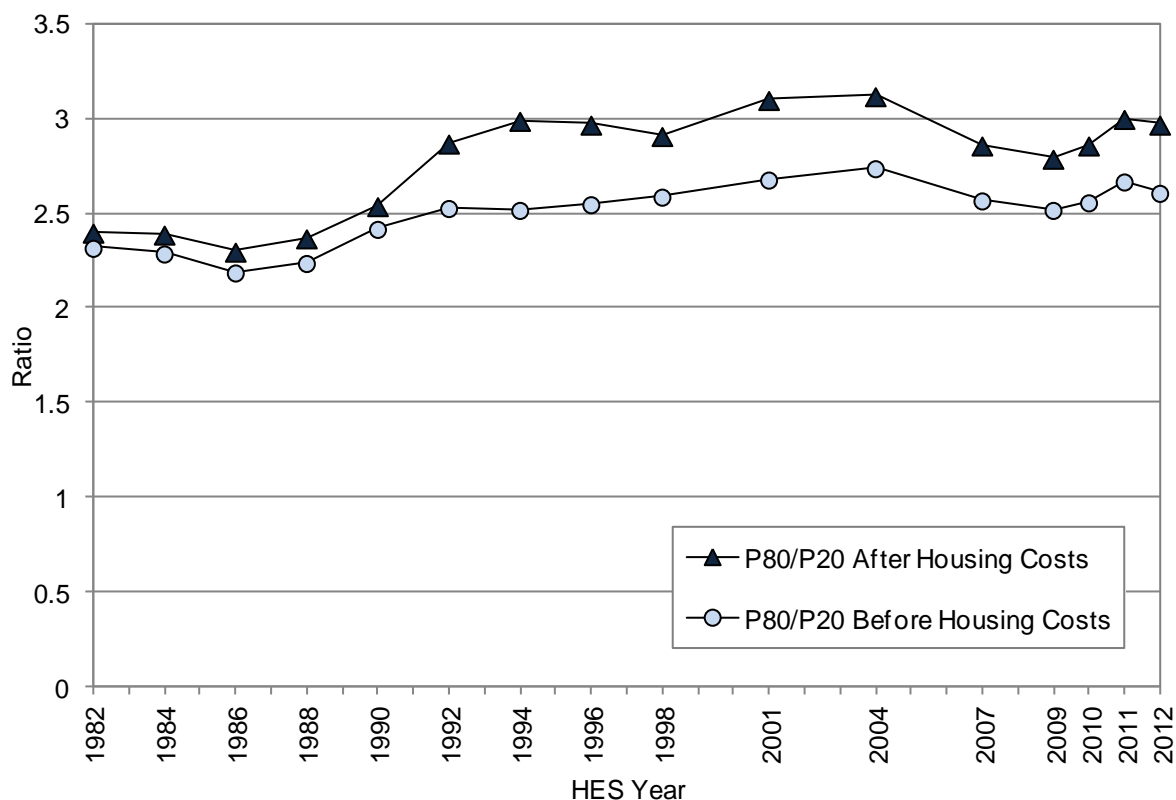
Gini Coefficient: The Lorenz curve is a graph with the horizontal axis showing the cumulative % of people in a population ranked by their income. The vertical axis shows the corresponding cumulative % of equivalised disposable household income (i.e. the graph shows the income share of any selected cumulative proportion of the population). The diagonal line represents a situation of perfect equality (i.e. all people having the same income). The Gini coefficient is derived from the Lorenz curve and is the ratio of the area between the actual Lorenz curve and the diagonal (or line of equality), compared to the total area under the diagonal. When the Gini coefficient = 0 all people have the same level of income. When it approaches 1, one person receives all the income (i.e. it is an overall measure of income inequality: the higher the number, the greater the level of inequality) [17]. 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 [18].

New Zealand Trends

Income Inequality: P80/P20 Ratio

In New Zealand during 1982–2012 income inequality, as measured by the P80/P20 ratio, was higher after adjusting for housing costs, as housing costs generally make up a greater proportion of household income for lower income than for higher income households. The most rapid rises in income inequality occurred during 1988–1992. While income inequality also rose during 1994–2004, the rate of increase was slower. During 2004–2007, income inequality fell, a decline which Perry attributes to the Working for Families package. During 2009–2011 the impact of the economic downturn and global financial crisis 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 [9] [16] (**Figure 2**).

Figure 2. Income Inequality in New Zealand as Assessed by the P80/P20 Ratio for the 1982–2012 HES Years

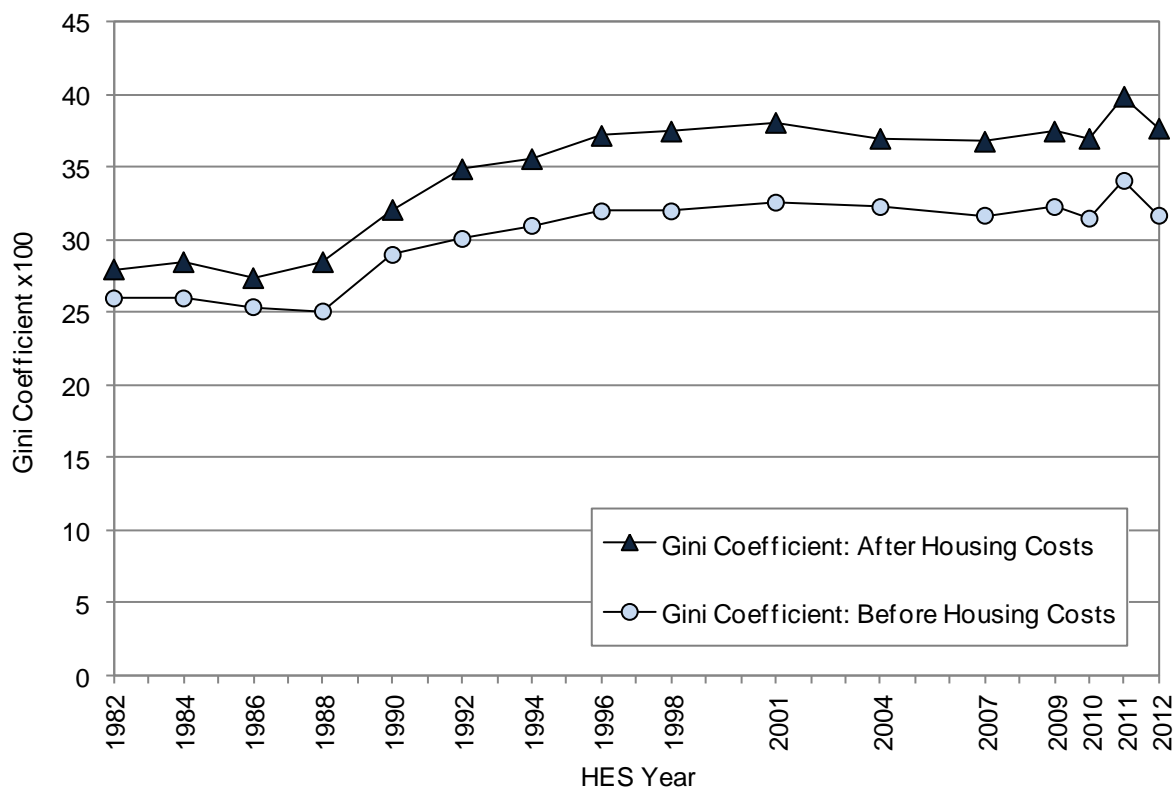


Source: Perry 2014 [16] derived from Statistics NZ Household Economic Survey (HES) 1982–2012

Income Inequality: Gini Coefficient

In New Zealand during 1982–2012 income inequality, as measured by the Gini coefficient, was also 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 2009–2012, 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 [9] [16] (**Figure 3**).

Figure 3. Income Inequality in New Zealand as Assessed by the Gini Coefficient for the 1982–2012 HES Years



Source: Perry 2014 [16] derived from Statistics NZ Household Economic Survey (HES) 1982–2012

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

The Determinants of Health for Children and Young People in New Zealand [6] contains an overview of local policy documents and evidence-based reviews which are relevant to the social policy environment and the socioeconomic determinants of child and youth health.

CHILD POVERTY AND LIVING STANDARDS

Introduction

In New Zealand, the Ministry of Social Development has periodically reviewed the socioeconomic wellbeing of families with children using information from two data sources:

1. The NZ Household Economic Survey, which can be used to assess the proportion of families with children who live below the income poverty line [9].
2. The NZ Living Standards Surveys, which use the Economic Living Standards Index (NZELSI) to assess the proportion of families with children who live in severe or significant hardship [19].

The following section uses information from these two data sources to assess the proportion of Māori children living below the 60% poverty threshold, or in families exposed to much reduced living standards.

Children Living in Households Below the Poverty Line

The Ministry of Social Development publishes an annual report on household incomes using information from the NZ Household Economic Survey (NZHES). In these reports, authored by Bryan Perry [9] only limited analyses by ethnic group are reported, because of the relatively small sample sizes for Māori, Pacific and Other ethnic groups in the survey data. The following section reviews the limited amount of information available on the proportion of Māori children and young people aged 0–17 years living in households with incomes below the 60% income poverty threshold, as well as more detailed information on a range of demographic factors of relevance to Māori children and young people.

Data Source and Methods

Definition

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

Data Source

Statistics New Zealand Household Economic Survey (NZHES n=2,800–3,500 households per survey) via Perry 2012 [9]. Note: Child Poverty measures are reported on by the Ministry of Social Development using NZHES data [9] which was available 2-yearly from 1982–1998, and 3-yearly thereafter. Since 2007, income data has become available annually through the new HES Incomes Survey. The full NZHES (including expenditure data) however remains 3-yearly. For more detail on methodology see Perry 2012 [9].

Note: In February 2014, Treasury and Statistics NZ advised that there had been an error in the calculation of household incomes, which impacted on child poverty rates for 2010–2012 [16]. At the time of writing, revised data was not available for all of the figures presented below, and thus some figures only contain data up until 2009.

Interpretation

Relative poverty measures set a poverty benchmark 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). Constant-value (CV) poverty measures select a median at a set point in time (e.g. 1998 or 2007) and then adjust forward and back in time for changes in consumer prices (i.e. they seek to maintain a constant buying power for the poverty benchmark over time). In his 2011 update, Perry [9] notes that in real terms, the median income in 1998 was similar to 1982 and thus there is a good case for using 1998 as the reference year for CV 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%. Thus the reference year was changed to 2007.

While reporting CV poverty figures back to 1982 using 2007 as the reference tells us what proportion were '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. Thus in the analyses which follow, 2007 CV figures are provided from 2007 onwards, with earlier years using 1998 as the reference year. The first two figures however, report 1998 and 2007 CV figures for the entire period, in order to demonstrate the impact the change of reference year has on the poverty rates produced.

Note: 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. For more detail on the methodology used see Perry 2012 [9].

Child Poverty by Ethnicity

In the NZHES only limited analyses by ethnic group are reported because of the relatively small sample sizes for Māori, Pacific and Other ethnic groups. While no time series data are available, poverty rates for Māori children are consistently higher than for European children [16]. For example, on average during 2010 to 2012, using the AHC 60% fixed line measure, around 34% of Māori children lived in poor households, as compared to 17% of European children. 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 DPB recipients were Māori). On average during 2010 to 2012, half (50%) of children living in poverty were Māori or Pacific, using the AHC 60% fixed line measure [16].

A number of risk factors for child poverty, such as family composition and parental employment are also of relevance to Māori children and these are reviewed below.

Child Poverty by Number of Children in Household

In New Zealand during 1984–2009, child poverty rates for households with three or more children were consistently higher than for those with one or two children (**Figure 4**).

Child Poverty Trends by Household Type

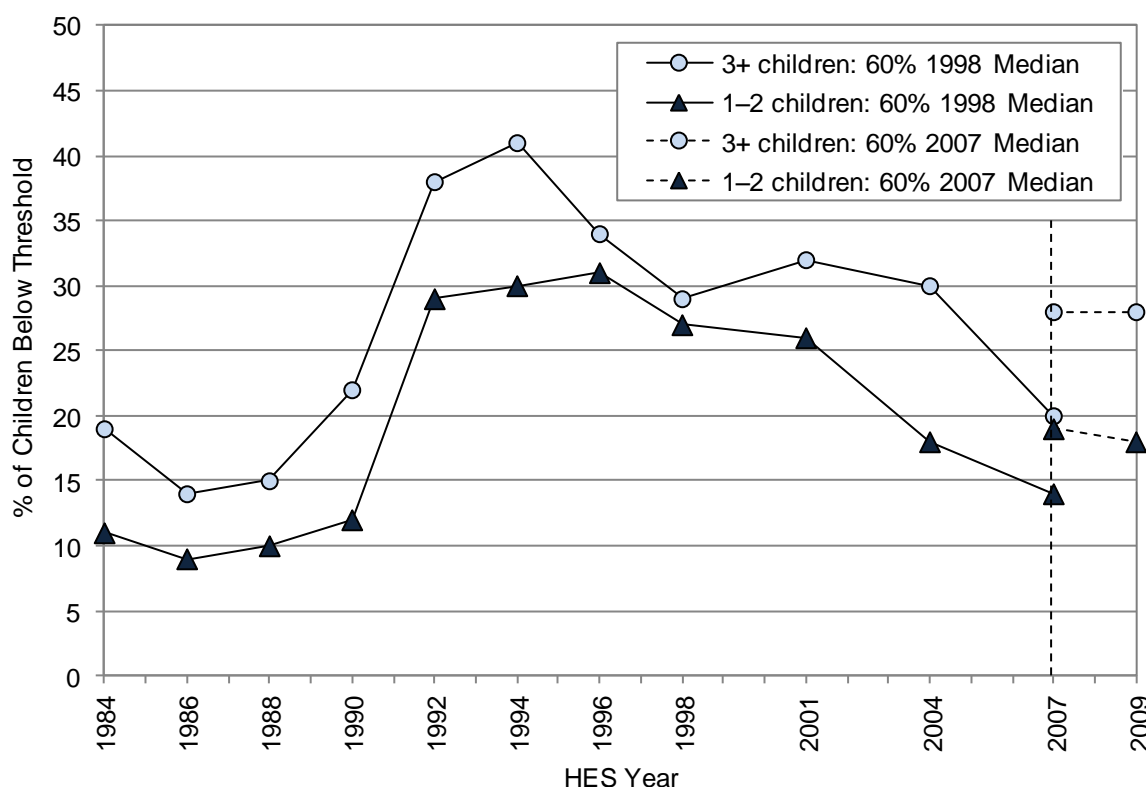
In New Zealand, child poverty rates for children in both sole-parent and two-parent households increased rapidly between 1988 and 1992. In absolute terms however, rates rose most rapidly for children in sole-parent households (rates peaked at 77% for sole-parent households in 1996 and at 29% for two-parent households in 1994). While rates for both household types declined between 2001 and 2007, during 2007 rates for those in sole-parent households remained higher than their 1980s levels, while rates for two-parent households were similar (**Figure 5**). (Note: One in three sole parent families live in wider households with other adults, and children living in these “other” households have significantly lower poverty rates than those living in sole parent households, because of the greater household resources available [9]).

Child Poverty Trends by Work Status of Adults in Household

In New Zealand, child poverty rates for children in workless households, 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 6**). (Note: During the 1980s, children in workless households were around twice as likely to be in poor households; during 1992–2004 four times more likely; and during 2007–2011 six to seven times more likely [9]).

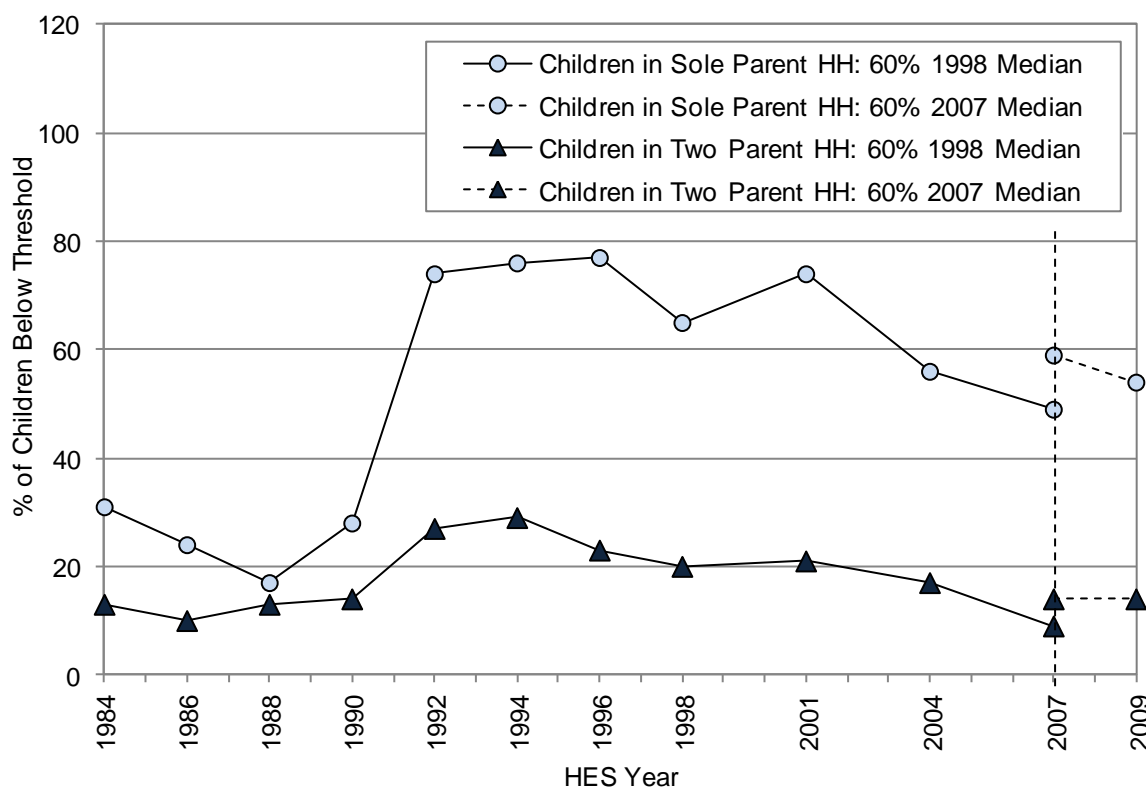


Figure 4. Proportion of Dependent Children Aged 0–17 Years Living Below the 60% Income Poverty Threshold After Housing Costs, by Number of Children in Household, New Zealand 1984–2009 HES Years



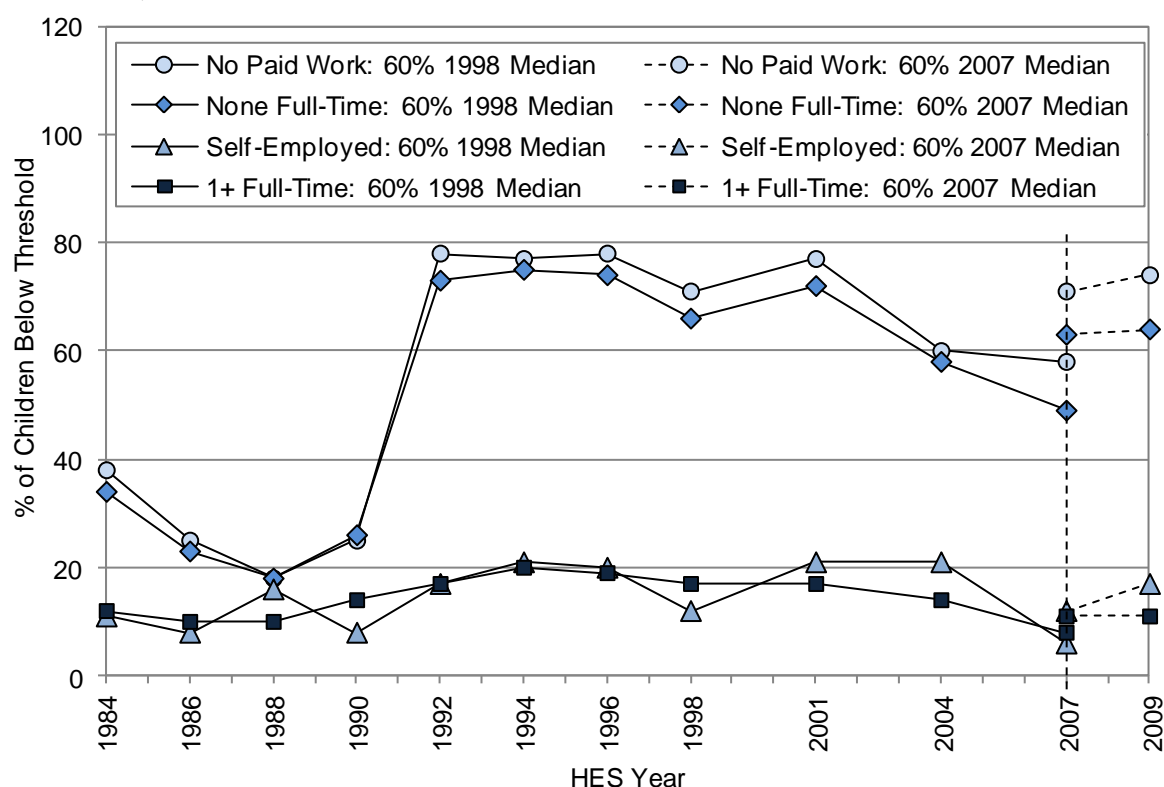
Source: Perry 2012 [9], derived from Statistics NZ Household Economic Survey (HES) 1984–2009

Figure 5. Proportion of Dependent Children Aged 0–17 Years Living Below the 60% Income Poverty Threshold After Housing Costs by Household Type, New Zealand 1984–2009 HES Years



Source: Perry 2012 [9], derived from Statistics NZ Household Economic Survey (HES) 1984–2009

Figure 6. Proportion 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 1984–2009 HES Years



Source: Perry 2012 [9], derived from Statistics NZ Household Economic Survey (HES) 1984–2009

New Zealand Distribution

Child Poverty Trends Using Different Poverty Measures

Before Housing Costs (BHC)

Relative Poverty (<60% Contemporary Median): In New Zealand, relative child poverty rose rapidly during 1990–1992, with Perry [9] attributing this to rising unemployment and the 1991 Benefit Cuts (which disproportionately reduced incomes for beneficiaries). During 1992–1998, relative child poverty then declined, as a result of falling unemployment and the incomes of those around the poverty line rising more quickly than the median. After 1998 however, as economic conditions improved, median incomes again rose, while incomes for many low-income households with children did not, resulting in a rise in child poverty up until 2004. From 2004 to 2007 relative poverty rates again declined as a result of the Working for Families package [9]. Between 2009 and 2010, however, there was an increase in child poverty, with rates then declining again during 2010–2012 [16].

After Housing Costs (AHC)

Relative Poverty (<60% Contemporary Median): In New Zealand during 1982–2011, while trends in relative child poverty after adjustment for housing costs (AHC) were broadly similar to before housing cost measures (BHC), AHC child poverty rates in 2011 were higher than in the 1980s, while BHC measures were closer to 1980s levels. Perry [9] attributes these differences to the fact that housing costs in 2011 accounted for a higher proportion of household expenditure for low-income households than they did in the 1980s (in 1988 17% of households in the lowest income quintile spent more than 30% of their income on housing; in 2007 this figure was 39%). Perry notes however that the income-related rental policies introduced in 2000, along with later changes to Accommodation Supplements, helped reduce housing expenditure for some low income households and that these changes contributed to reductions in AHC child poverty during 2001–2007. There were no further policy changes during 2007–2009 however, with maximum rates of assistance remaining fixed, as housing costs continued to increase [9]. This resulted in increases in AHC child poverty rates during 2007–2010, with rates remaining relatively static thereafter [16].

Child Poverty by Children's Age

In New Zealand during 1984–2011, poverty rates for younger children (0–6 years and 7–11 years) were generally higher than for older children (12–17 years).

Families with Reduced Living Standards

The Ministry of Social Development has undertaken three national Living Standards Surveys, in 2000, 2004 and 2008. The 2008 Survey collected information from 5000 households on their material circumstances, including ownership and quality of household durables, their ability to keep the house warm, pay the bills, have broken down appliances repaired, and pursue hobbies and other interests [19]. The following section briefly reviews the living standards of Māori children aged 0–17 years, using the 2008 Living Standards Survey's composite index of deprivation.

Data Source and Methods

Definition

Proportion of Children Aged 0–17 Years Experiencing Material Hardship

Data Source

The Ministry of Social Development's 2008 Living Standards Survey [19].

In the 2008 Living Standards Survey, 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. When the analysis was repeated using prioritised ethnicity however, the change in classification had minimal impact on the results.

Deprivation Index Used in 2008 Living Standards Survey

In the 2008 Living Standards Survey, 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

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)

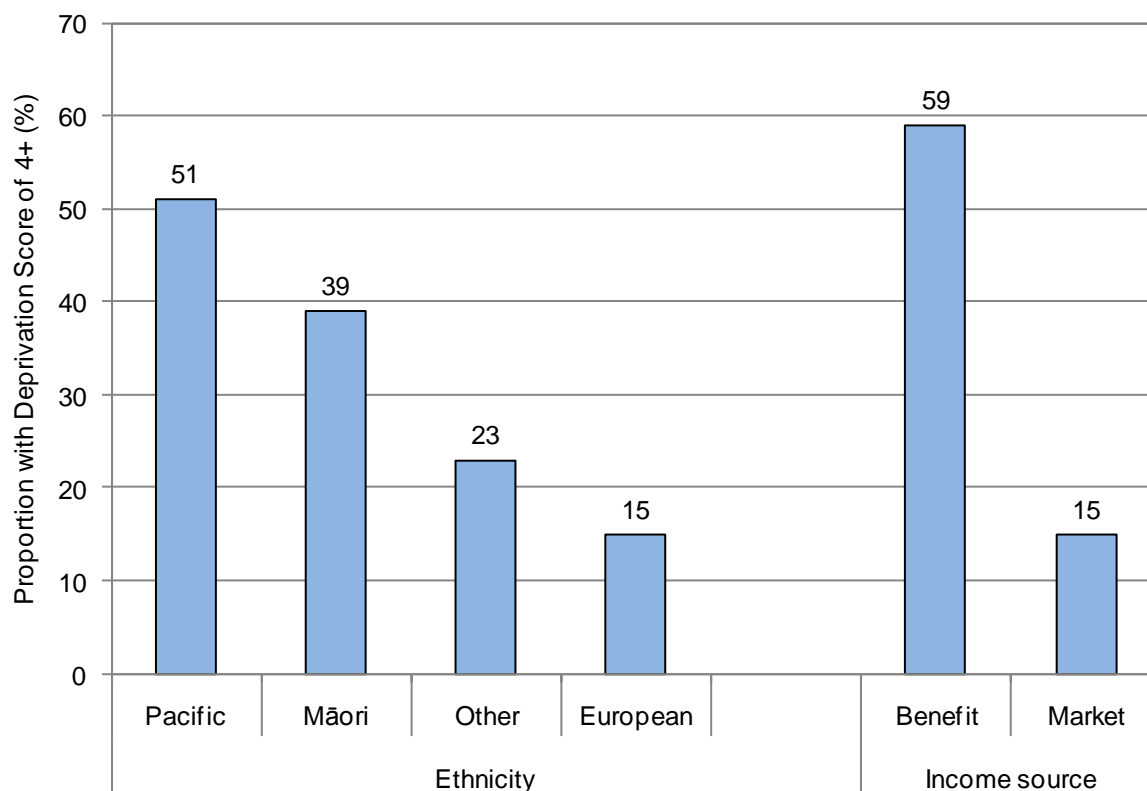
- Continued wearing worn out clothing
- Continued wearing worn out shoes
- Went without or cut back on fresh fruit and vegetables
- Bought cheaper or less meat than wanted
- Postponed visits to the doctor
- Did not pick up a prescription
- Put up with feeling cold to save on heating costs
- Went without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



Proportion of Children Experiencing Material Hardship

In the 2008 Living Standards Survey, 39% of Māori children aged 0–17 years experienced 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 7**). When broken down by individual item, those children experiencing material hardship had much higher exposures 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 (**Table 2**).

Figure 7. Proportion of Children Aged 0–17 Years Experiencing Material Hardship* by Ethnicity and Family Income Source, NZ Living Standards Survey 2008



Source: NZ 2008 Living Standards Survey [19]; Note: *Material Hardship defined as scoring four or more on a composite deprivation index measuring a range of “enforced lacks”, as outlined in the Methods box; Ethnicity is Total Response

Table 2. Restrictions Experienced by Children, by the Deprivation Score of their Family, NZ Living Standards Survey 2008

	Percentage (%)					
	All	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 weeks 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 [19]

Local Policy Documents and Evidence-Based Reviews Relevant to Child Poverty and Living Standards
The Determinants of Health for Children and Young People in New Zealand [6] contains an overview of local policy documents and evidence-based reviews which are relevant to the social policy environment and the socioeconomic determinants of child and youth health.

UNEMPLOYMENT RATES

Introduction

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

Background

In New Zealand, unemployment rates rose rapidly during 2009, and since then have remained mainly in the mid-to-high 6% range [20], with the highest unemployment rates being seen amongst Māori and Pacific people, young people (particularly those 15–19 years) and those without formal qualifications [21]. Such increases are of concern for Māori children and young people for two reasons:

Firstly, research suggests that children in families where their parents are unemployed have higher rates of psychosomatic symptoms, chronic illnesses and low wellbeing, [22], with these negative effects potentially being mediated via the impact unemployment has on parents' mental health, self-esteem and parenting [22] [23].

Secondly, research suggests that for young people, unemployment leads to a range of negative psychological outcomes including depression, anxiety and low self-esteem, which in turn are associated with adverse outcomes such as heavy tobacco, alcohol and drug use; and higher mortality from suicide and accidents [24]. On a more positive note, research also suggests that this psychological distress decreases once young people find permanent employment, or return to further education [24].

Data Source and Methods

Definition

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

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 [25]

Note 1: 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 [26].

Seasonally Adjusted Unemployment Rates

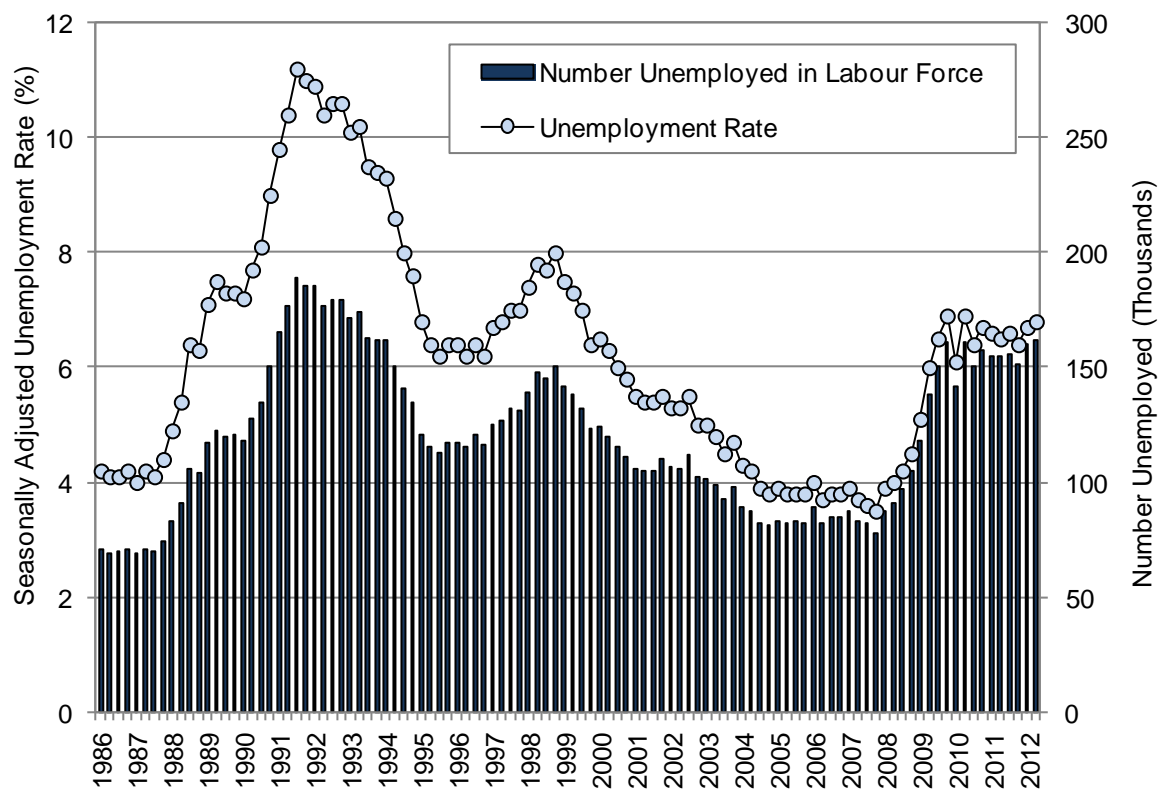
In the quarter ending June 2012, the seasonally adjusted unemployment rate rose to 6.8%, while seasonally adjusted unemployment numbers increased from 160,000 in the March 2012 quarter to 162,000 in the June quarter (**Figure 8**). The number of people employed decreased by 2,000 to reach 2,227,000 [20].

Unemployment Rates by Ethnicity

In New Zealand during 2008(Q1)–2012(Q2) unemployment rates were consistently higher for Māori, than for Asian/Indian and European people. Unemployment rates amongst Māori increased during 2008 and 2009, but became more static during 2010(Q1)–2012(Q2), with unemployment rates during 2012(Q2) being 12.8% for Māori, as compared to 5.2% for European people (**Figure 9**).

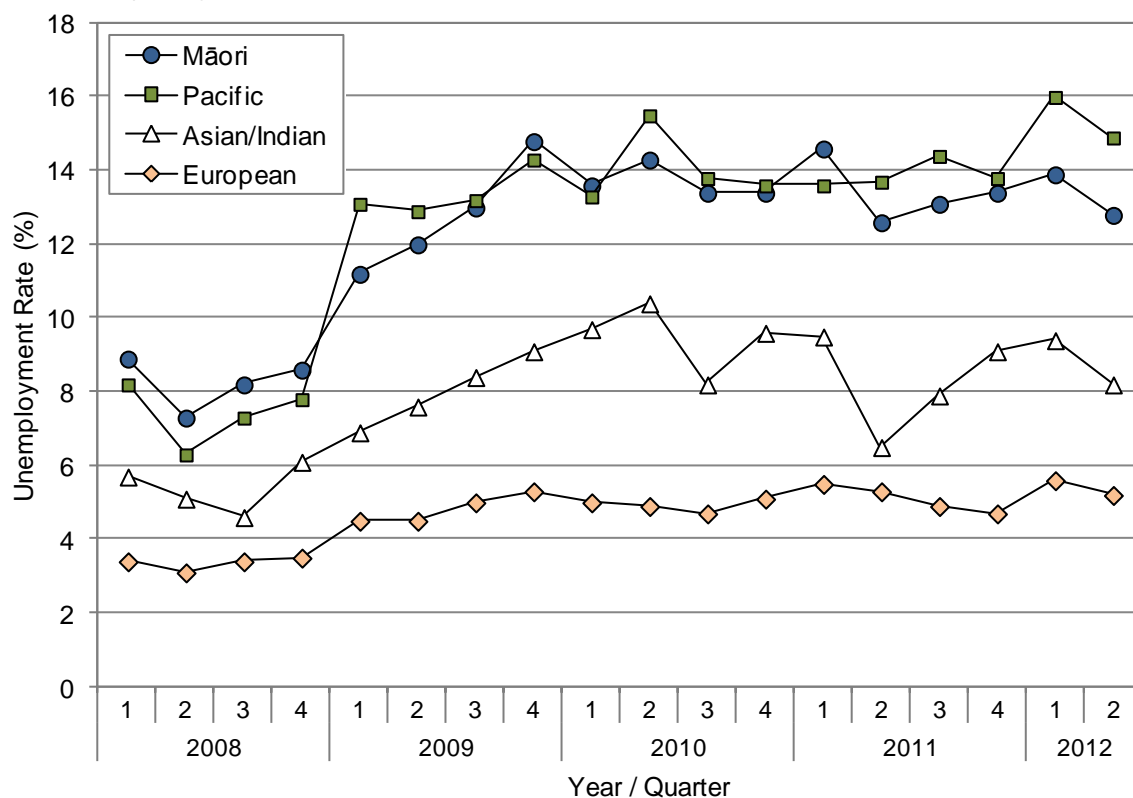


Figure 8. Seasonally Adjusted Unemployment Rates, New Zealand Quarter 1 (March) 1986 to Quarter 2 (June) 2012



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

Figure 9. Unemployment Rates by Ethnicity, New Zealand Quarter 1 (March) 2008 to Quarter 2 (June) 2012



Source: Statistics New Zealand Household Labour Force Survey; Note: Ethnicity is Total Response

New Zealand Distribution

Unemployment Rates by Age

In New Zealand during June 1987–2012, unemployment rates were consistently higher for younger people (15–19 years > 20–24 years > 25–29 years > 35–39 years and 45–49 years). During the year ending June 2012, annual unemployment rates were 23.7% for those 15–19 years and to 12.8% for those 20–24 years.

Unemployment Rates by Age and Gender

In New Zealand during June 1987–2012, there were no consistent gender differences in unemployment rates for young people aged 15–24 years. During the year ending June 2012, unemployment rates for those aged 15–19 years were 21.9% for females and 25.4% for males, while for those aged 20–24 years, rates were 12.8% for both females and males.

Unemployment Rates by Qualification

In New Zealand during June 1987–2012, unemployment rates were higher for those with no qualifications, followed by those with school qualifications, or post school but no school qualifications, followed by those with both post school and school qualifications. In the year ending June 2012, unemployment rates were 10.2% for those with no qualifications, 8.1% for those with school qualifications, 7.4% for those with post school but no school qualifications and 4.6% for those with post school and school qualifications.

Duration of Unemployment

In New Zealand during June 1987–2012, 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. The proportion of people unemployed for more than 27 weeks however, has been increasing since June 2008.

Local Policy Documents and Evidence-Based Reviews Relevant to Unemployment

The Determinants of Health for Children and Young People in New Zealand [6] contains an overview of 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

The following section reviews the number of children aged 0–18 years who were reliant on a benefit recipient during April 2000–2012, using information from the Ministry of Social Development's SWIFTT database. As the SWIFTT database does not collect information on the ethnicity of children reliant on benefit recipients (only information on the ethnicity of the benefit recipient themselves is recorded), no breakdown by ethnicity is available for this indicator. However, with the information in the previous section on unemployment suggesting that the economic downturn may have disproportionately impacted on Māori whānau, it is likely that many of the trends presented in this section will be of particular relevance to Māori children.

Background

Perry, in his review of incomes in New Zealand, noted that the higher poverty rates seen amongst Māori children most likely reflected the relatively high proportion of Māori children living in sole parent beneficiary households, with around 43% of DPB recipients during 2007–2010 being Māori [9]. The importance of income adequacy for these children was highlighted by the 2008 Living Standards Survey [19] which found that 59% of children whose main source of family income was a benefit, scored four or more on a composite Deprivation Index. This Deprivation Index measured the extent to which families were economising on a range of items including being able to keep the main rooms of the house warm in winter, and having a meal with meat/chicken/fish at least every second day. Families scoring four or more on this Index 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; that they were cutting back on meat and fresh fruit and vegetables; and that they were postponing doctor's visits because of cost, all factors which are likely to impact adversely on the health and wellbeing of Māori children.

Data Source and Methods

Definition

1. Number of children aged 0–18 years reliant on a benefit recipient by benefit type

Data Source

Numerator: SWIFTT Database: Number of children aged 0–18 years who were reliant on a benefit recipient

Denominator: Statistics NZ Estimated Resident Population as at 31 March

Notes on Interpretation

Note 1: All data in this section was provided by the Ministry of Social Development (MSD) and are 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 [27]. It is thus able to provide 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 April and provide no information on those receiving assistance at other times of the year.

Note 3: New Zealand trend data are for children 0–18 years, whereas Service Centre data may also include a very small number (n=3 in 2012) of young people aged 19+ years.

Note 4: "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, or Non-benefit assistance.

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/>

Number of New Zealand Children Reliant on a Benefit Recipient

In New Zealand, the number of children aged 0–18 years who were reliant on a benefit recipient declined from 272,613 in April 2000, to 201,083 in April 2008, before increasing again to 234,572 in April 2011. By April 2012, 229,443 were reliant on a benefit recipient. Much of this variation can be attributed to changes in children relying on unemployment benefit recipients, with numbers falling from 49,499 in April 2000 to 5,289 in April 2008, before increasing again to 16,380 in 2010. In April 2012, 13,669 children were reliant on an unemployment benefit recipient. The number of children reliant on Domestic Purposes Benefit (DPB) recipients also fell from 188,216 in April 2000, to 158,173 in 2008, before increasing again to 180,845 in 2011 (**Table 3**).

Proportion of New Zealand Children Reliant on a Benefit Recipient

In New Zealand the proportion of children aged 0–18 years who were reliant on a benefit recipient fell from 24.9% in April 2000 to 17.5% in April 2008, before increasing again to 20.4% in 2011. By April 2012, 20.1% of all New Zealand children were reliant on a benefit recipient. A large part of the initial decline was due to a fall in the proportion of children reliant on unemployment benefit recipients (from 4.5% of children in 2000, to 0.5% in 2008; but increasing again to 1.4% in 2011 and 1.2% in 2012). While the proportion of children reliant on DPB recipients also fell (from 17.2% of children in 2000, to 13.8% in 2008; and back up to 15.8% in 2011 and 15.7% in 2012) (**Figure 10**), the rate of decline was much slower than for unemployment benefits, meaning that in relative terms, the proportion of benefit-dependent children reliant on DPB recipients actually increased, from 69.0% of benefit-dependent children in 2000, to 78.1% in 2012 (**Table 3**).

New Zealand Distribution by Age

At the end of April 2012, the proportion of children reliant on a benefit recipient was highest for those 0–4 years of age. Rates then tapered off gradually during middle-to-late childhood and early adolescence, then very steeply after 17 years (**Figure 11**).

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

The Determinants of Health for Children and Young People in New Zealand [6] contains an overview of local policy documents and evidence-based reviews which are relevant to the social policy environment and the socioeconomic determinants of child and youth health.

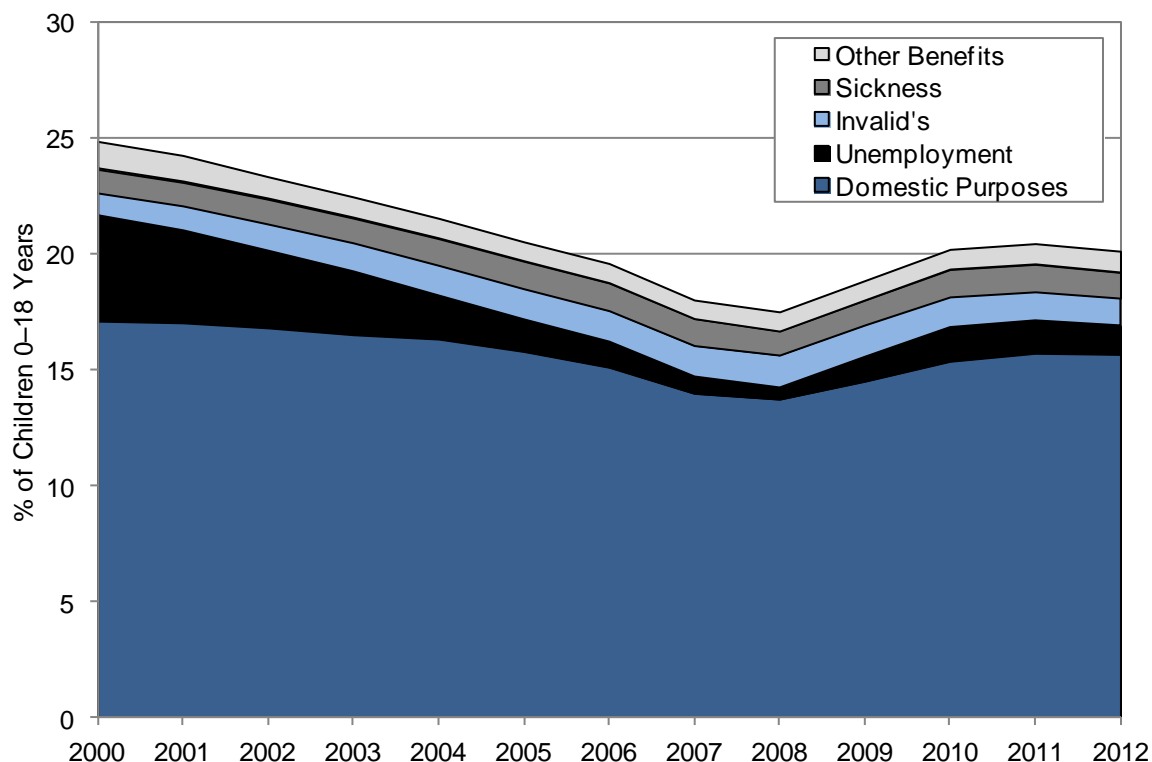


Table 3. Number of Children Aged 0–18 Years who were Reliant on a Benefit Recipient by Benefit Type, New Zealand April 2000–2012

Year	Domestic Purposes		Unemployment		Invalid's		Sickness		Other Benefits		Total
	Number	%*	Number	%*	Number	%*	Number	%*	Number	%*	Number
2000	188,216	69.0	49,499	18.2	11,120	4.1	11,295	4.1	12,483	4.6	272,613
2001	187,791	70.5	43,245	16.2	12,122	4.5	11,253	4.2	12,097	4.5	266,508
2002	187,207	72.3	36,342	14.0	13,219	5.1	11,983	4.6	10,205	3.9	258,956
2003	186,184	73.8	30,067	11.9	14,225	5.6	12,119	4.8	9,795	3.9	252,390
2004	185,610	76.0	20,663	8.5	15,053	6.2	13,182	5.4	9,566	3.9	244,074
2005	180,035	77.2	15,134	6.5	15,214	6.5	13,636	5.8	9,258	4.0	233,277
2006	172,995	77.4	12,069	5.4	15,332	6.9	13,797	6.2	9,429	4.2	223,622
2007	160,634	77.8	7,819	3.8	15,247	7.4	13,515	6.5	9,169	4.4	206,384
2008	158,173	78.7	5,289	2.6	15,962	7.9	12,128	6.0	9,531	4.7	201,083
2009	167,142	77.2	11,581	5.3	15,800	7.3	12,482	5.8	9,573	4.4	216,578
2010	177,226	76.3	16,380	7.1	15,116	6.5	13,752	5.9	9,757	4.2	232,231
2011	180,845	77.1	15,711	6.7	14,273	6.1	13,748	5.9	9,995	4.3	234,572
2012	179,204	78.1	13,669	6.0	13,552	5.9	12,774	5.6	10,244	4.5	229,443

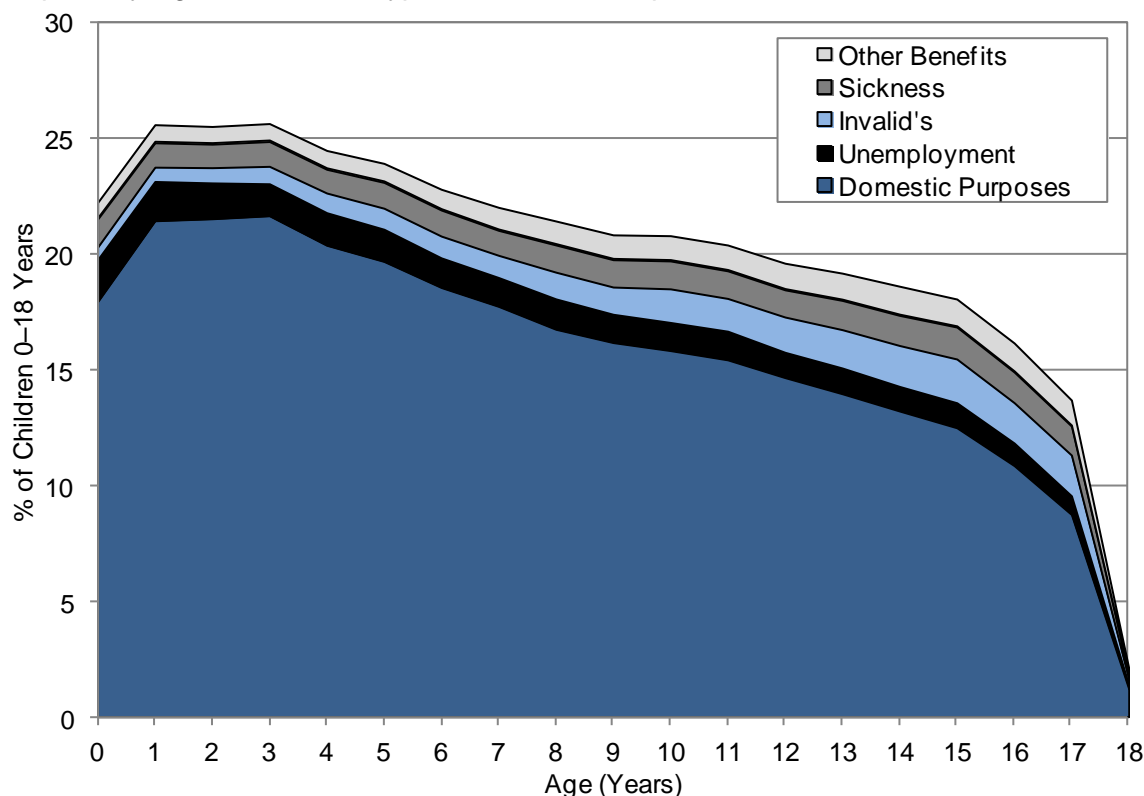
Source: MSD SWIFTT Database; Note: *% refers to % of children relying on benefit recipients, rather than % of all children; See Methods section for composition of "Other Benefits"; Non-benefit Assistance not included

Figure 10. Proportion of All Children Aged 0–18 Years who were Reliant on a Benefit Recipient by Benefit Type, New Zealand April 2000–2012



Source: Numerator: MSD SWIFTT Database; Denominator: Statistics NZ Estimated Resident Population; Note: See Methods section for composition of "Other Benefits"

Figure 11. Proportion of All Children Aged 0–18 Years who were Reliant on a Benefit Recipient by Age and Benefit Type, New Zealand April 2012



Source: Numerator: Numerator: MSD SWIFTT Database; Denominator: Statistics NZ Estimated Resident Population; Note: See Methods section for composition of "Other Benefits"

YOUNG PEOPLE RELIANT ON BENEFITS

Introduction

The following section uses data from the Ministry of Social Development's SWIFTT database to review the number of Māori young people aged 16–24 years who were reliant on a benefit during 2000–2012.

Background

In New Zealand, young people who newly enter the benefit system comprise three main groups: those coming on to the Invalid's Benefit, many of whom have long-term disabilities; young mothers coming on to the Emergency Maintenance Allowance because they do not have financial support from their families; and young people taking up the Independent Youth Benefit because they do not have the support of their families. Research suggests that for these young people, being reliant on a benefit at a young age is linked to long-term benefit receipt. Of all young people aged 16 and 17 years who entered the benefit system in 1999, 42% were on a benefit in 2009 (although most of these people had not received a benefit for all of the ten year period) [28].

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 (projected from 2007)

Notes on Interpretation

Note 1: All data in this section was provided by the Ministry of Social Development (MSD) and is 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 [27]. It is thus able to provide information on the recipients of financial assistance through Work and Income.

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

Note 3: "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, or Non-benefit assistance.

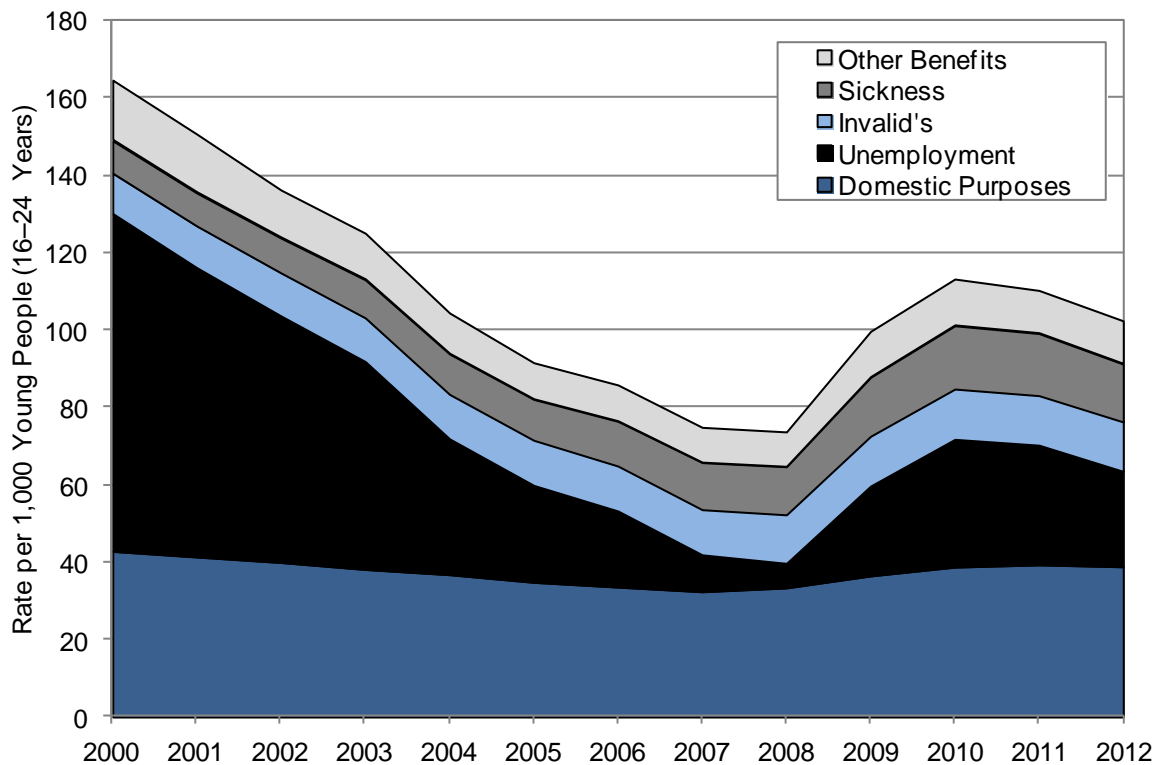
To be eligible for a benefit, clients must have insufficient income from all sources to support themselves and any dependents and meet specific eligibility criteria. The current eligibility criteria for benefits can be found at <http://www.workandincome.govt.nz/individuals/a-z-benefits/>

Proportion of New Zealand Young People Reliant on Benefits

In New Zealand during April 2000–2012, there were large fluctuations in the number of young people aged 16–24 years reliant on a benefit, with rates falling from 164.4 per 1,000 in April 2000, to 73.8 per 1,000 in April 2008, before increasing again to 113.2 per 1,000 in April 2010. By April 2012, rates had again fallen to 102.4 per 1,000 (**Figure 12**).

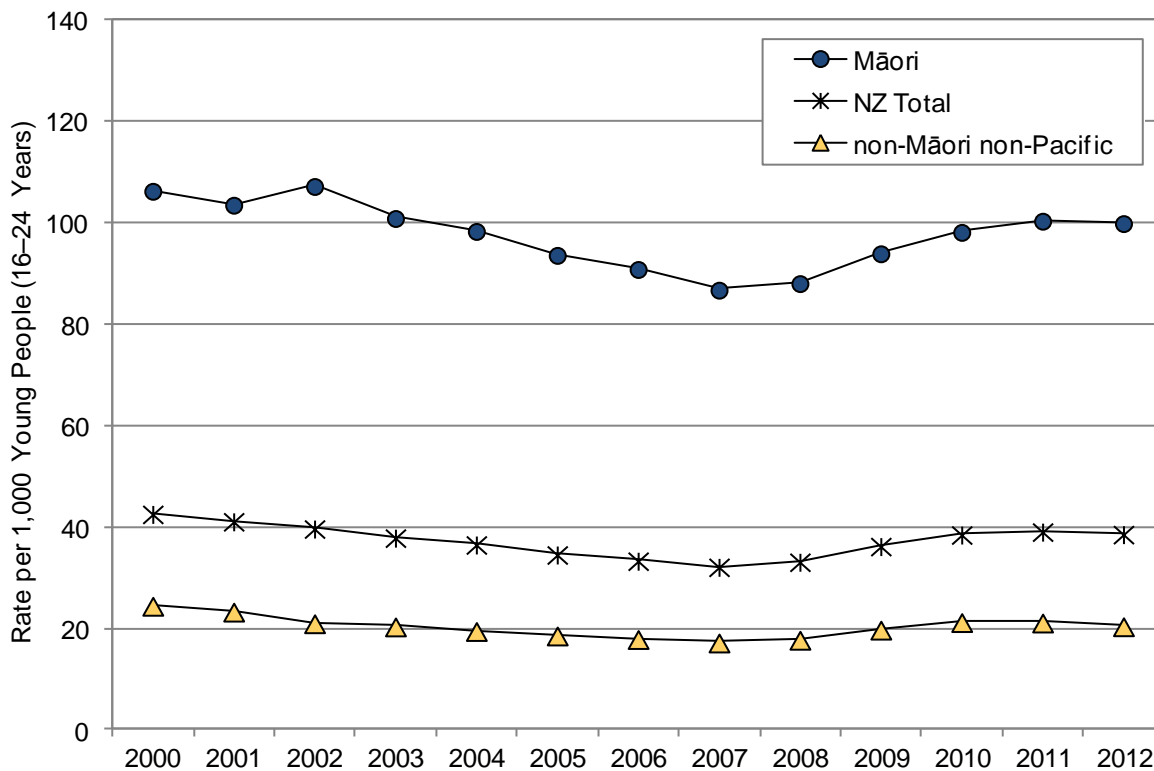
When broken down by benefit type, the largest initial declines were seen for those reliant on an unemployment benefit, with rates falling from 87.7 per 1,000 in April 2000, to 6.4 per 1,000 in April 2008, before increasing again to 33.2 per 1,000 in April 2010. By April 2012 rates had again fallen to 24.8 per 1,000. In contrast, the proportion reliant on a domestic purposes benefit declined much more slowly, from 42.6 per 1,000 in 2000, to 32.2 per 1,000 in 2007, before increasing again to 39.2 in 2011. The proportion reliant on invalid's and sickness benefits however, increased for the majority of 2000–2012. Thus by April 2012, 12.7 per 1,000 young people were reliant on an invalid's benefit and 14.6 per 1,000 on a sickness benefit (**Figure 12**).

Figure 12. Proportion of Young People Aged 16–24 Years Receiving a Benefit by Benefit Type, New Zealand April 2000–2012



Source: Numerator: MSD SWIFFT database; Denominator: Statistics NZ Estimated Resident Population; Note: See Methods section for composition of "Other Benefits"; Non-benefit Assistance not included

Figure 13. Proportion of Young People Aged 16–24 Years Receiving a Domestic Purposes Benefit by Ethnicity, New Zealand April 2000–2012



Source: Numerator: MSD SWIFFT database; Denominator: Statistics NZ Estimated Resident Population; Note: DPB includes DPB Sole Parent and Emergency Maintenance Allowance

Distribution by Ethnicity

Domestic Purposes Benefits

In New Zealand during April 2000–2012, domestic purposes benefit uptake was higher for Māori than for non-Māori non-Pacific young people, with both ethnic groups experiencing a decline in benefit uptake during the mid 2000s, followed by an upswing in rates after 2008. By the end of April 2012, 100.0 per 1,000 Māori young people and 20.5 per 1,000 non-Māori non-Pacific young people were reliant on a domestic purposes benefit (**Figure 13**).

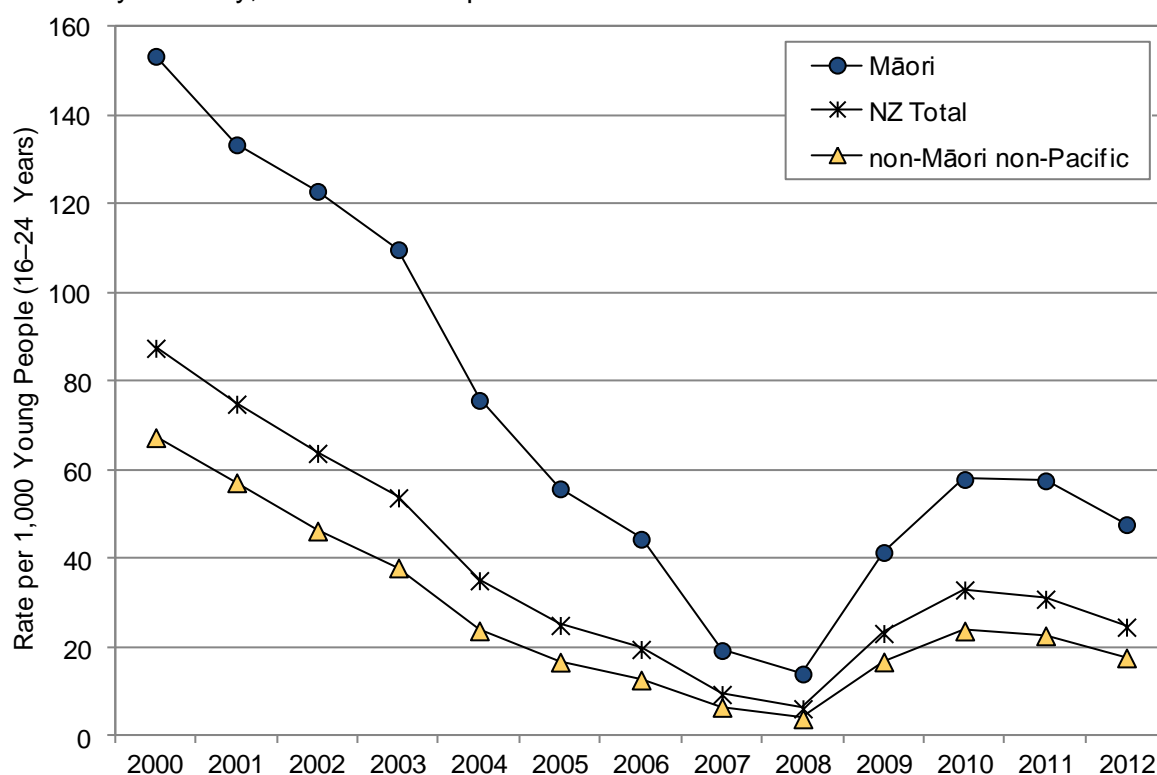
Unemployment Benefits

In New Zealand during April 2000–2012, unemployment benefit uptake was also higher for Māori young people than for non-Māori non-Pacific young people, with both ethnic groups experiencing a marked decline in unemployment benefit uptake during the early to mid 2000s, followed by an upswing in rates after 2008. By the end of April 2012 however, rates had again fallen to 47.9 per 1,000 for Māori young people and 17.8 per 1,000 for non-Māori non-Pacific young people (**Figure 14**).

Sickness and Invalid's Benefits

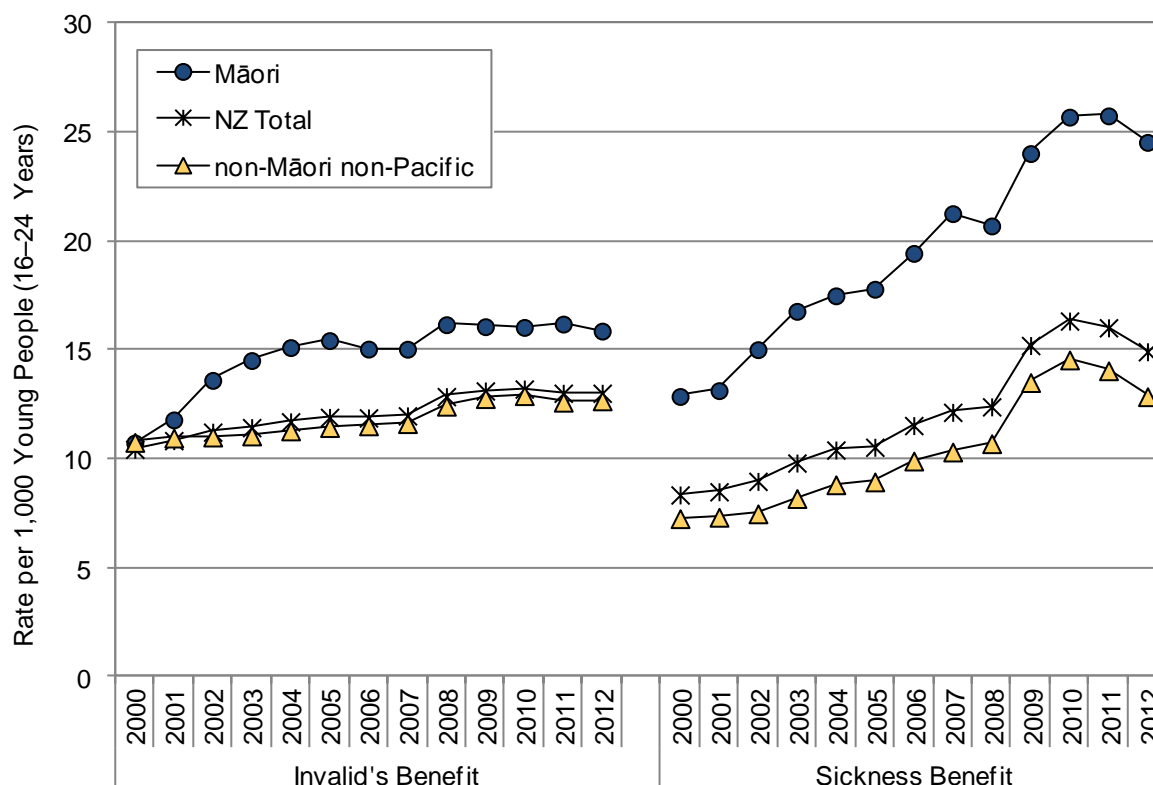
In New Zealand during April 2000–2012, sickness and invalid's benefit uptake was higher for Māori young people than for non-Māori non-Pacific young people. Invalid's and sickness benefit uptake increased for both ethnic groups during the 2000s, although these increases began to taper off during 2011 and 2012, particularly for the sickness benefit. Thus by April 2012, invalid's benefit uptake was 15.9 per 1,000 for Māori and 12.7 per 1,000 for non-Māori non-Pacific young people. Sickness benefit uptake was 24.6 per 1,000 for Māori and 12.9 per 1,000 for non-Māori non-Pacific young people (**Figure 15**).

Figure 14. Proportion of Young People Aged 16–24 Years Receiving an Unemployment Benefit by Ethnicity, New Zealand April 2000–2012



Source: Numerator: MSD SWIFFT database; Denominator: Statistics NZ Estimated Resident Population; Note: Training-Related Unemployment Benefits Excluded

Figure 15. Proportion of Young People Aged 16–24 Years Receiving an Invalid's or Sickness Benefit by Ethnicity, New Zealand April 2000–2012



Source: Numerator: MSD SWIFFT database; Denominator: Statistics NZ Estimated Resident Population

New Zealand Distribution

Distribution of Sickness and Invalid's Benefits by Cause of Incapacity

Invalid's Benefit

In New Zealand during April 2012, 33.0% of young people receiving an invalid's benefit required financial support for psychological/psychiatric reasons, while 19.7% required support for intellectual disabilities. An additional 21.8% required support as the result of congenital conditions and 8.4% as the result of nervous system problems.

Sickness Benefit

Similarly during April 2012, 54.6% of young people receiving a sickness benefit required financial support for psychological/psychiatric reasons while 11.2% required support as the result of a pregnancy. Accidents (8.0%), substance abuse (6.2%) and musculoskeletal problems (4.4%) also made a significant contribution.

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

The Determinants of Health for Children and Young People in New Zealand [6] contains an overview of local policy documents and evidence-based reviews which are relevant to the social policy environment and the socioeconomic determinants of child and youth health.



SOCIOECONOMIC AND CULTURAL DETERMINANTS



HOUSEHOLD COMPOSITION

CHILDREN IN SOLE PARENT HOUSEHOLDS

Introduction

The following section uses Census data to review the proportion of Māori children aged 0–14 years who were living in sole parent households during 2006.

Background

Over the past 20 years, New Zealand has seen a decline in the proportion of two parent families and an increase in the proportion of one-parent families. In 1976, 10.4% of families with dependent children had one resident parent, compared to 28.1% in 2006 [29]. It is estimated that a third of New Zealand children have lived with a solo mother by the time they are 17 years old [30]. Sole-parenthood is more common among Māori children than NZ European children [31]. For example in 2006, 36% of Māori babies lived with a sole mother, as compared to 14% of NZ European babies. One-parent families are a heterogeneous group however, that differ by their route into sole parenthood (which may result from bereavement, separation, imprisonment of a spouse, or birth outside of a live-in relationship), and by the parent's gender, age, health, and socioeconomic circumstances [31]. Many children in sole-parent families have a parent living in another household who is actively involved in their care and financial support.



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 0–14 years living in sole parent households, where the child was home on Census night.

Denominator: NZ Census: Total number of children 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.

Distribution by Ethnicity

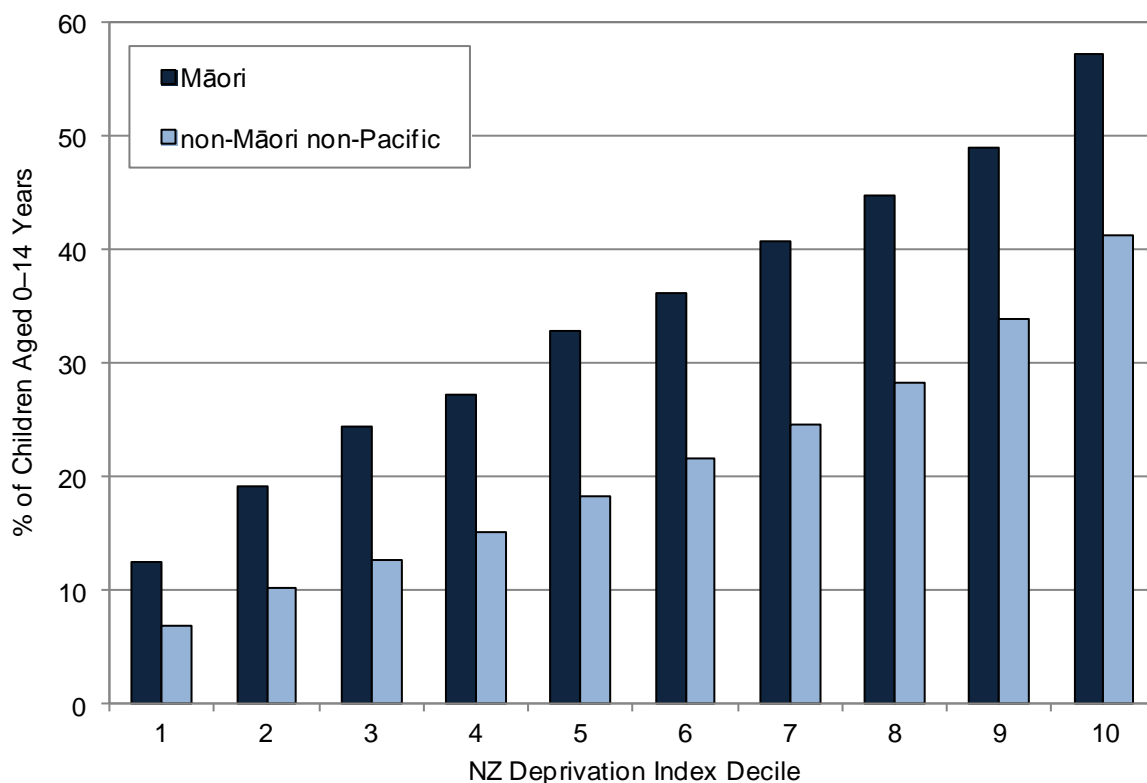
In New Zealand during 2006, 42.6% of Māori children lived in sole parent households, as compared to 18.5% of non-Māori non-Pacific children, with the proportion of Māori children living in sole parent households being *significantly* higher than for non-Māori non-Pacific children (**Table 4**).

Table 4. Proportion of Children Aged 0–14 Years Living in Sole Parent Households by Ethnicity, New Zealand at the 2006 Census

Ethnicity	Number of Children in Sole Parent Households	Rate (%)	Rate Ratio	95% CI
Children 0–14 Years Living in Sole Parent Households				
Māori	81,390	42.60	2.30	2.29–2.32
non-Māori non-Pacific	101,820	18.49	1.00	

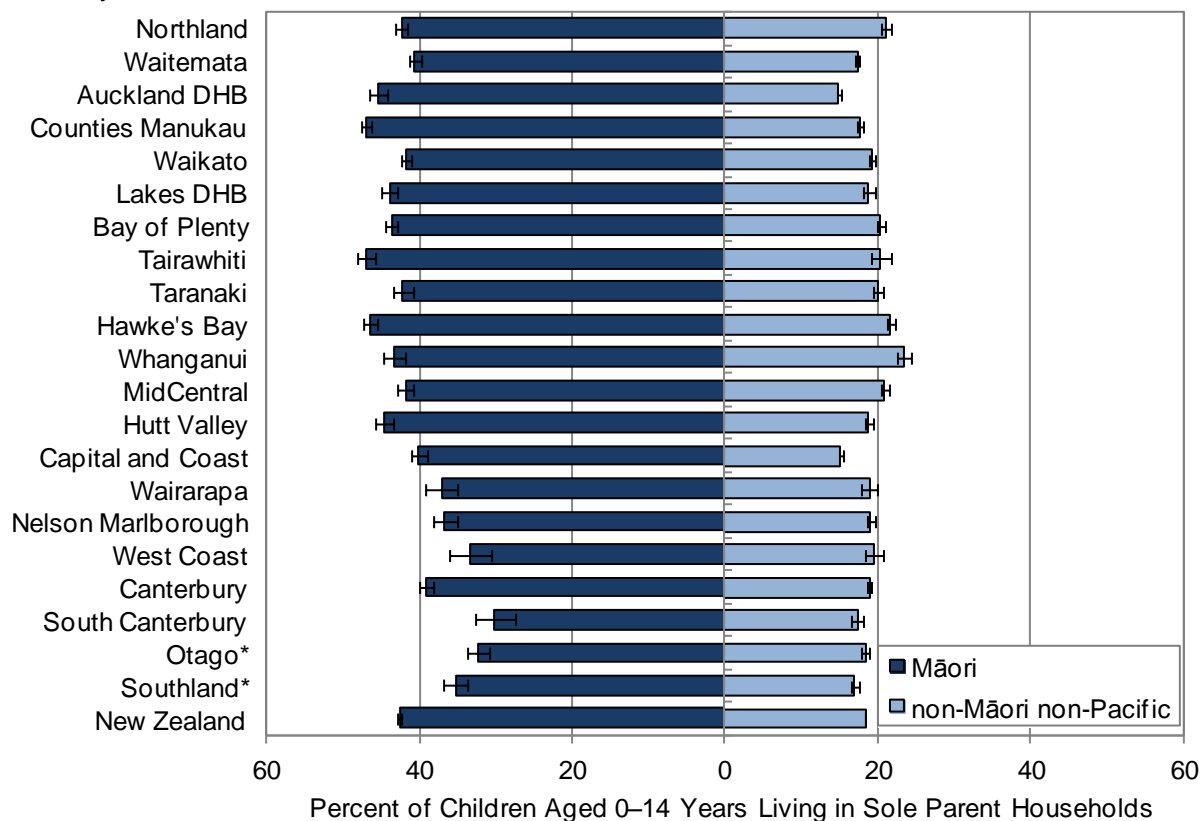
Source: Statistics New Zealand.

Figure 16. Proportion of Children Aged 0–14 Years Living in Sole Parent Households by Ethnicity and NZ Deprivation Index Decile, New Zealand at the 2006 Census



Source: Statistics New Zealand

Figure 17. Proportion of Children Aged 0–14 Years Living in Sole Parent Households by Ethnicity and District Health Board, New Zealand at the 2006 Census



Source: Statistics New Zealand; Note: *Southern DHB

Distribution by Ethnicity and NZ Deprivation Index Decile

In New Zealand during 2006, the proportion of Māori children living in sole parent households increased with increasing NZDep deprivation, with the highest rates being seen amongst those living in the most deprived (NZDep decile 10) areas. At each level of NZDep deprivation, the proportion of Māori children living in sole parent households was higher than for non-Māori non-Pacific children (**Figure 16**).

Distribution by Ethnicity and DHB

In New Zealand during 2006, the proportion of Māori children living in sole parent households varied by DHB, with rates ranging from 30.1% in South Canterbury to 46.9% in Counties Manukau and Tairāwhiti. Within each DHB, the proportion of Māori children living in sole parent households was *significantly* higher than for non-Māori non-Pacific children (**Figure 17, Table 5**).

Table 5. Proportion of Children Aged 0–14 Years Living in Sole Parent Households by Ethnicity and District Health Board, New Zealand at the 2006 Census

District Health Board	Māori (%)	non-Māori non-Pacific (%)	Rate Ratio*	95% CI
Children 0–14 Years Living in Sole Parent Households				
Northland	42.2	21.2	1.99	1.92–2.07
Waitemata	40.6	17.5	2.32	2.26–2.39
Auckland	45.4	15.5	2.92	2.81–3.03
Counties Manukau	46.9	17.6	2.67	2.60–2.74
Waikato	41.6	19.6	2.12	2.06–2.18
Lakes	43.9	18.9	2.33	2.22–2.45
Bay of Plenty	43.6	20.5	2.13	2.06–2.21
Tairāwhiti	46.9	20.4	2.30	2.14–2.47
Taranaki	42.1	20.0	2.11	2.01–2.22
Hawke's Bay	46.5	21.7	2.14	2.06–2.22
Whanganui	43.3	23.4	1.86	1.75–1.97
MidCentral	41.8	21.0	1.99	1.92–2.07
Hutt Valley	44.5	19.2	2.32	2.22–2.43
Capital and Coast	40.1	15.6	2.58	2.47–2.69
Wairarapa	37.0	18.8	1.97	1.80–2.16
Nelson Marlborough	36.7	19.2	1.91	1.80–2.03
West Coast	33.3	19.7	1.69	1.50–1.91
Canterbury	39.2	18.9	2.07	2.00–2.14
South Canterbury	30.1	17.3	1.74	1.55–1.95
Otago ⁺	32.3	18.5	1.75	1.64–1.86
Southland ⁺	35.3	17.0	2.07	1.95–2.21
New Zealand	42.6	18.5	2.31	2.29–2.33

Source: Statistics New Zealand; Note: *Rate Ratio compares rate for Māori and non-Māori non-Pacific children and young people in each DHB; ⁺ Southern DHB



New Zealand Distribution

In New Zealand during 2006, 25.2% of children aged 0–14 years lived in sole parent households.

Distribution by NZ Deprivation Index Decile

In New Zealand during 2006, the proportion of children living in sole parent households increased with increasing NZDep deprivation, with rates rising from 7.4% for those living in the least deprived (NZDep decile 1) areas, to 47.1% for those living in the most deprived (NZDep decile 10) areas.

Local Policy Documents and Evidence-Based Reviews Relevant to Family Composition

There is little guidance for health professional in New Zealand on dealing with children undergoing changes in family composition. *The Determinants of Health for Children and Young People in New Zealand* [6] contains an overview of recent Ministry of Social Development and Families Commission publications which consider family composition and resilience in separated, solo parent and step-parent families.



HOUSEHOLD CROWDING

Introduction

The following section uses Census data to review the proportion of Māori children and young people aged 0–24 years who were living in crowded households during 2006.

Background

It has been known for centuries that housing is an important determinant of health [32], with cold and damp housing having been linked to respiratory conditions in children, and to reduced educational achievement, emotional wellbeing and resilience [33]. In New Zealand, household crowding has been associated with meningococcal disease and acute rheumatic fever in children [34,35], while internationally, research has suggested correlations between crowding and tuberculosis, respiratory infections, hepatitis B and other enteric disease, conjunctivitis, and poor mental health outcomes [36].

In New Zealand there are large disparities in access to healthy housing. A recent report found that some children in New Zealand are currently “exposed to housing in poor condition, housing that is unaffordable, housing that has insecure tenure and households that are crowded” [37]. At the time of the 2006 Census, 1 in 13 Māori households were defined as crowded and rates of crowding were consistently higher for Māori (23 per cent) than for NZ Europeans (5 per cent) [38]. Crowding is also more common among households on a low income, households in rental accommodation, particularly state owned rental accommodation, households with a younger age structure, those that have more dependent children, and those that contain two or more families, or a single parent family [39].

Māori are also more likely than NZ Europeans to live in rental properties, and home ownership between 1991 and 2006 declined more substantially for Māori (by 13 per cent) than for NZ Europeans (by 9 per cent) [40]. This is of concern as research also suggests that rental accommodation is of lower quality than owner-occupied homes, is more likely to lack insulation, and is more prone to damp and mould [41].

Data Source and Methods

Definition

The proportion of children and young people aged 0–24 years living in crowded households, as defined by the Canadian National Occupancy Standard

Data Source

Numerator: Census: The number of children and young people 0–24 years living in households which required one or more additional bedrooms.

Denominator: Census: The total number of children and young people 0–24 years at the Census for whom crowding status was known.

Notes on Interpretation

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 (i.e. the unit of reference is the child and thus 2 children from the same household will be counted twice in these statistics).

Canadian National Occupancy Standard

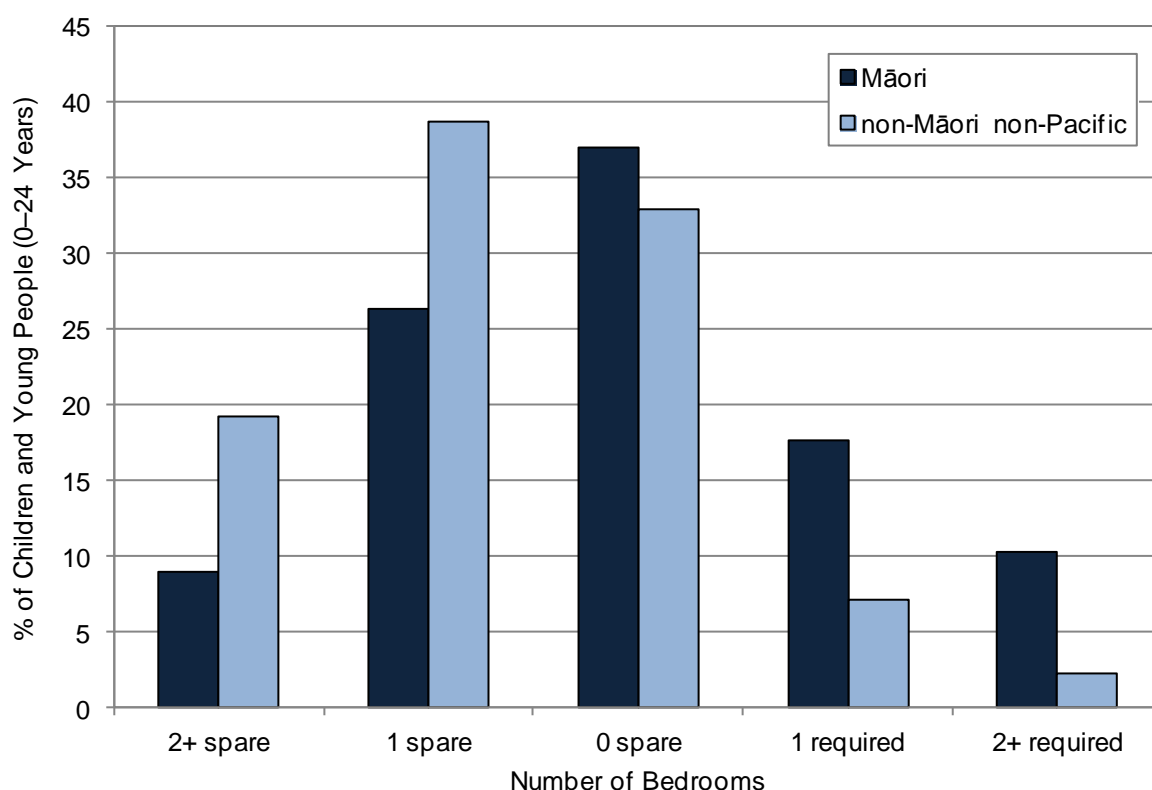
The Canadian National Occupancy Standard (CNOS), developed in Canada in the 1980s, calculates appropriate person-to-bedroom ratios for households of differing sizes and compositions. It makes judgements on appropriate age limits for bedroom sharing (e.g. using the CNOS, children aged less than 5 years of different sexes may share a room, while those aged 5–17 years may only share a room if they are of the same sex). The CNOS compares the number of bedrooms in a household with its bedroom requirements based on the age, sex, marital status and relationship of household members to one another. Households are 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 [39].



Distribution by Ethnicity

In New Zealand during 2006, 17.6% of Māori children and young people aged 0–24 years lived in households requiring one additional bedroom, while 10.2% lived in households requiring two or more additional bedrooms. The proportion of Māori children and young people (27.8%) living in crowded households (i.e. requiring one or more additional bedrooms) was *significantly* higher than for non-Māori non-Pacific children (9.3%) (**Figure 18, Table 6**).

Figure 18. Distribution of Children and Young People Aged 0–24 Years by the Canadian Crowding Index (Number of Additional Bedrooms Required by Household) and Ethnicity, New Zealand at the 2006 Census



Source: Statistics New Zealand

Table 6. Proportion of Children and Young People Aged 0–24 Years Living in Crowded Households by Ethnicity, New Zealand at the 2006 Census

Ethnicity	Number in Crowded Households at 2006 Census	Rate (%)	Rate Ratio	95% CI
Children and Young People Living in Crowded Households				
Māori	76,554	27.81	3.00	2.98–3.03
non-Māori non-Pacific	85,071	9.25	1.00	

Source: Statistics New Zealand

Distribution by Ethnicity and NZ Deprivation Index Decile

In New Zealand during 2006, the proportion of Māori children and young people living in crowded households increased with increasing NZDep deprivation, with the highest rates being seen amongst those living in the most deprived (NZDep decile 10) areas. At each level of NZDep deprivation, a higher proportion of Māori than non-Māori non-Pacific children and young people lived in crowded households (**Figure 19**).

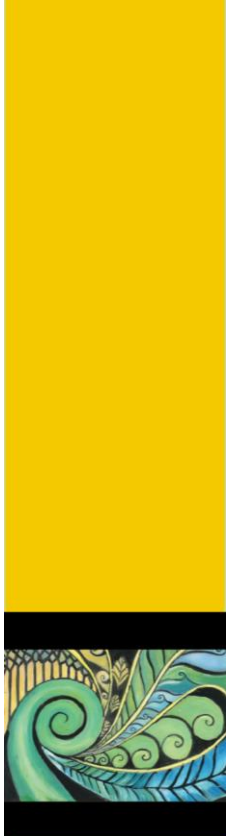
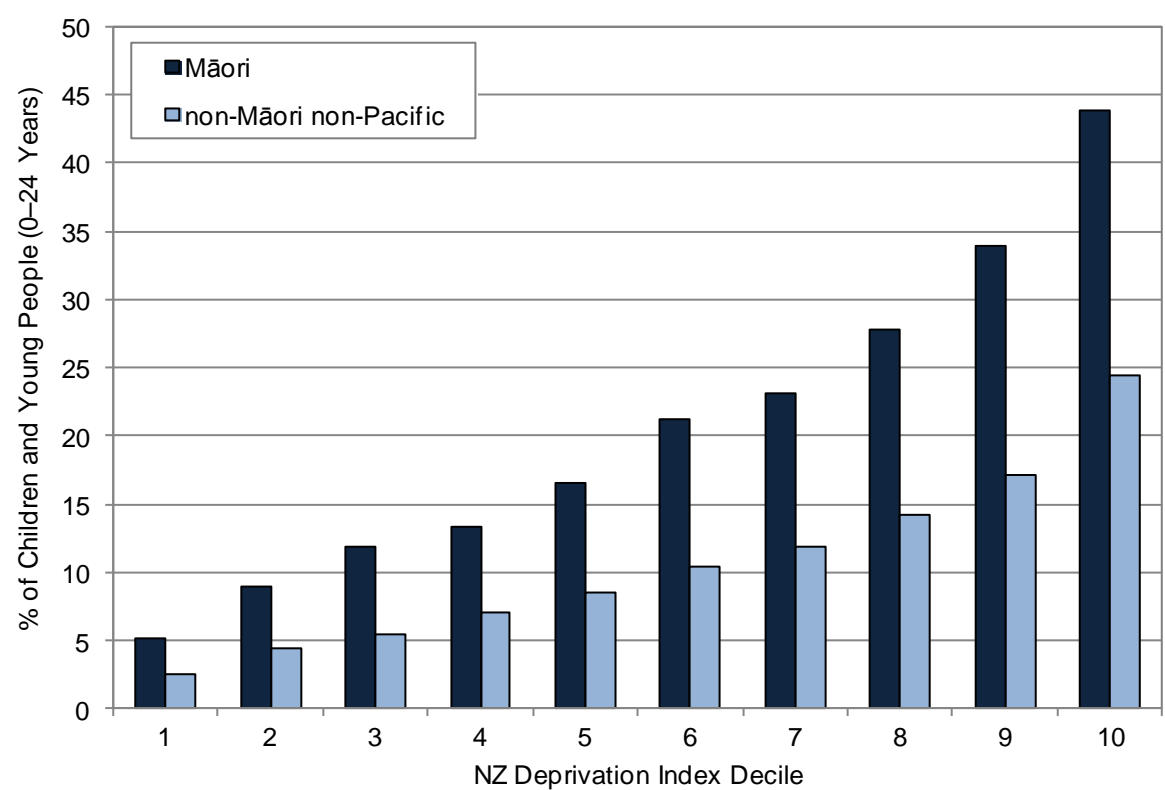
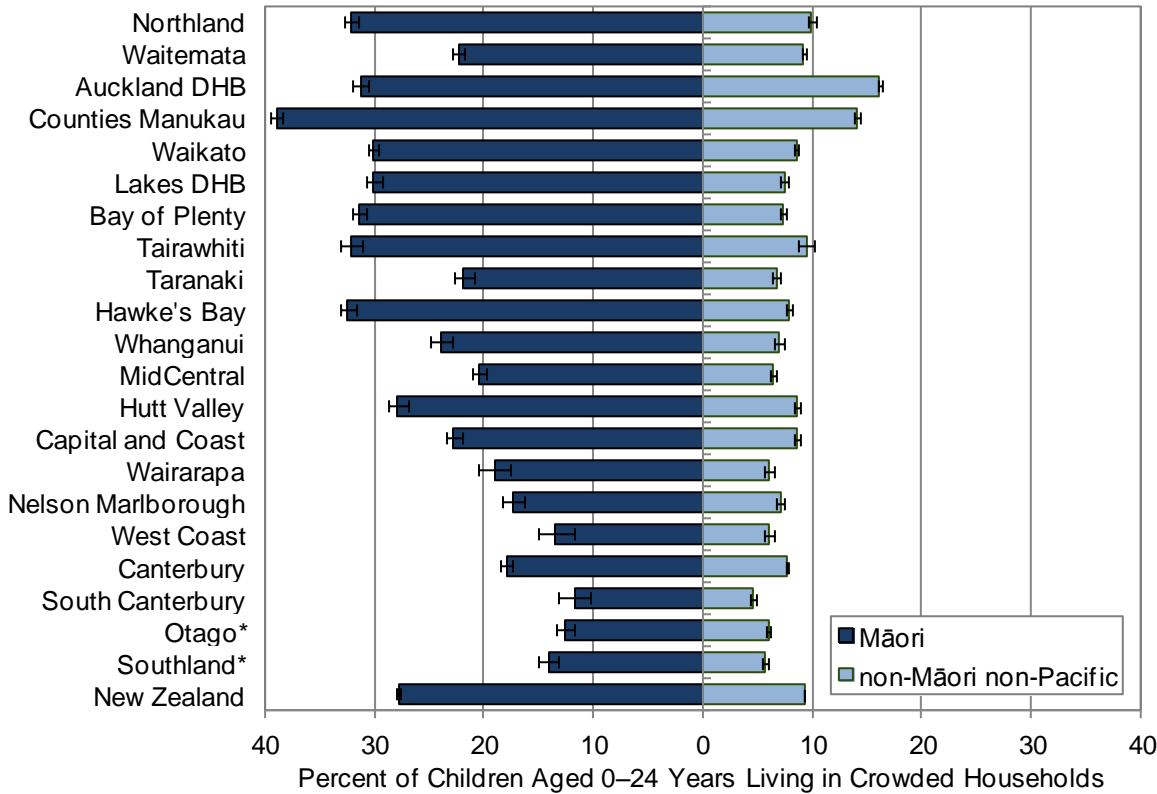


Figure 19. Proportion of Children and Young People Aged 0–24 Years Living in Crowded Households by Ethnicity and NZ Deprivation Index Decile, New Zealand at the 2006 Census



Source: Statistics New Zealand

Figure 20. Proportion of Children and Young People Aged 0–24 Years Living Crowded Households by Ethnicity and District Health Board, New Zealand at the 2006 Census



Source: Statistics New Zealand; Note: *Southern DHB

Distribution by Ethnicity and DHB

In New Zealand during 2006, the proportion of Māori children and young people living in crowded households varied by DHB, with rates ranging from 38.9% in Counties Manukau to 11.7% in South Canterbury. Within each DHB, household crowding rates were *significantly* higher for Māori than for non-Māori non-Pacific children and young people (Table 7, Figure 20).

Table 7. Proportion of Children and Young People Aged 0–24 Years Living Crowded Households by Ethnicity and District Health Board, New Zealand at the 2006 Census

District Health Board	Māori (%)	non-Māori non-Pacific (%)	Rate Ratio*	95% CI
Children and Young People Living in Crowded Households				
Northland	32.0	10.0	3.21	3.07–3.36
Waitemata	22.3	9.2	2.41	2.33–2.49
Auckland	31.3	16.2	1.94	1.87–2.00
Counties Manukau	38.9	14.1	2.76	2.69–2.82
Waikato	30.1	8.5	3.53	3.42–3.64
Lakes	30.0	7.4	4.04	3.80–4.30
Bay of Plenty	31.4	7.4	4.25	4.07–4.44
Tairāwhiti	32.1	9.5	3.40	3.11–3.71
Taranaki	21.9	6.7	3.26	3.05–3.49
Hawke's Bay	32.4	7.9	4.10	3.91–4.30
Whanganui	23.9	6.9	3.44	3.17–3.73
MidCentral	20.5	6.4	3.21	3.05–3.39
Hutt Valley	27.8	8.6	3.22	3.06–3.39
Capital and Coast	22.8	8.6	2.64	2.53–2.76
Wairarapa	19.0	6.0	3.17	2.81–3.57
Nelson Marlborough	17.4	7.1	2.46	2.28–2.65
West Coast	13.4	6.1	2.22	1.87–2.63
Canterbury	17.9	7.7	2.33	2.24–2.42
South Canterbury	11.7	4.6	2.56	2.18–3.00
Otago ⁺	12.6	6.0	2.10	1.94–2.27
Southland ⁺	14.1	5.7	2.47	2.26–2.68
New Zealand	27.8	9.3	3.00	2.98–3.03

Source: Statistics New Zealand; Note: *Rate Ratio compares rate for Māori and non-Māori non-Pacific children and young people in each DHB; ⁺Southern DHB

New Zealand Distribution

In New Zealand during 2006, 16.5% of children and young people aged 0–24 years lived in a crowded household.

Distribution by NZ Deprivation Index Decile

During this period, the proportion living in crowded households increased from 2.8% for those living in the least deprived (NZDep decile 1) areas, to 42.4% for those living in the most deprived (NZDep decile 10) areas.

Local Policy Documents and Evidence-Based Reviews Relevant to Healthy Housing

The Determinants of Health for Children and Young People in New Zealand [6] provides a brief overview of local policy documents and evidence-based reviews which consider the relationship between housing and health and the provision of healthy housing. There is a strong record of housing research in New Zealand and the overview includes some local housing intervention studies.



EDUCATION: KNOWLEDGE AND SKILLS

MĀORI MEDIUM EDUCATION

Introduction

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

Background

Cultural identity is a critical component of positive Māori development. It has been suggested that if someone identifies as Māori but is unable to access Māori language, custom, land, marae, whānau or community networks then it is unlikely that their cultural identity will be secure. A secure identity in turn is positively linked to health status, educational achievement and emotional and social adjustment [42].

Kura kaupapa Māori schools are total immersion schools designed by Māori for Māori which follow a curriculum that validates Māori knowledge, structures, processes, learning styles and learning practices. They offer a school environment that is immersed holistically in the Māori language and culture and are regarded as a key part of the strategy to assist in revitalising the Māori language and improving the participation and achievement levels of Māori in schooling [43]. They emerged in the 1970s, when aspects of Māori language and culture began to be included in mainstream programmes, although usually delivered within the context of a westernised curriculum and in the English language.

During the 1980s, schools and bilingual units (classes within schools) became established that were expected to deliver the curriculum in Māori and English. During this period, nga Kōhanga Reo (Māori language and culture preschools) also began to appear in response to calls to regenerate Māori language and culture. These offered the autonomy to deliver a curriculum along cultural lines. As the number of Kōhanga Reo graduates grew, parental demand resulted in the growth of bilingual and Māori immersion units within the primary and secondary school sector [44]. While early Kōhanga Reo and kura kaupapa Māori were privately funded, the latter were officially recognised in 1989 when they were incorporated into the state education system and became eligible for state funding [44].

Currently Māori medium education takes place across the educational spectrum:

1. Kōhanga Reo and other bilingual and immersion programmes in the ECE sector
2. Kura kaupapa Māori (Years 1–8) and wharekura (Years 1–13)
3. Immersion and other bilingual programmes in mainstream schools
4. Wānanga in the tertiary sector.

Data Source and Methods

Definition

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/>

Kura kaupapa Māori are schools where the teaching is in the Māori language and the school's aims, purposes and objectives reflect the Te Aho Matua philosophy. Kura teina were initiatives by communities wishing to develop a kura kaupapa Māori, which 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 [45]. Prior to 2001, kura teina were not counted as separate schools, and after 2010 they ceased to exist.



Enrolments in Māori Medium Early Childhood Education

In New Zealand, the number of enrolments in licensed Te Kōhanga Reo declined from 10,389 in 2002, to 9,165 in 2008, before increasing again to 9,631 in 2011. A number of children also attended Ngā Puna Kōhungahunga and licence-exempt Te Kōhanga Reo during this period (**Table 8**).

Table 8. Enrolments in Māori Medium Early Childhood Education by Type, New Zealand 2002–2011

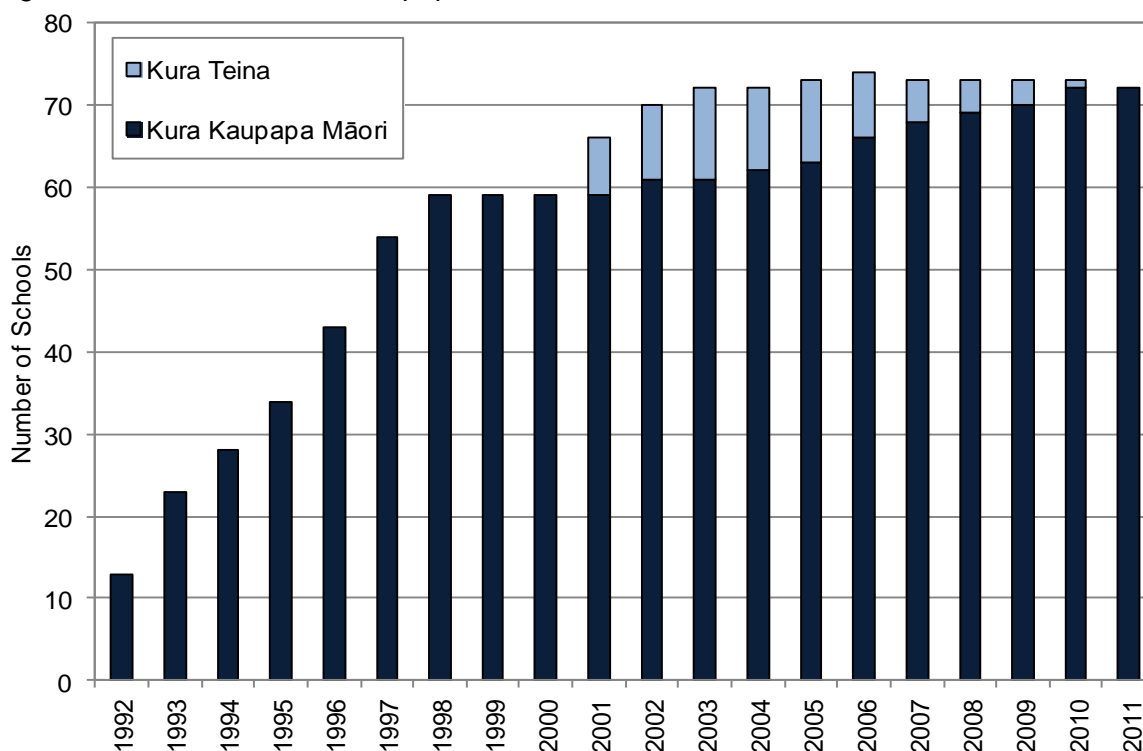
Year	Licensed Te Kōhanga Reo	Ngā Puna Kōhungahunga	Licence-Exempt Te Kōhanga Reo
2002	10,389	351	138
2003	10,319	408	130
2004	10,418	580	191
2005	10,070	519	146
2006	9,493	289	89
2007	9,236	343	69
2008	9,165	454	43
2009	9,288	277	0
2010	9,370	283	0
2011	9,631	278	0

Source: Ministry of Education

Number of Kura Kaupapa Māori and Kura Teina

In New Zealand since 1992, there has been a 4.5-fold increase in the number of kura kaupapa Māori and kura teina, with numbers increasing from 13 in 1992, to 72 in 2011. The most dramatic increases occurred during the 1990s however, with the rate of growth flattening off after 2003 (**Figure 21**).

Figure 21. Number of Kura Kaupapa Māori and Kura Teina, New Zealand 1992–2011

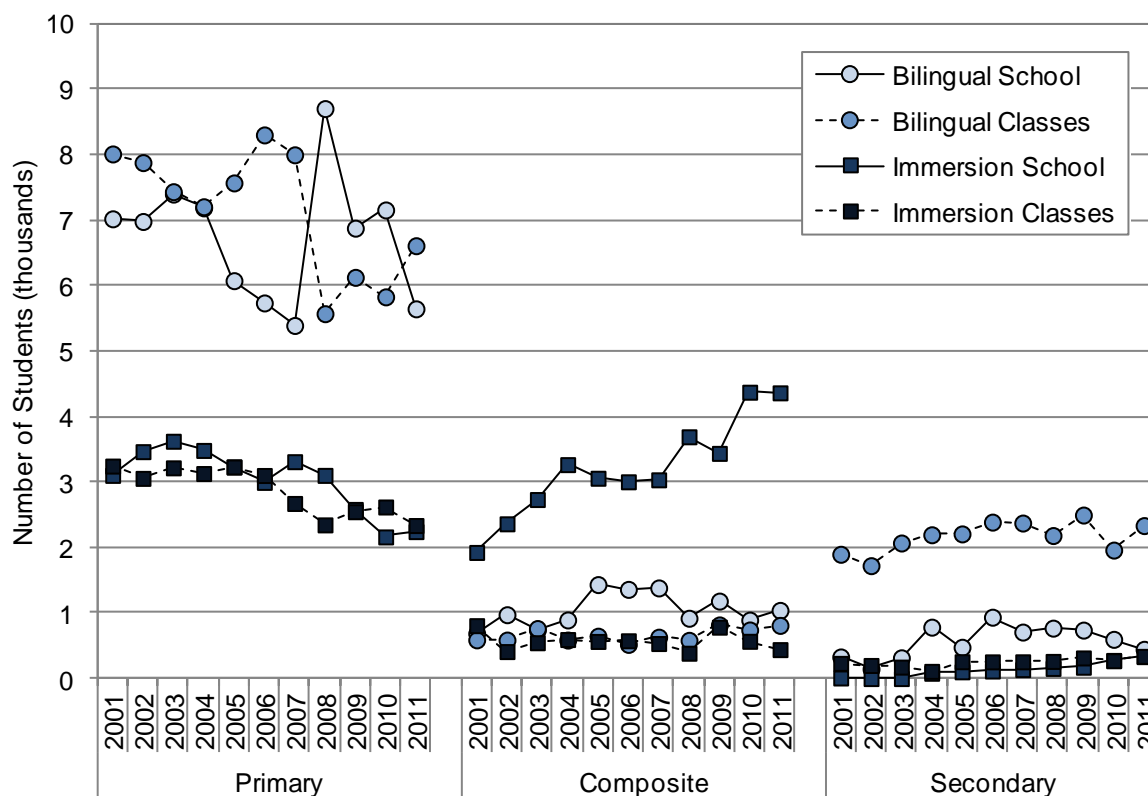


Source: Ministry of Education; Note: Prior to 2001 Kura Teina were not counted as separate schools; Kura Teina no longer existed after 2010

Māori Medium Education

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, as a result of attending a bilingual school or an immersion/bilingual class in a primary or secondary school setting (**Figure 22** and **Table 9**).

Figure 22. Number of Students Involved in Māori Medium Education by School Sector and Form of Education as at 1 July, New Zealand 2001–2011



Source: Ministry of Education

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

The Determinants of Health for Children and Young People in New Zealand [6] provides a brief overview of local policy documents and other reviews which consider initiatives to improve educational participation and attainment for Māori students.

Table 9. Number of Students (Māori and non-Māori) Involved in Māori-Medium Education by Regional Council and Highest Level of Learning, New Zealand July 2011

Regional Council	Level of Learning								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	1,146	37	655	74	726	74	734	192	3,261
Auckland	47	2,049	57	883	154	1,126	377	552	635	4,610
Waikato	10	2,202	19	385	21	331	204	541	254	3,459
Bay of Plenty	7	2,546	50	903	56	684	466	1,321	579	5,454
Gisborne	5	736	<5	137	19	370	23	403	51	1,646
Hawke’s Bay	<5	730	15	346	5	335	17	175	40	1,586
Taranaki	<5	170	0	90	21	102	32	61	55	423
Manawatu-Wanganui	8	712	27	404	58	390	93	267	186	1,773
Wellington	13	1,065	7	146	17	138	65	142	102	1,491
Tasman	0	0	<5	47	0	0	0	0	<5	47
Nelson	0	0	38	180	0	0	0	0	38	180
Marlborough	0	0	0	0	11	12	0	0	11	12
Canterbury	5	216	25	176	63	89	6	11	99	492
West Coast	0	0	13	20	0	0	22	<5	35	23
Otago	0	7	<5	18	0	5	0	<5	<5	33
Southland	<5	131	9	33	0	0	0	48	10	212
New Zealand	108	11,710	306	4,423	499	4,308	1,379	4,261	2,292	24,702

Source: Ministry of Education

EARLY CHILDHOOD EDUCATION

Introduction

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

Background

Participation in high quality early childhood education (ECE) has significant long term benefits for children's academic performance, as well as school readiness, reduced grade retention and reduced special education placement [46]. Competencies and skills that enable children to keep learning have also been found to be associated with ECE participation. The benefits appear greatest for children from low income families, those who attend ECE regularly and those who have started ECE at a younger age (e.g. 2-3 years). A number of longitudinal studies however, have suggested that the relationship between ECE and subsequent outcomes may be complex and related to the age at which the child starts ECE, the number of hours in ECE each week, the quality of the ECE service and the socioeconomic background from which the child comes [47].

In New Zealand, early childhood education is provided by a variety of services including te kōhanga reo, kindergartens, home-based services and education and care services. A recent review by the Education Review Office [48] however, noted that the majority of Māori children (76 percent) participating in ECE did so in mainstream early childhood services. The report identified a number of issues with the way mainstream services responded to the needs of the parents and whānau of Māori children. In particular the report noted that while most ECE services had processes for consulting and communicating with families, less than half (41%) were using these processes to identify and respond to the aspirations and expectations of the parents and whānau of Māori children. Further, the report found that many managers and educators did not yet fully recognise the importance of acknowledging Māori children's cultural identity and heritage. The report made a number of recommendations as to how the provision of early childhood services for Māori children might be improved [48].

Data Source and Methods

Definitions

1. Number of enrolments in licensed early childhood education services
2. Average weekly hours attended by children at licensed early childhood education services
3. Proportion of new entrants who had previously attended early childhood education

Data Source

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

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

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.

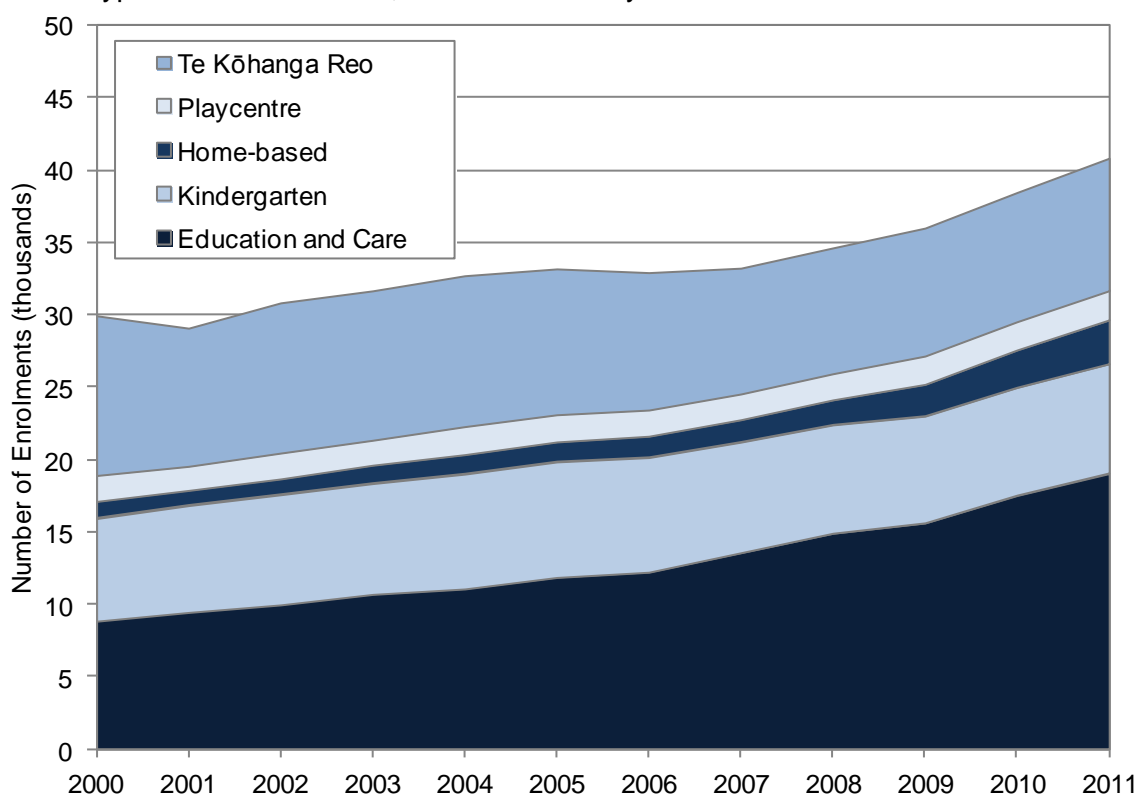
School Socioeconomic Decile: All schools are assigned a decile ranking based on the socioeconomic status of the areas they serve. These rankings are based on Census data from families with school age children in the areas from which the school draws its students. Census variables used in the ranking 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

Trends by Service Type

In New Zealand during 2000–2011, education and care, te kōhanga reo and kindergartens were the types of ECE most frequently used by Māori children, with the overall number of enrolments in ECE for Māori children increasing by 36.3% during this period (from 29,961 in 2000 to 40,833 in 2011). Changes varied markedly by service type however, with enrolments in education and care increasing by 114.1% and enrolments in kindergartens increasing by 6.3%. In contrast, enrolments in Te Kōhanga Reo decreased by 17.0% (Figure 23).

Figure 23. Number of Enrolments in Licensed Early Childhood Education Services by Service Type for Māori Children, New Zealand July 2000–2011



Source: Ministry of Education; Note: Data is for Māori children only

New Zealand Distribution

Hours Spent in Early Childhood Education

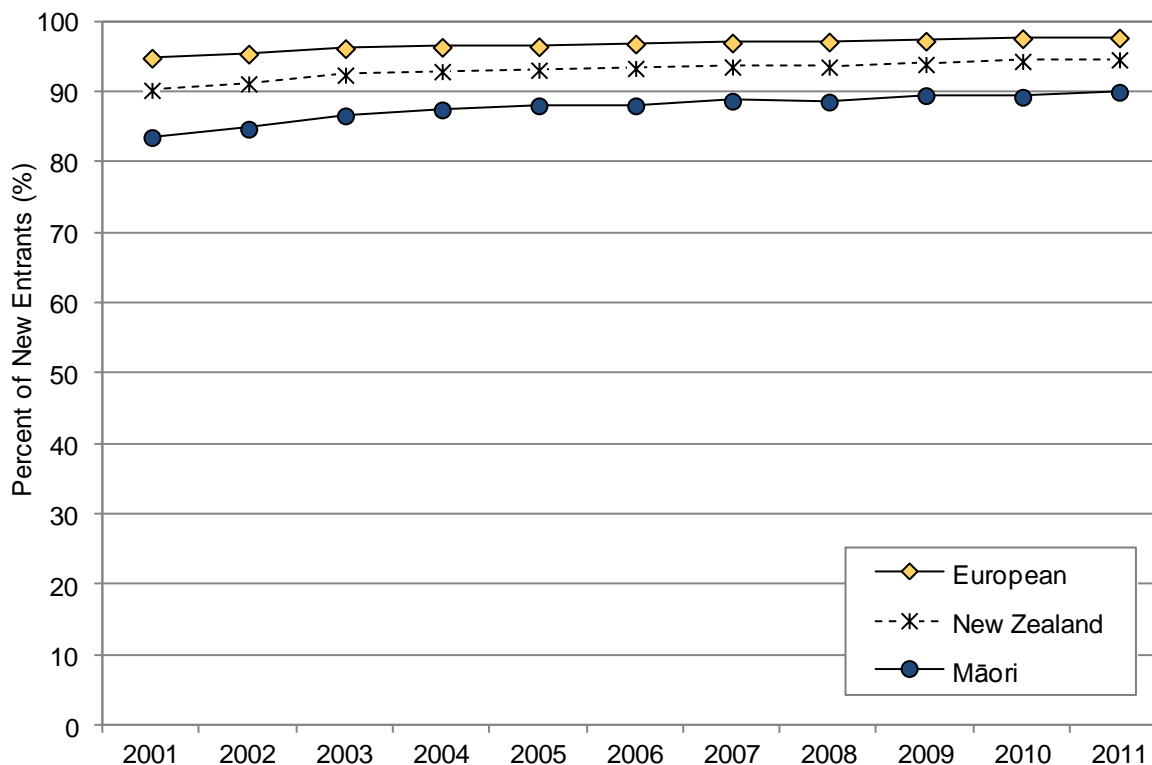
In addition to an increase in overall ECE enrolments, the average number of hours spent in ECE nationally increased for all service types during 2000–2011, with the exception of Playcentres. The average number of hours spent increased from 16.2 hours in 2000 to 23.9 hours in 2011 for Education and Care facilities, from 11.2 hours to 15.5 hours for Kindergartens, and from 16.7 hours to 21.9 hours for home-based care.

Prior Participation in Early Childhood Education

Distribution by Ethnicity

In New Zealand, the proportion of Māori new entrants reporting participation in ECE prior to school entry increased, from 83.6% in 2001 to 90.0% in 2011, with the most rapid increases occurring during the early 2000s. Throughout this period, prior participation in ECE remained lower for Māori than for European children (**Figure 24**).

Figure 24. Proportion of New Entrants who had Previously Attended Early Childhood Education by Ethnicity, New Zealand 2001–2011

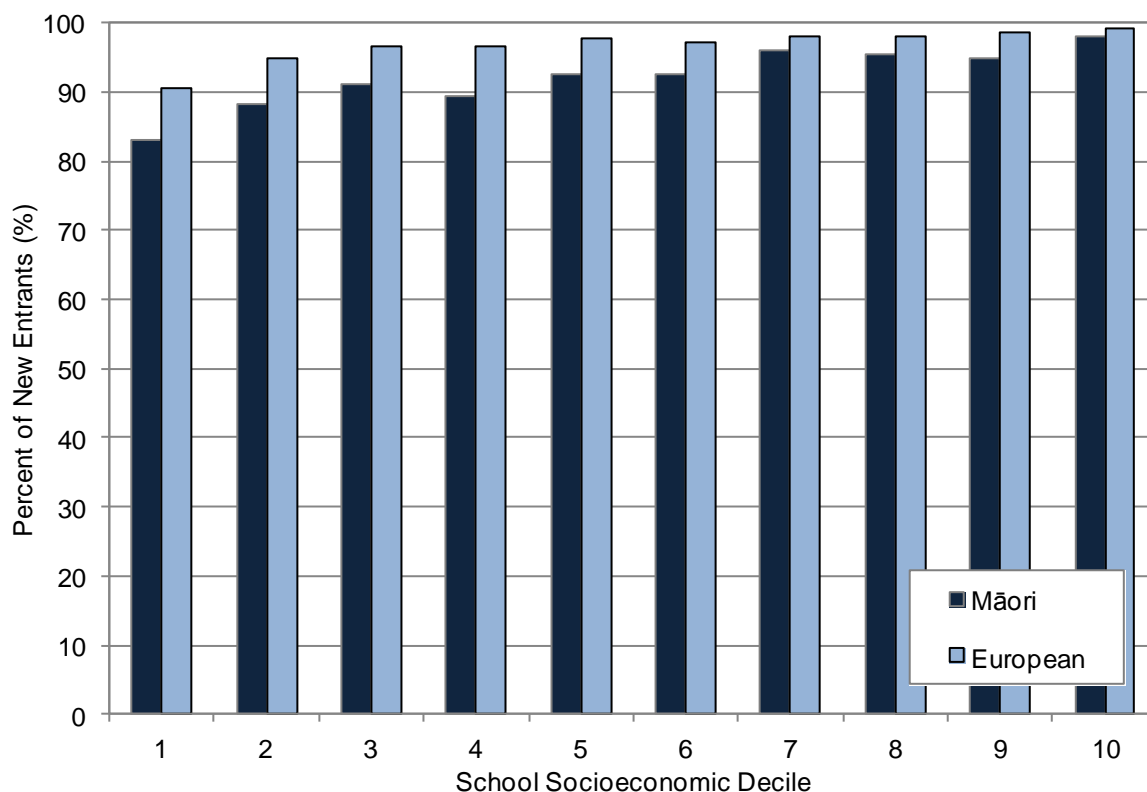


Source: Ministry of Education; Note: Ethnicity is Total Response and thus individual children may appear in more than one ethnic group

Distribution by School Socioeconomic Decile

In New Zealand during June 2011, the proportion of Māori children reporting participation in ECE prior to school entry increased as the deprivation of the school's catchment decreased, with the highest rates of prior participation in ECE being seen in Māori children attending schools in the least deprived (decile 10) areas. Within each school socioeconomic decile, the proportion of Māori children who had attended ECE prior to school entry was lower than for European children (**Figure 25**).

Figure 25. Proportion of New Entrants who had Previously Attended Early Childhood Education by Ethnicity and School Socioeconomic Decile, New Zealand June 2011



Source: Ministry of Education; Note: Decile 1 = Most deprived; Decile 10 = Least deprived; Ethnicity is Total Response and thus individual children may appear in more than one ethnic group

Distribution by Ethnicity and DHB

In New Zealand during 2011, the proportion of Māori new entrants reporting participation in ECE prior to school entry varied by DHB, with rates ranging from 81.7% in Counties Manukau to 95.8% in Canterbury (**Table 10**).

New Zealand Distribution

Distribution by School Socioeconomic Decile

In New Zealand during 2011, 18.0% of children attending schools in the most deprived (decile 1) areas had not attended ECE prior to school entry, as compared to only 1.0% of children attending schools in the least deprived (decile 10) areas. Nevertheless these figures suggest that on average, 82.0% of children attending schools in the most deprived areas had attended some form of ECE prior to school entry.

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

The Determinants of Health for Children and Young People in New Zealand [6] provides a brief overview of local policy documents and evidence-based reviews which are relevant to Early Childhood Education.

Table 10. Proportion of New Entrants who had Previously Attended Early Childhood Education by Ethnicity and District Health Board, New Zealand 2011

District Health Board	Māori	European	Total
Prior Participation in Early Childhood Education (%)			
Northland	83.3	94.4	89.1
Waitemata	91.4	98.5	96.0
Auckland	87.4	98.5	94.4
Counties Manukau	81.7	97.0	88.4
Waikato	89.1	97.3	94.2
Lakes	89.5	96.3	92.7
Bay of Plenty	92.4	97.7	95.4
Tairāwhiti	91.2	97.9	93.7
Taranaki	94.3	98.0	97.2
Hawke's Bay	93.3	98.7	96.2
MidCentral	94.4	97.6	96.7
Whanganui	94.5	98.2	96.4
Hutt Valley	91.7	97.7	95.7
Capital and Coast	93.8	98.8	97.0
Wairarapa	95.2	98.0	97.8
Nelson Marlborough	95.0	97.8	97.4
South Canterbury	95.4	96.9	96.8
Canterbury	95.8	98.8	98.1
West Coast	94.8	93.8	94.1
Southern	95.4	97.1	96.7
New Zealand	90.0	97.8	94.7

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



HIGHEST EDUCATIONAL ATTAINMENT AT SCHOOL LEAVING

Introduction

The following section uses information from the Ministry of Education to review the highest educational attainment of Māori school leavers during 2009–2011.

Background

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. In this context, it is encouraging to note that during 2009–2011, the proportion of Māori students who left school with no qualification fell, from 38.2% in 2009, to 31.4% in 2011, while the proportion leaving school with a University Entrance Standard increased, from 18.4% in 2009, to 23.4% in 2011. However, despite these changes, the proportion of Māori students leaving school with no formal qualifications remained higher than for European students, while the proportion leaving with a University Entrance Standard remained lower [49].

Research however, indicates a number of determinants affect children's educational attainment either positively or negatively. These include socioeconomic factors, parental occupational class, family mobility, and family income (especially during a child's pre-school years). The interaction between these factors is often complex, with examples of positive influences on children's educational attainment including higher parental education, especially maternal education, with associated facilities for studying, and easy access to computers and other resources [50].

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, with the recent report from the New Zealand based Iterative Best Evidence Syntheses (BES) Programme [51] identifying a number of systemic improvements which would assist national educational priorities to be met. In this context, the critical components for achieving valued learning are inter-connected and include school leadership, teacher professional learning and development, and the provision of quality teaching for diverse (all) learners. The report thus notes that *“To understand teaching, professional learning, and leadership without activating educationally powerful connections with the lives, identities, families and communities of diverse learners will not be enough”* (p. 12).

Data Source and Methods

Definition

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

The National Certificate of Educational Achievement (NCEA) is part of the National Qualifications Framework and has replaced School Certificate, Sixth Form Certificate, University Entrance and University Bursaries qualifications. 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, Level 3 NCEA replaced Higher School Certificate and University Entrance/University Bursaries. In 2004 a new 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. For further detail see <http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/understanding-ncea/the-facts/factsheet-4/>

Data Source

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

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

Notes on Interpretation

Note 1: This data follows a new definition of school leavers, from the Ministry of Education's ENROL system and is only available from 2009 onwards. Thus comparisons with previous years are not possible.

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

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

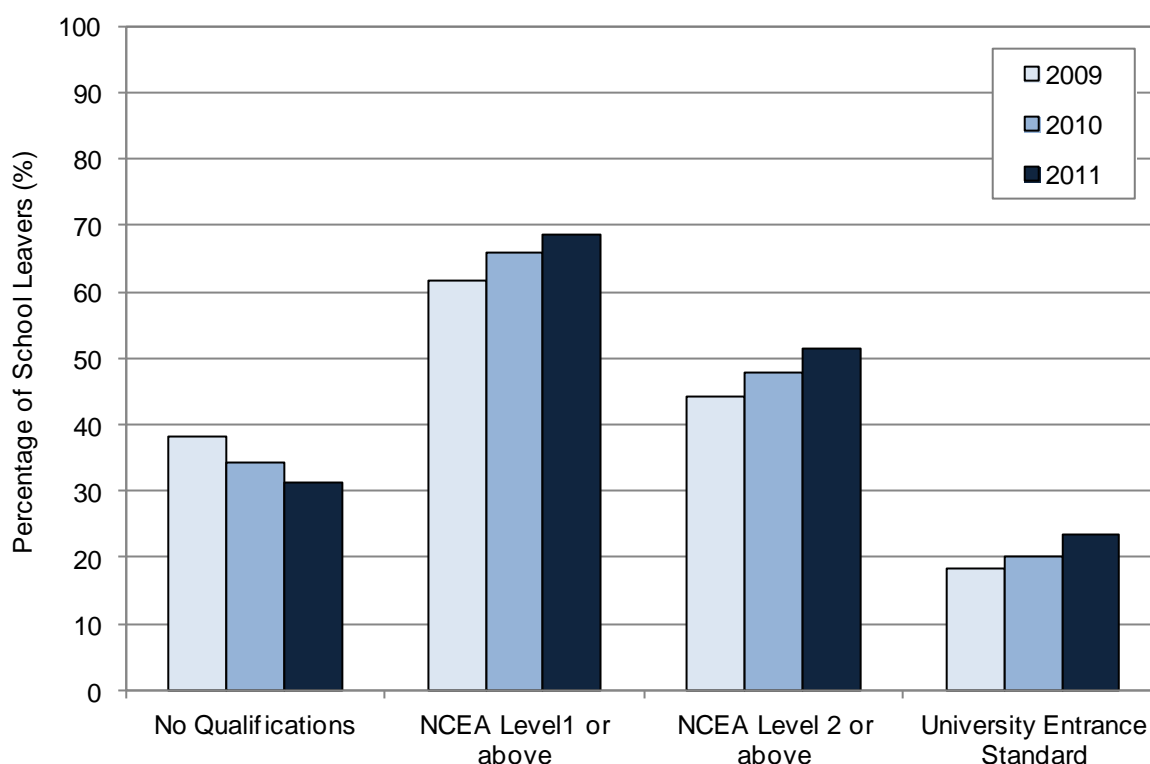
School Socioeconomic Decile: All schools are assigned a decile ranking based on the socioeconomic status of the areas they serve. These rankings are based on Census data from families with school age children in the areas from which the school draws its students. Census variables used in the ranking 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.



Distribution by Ethnicity

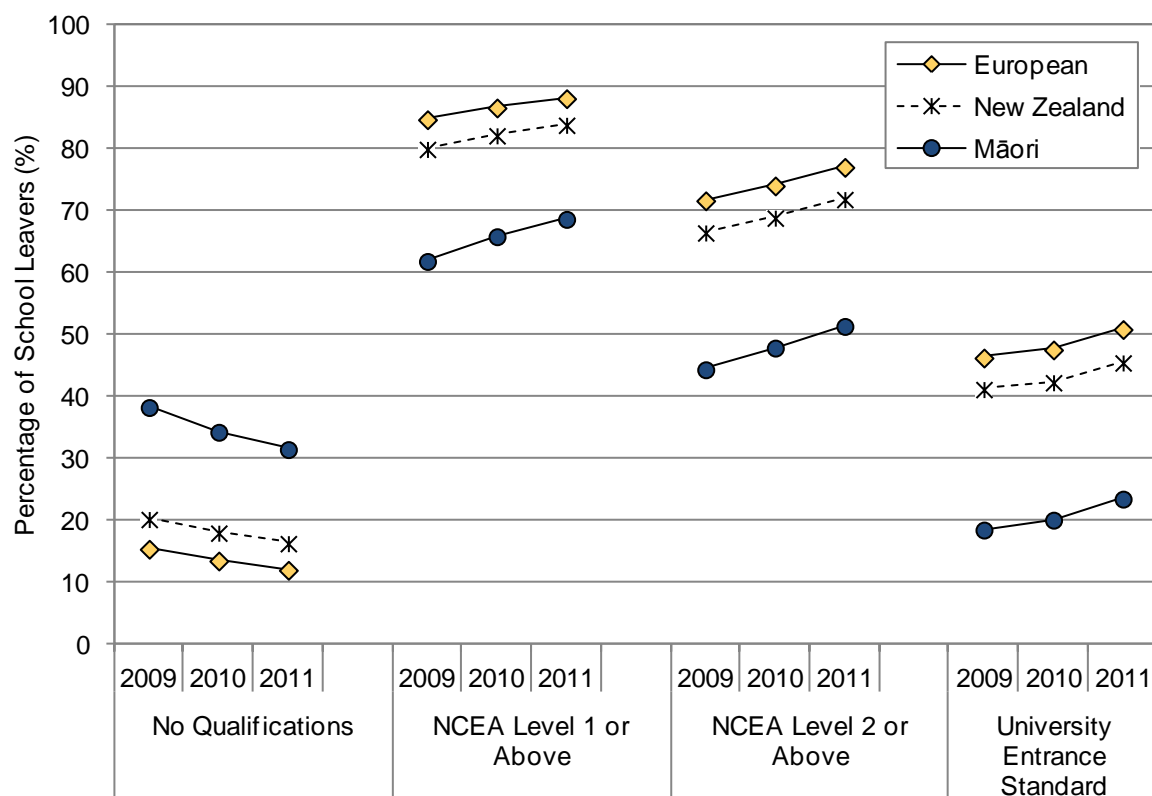
In New Zealand during 2009–2011, the proportion of Māori students leaving school with no qualifications declined, from 38.2% in 2009, to 31.4% in 2011, while the proportion leaving school with a University Entrance standard increased, from 18.4% in 2009, to 23.4% in 2011 (**Figure 26**). The proportion of Māori students leaving school with no qualifications however, remained higher than for European students during this period, while the proportion leaving with a University Entrance standard remained lower (**Figure 27**).

Figure 26. Highest Educational Attainment of Māori School Leavers, New Zealand 2009–2011



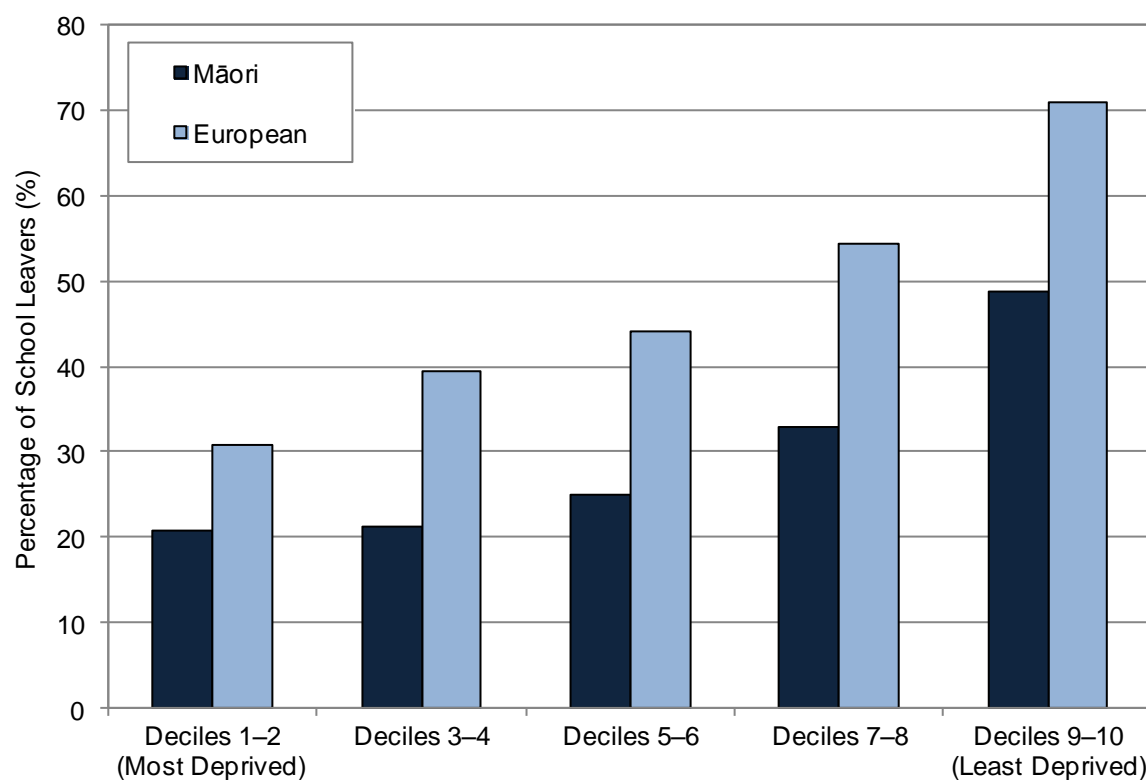
Source: Ministry of Education; Note: Data is for Māori students only

Figure 27. Highest Educational Attainment of School Leavers by Ethnicity, New Zealand 2009–2011



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

Figure 28. School Leavers with a University Entrance Standard by Ethnicity and School Socioeconomic Decile, New Zealand 2011



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

Distribution by Ethnicity and School Socioeconomic Decile

In New Zealand during 2011, while the proportion of Māori students achieving a University Entrance standard increased with increasing school socioeconomic decile, at each level of socioeconomic deprivation, a lower proportion of Māori than European students attained a University Entrance standard (**Figure 28**).

Distribution by Ethnicity and DHB

In New Zealand during 2011, the proportion of Māori students leaving school with no qualifications varied by DHB, with rates ranging from 16.0% in the Wairarapa, to 34.4% in Counties Manukau (**Table 11**). Similarly, the proportion of Māori students leaving school with a University Entrance standard ranged from 15.3% in the West Coast, to 35.7% in Auckland DHB (**Table 12**).

Table 11. Proportion of School Leavers with No Qualifications by Ethnicity and District Health Board, New Zealand 2011

District Health Board	Māori	European	Total
Proportion Leaving School with No Qualifications (%)			
Northland	25.8	11.3	17.2
Waitemata	22.6	8.4	11.6
Auckland	19.2	4.3	8.2
Counties Manukau	34.4	10.6	16.8
Waikato	32.4	11.4	17.1
Bay of Plenty	25.8	8.4	13.9
Lakes	23.8	9.6	15.8
Tairāwhiti	26.2	7.0	18.8
Taranaki	26.2	7.6	11.7
Hawke's Bay	26.4	9.2	14.7
MidCentral	25.0	9.6	14.1
Whanganui	24.4	9.9	13.8
Hutt Valley	20.9	11.3	14.1
Capital and Coast	17.3	6.3	9.0
Wairarapa	16.0	7.3	10.0
Nelson Marlborough	24.7	10.1	12.1
West Coast	30.6	13.1	15.9
Canterbury	26.6	11.3	13.0
South Canterbury	16.7	9.8	10.2
Southern	25.2	9.8	11.4
New Zealand	31.4	11.9	16.2

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



Table 12. Proportion of School Leavers with a University Entrance Standard by Ethnicity and District Health Board, New Zealand 2011

District Health Board	Māori	European	Total
Proportion Leaving School with a University Entrance Standard (%)			
Northland	23.7	42.6	35.3
Waitemata	32.8	59.7	55.6
Auckland	35.7	70.2	59.6
Counties Manukau	22.0	54.8	44.0
Waikato	19.2	45.1	39.2
Bay of Plenty	26.7	52.0	44.6
Lakes	25.2	47.9	39.2
Tairāwhiti	28.6	45.4	35.4
Taranaki	21.4	45.5	41.0
Hawke's Bay	27.4	56.7	46.8
MidCentral	25.3	48.4	43.0
Whanganui	30.7	58.2	50.2
Hutt Valley	23.6	52.2	45.2
Capital and Coast	31.0	63.2	56.8
Wairarapa	29.0	54.2	48.4
Nelson Marlborough	26.7	48.9	46.0
West Coast	15.3	35.3	31.4
Canterbury	26.3	52.6	50.6
South Canterbury	27.8	45.3	42.9
Southern	27.9	50.3	48.3
New Zealand	23.4	50.8	45.4

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

New Zealand Distribution

In New Zealand during 2011, 16.2% of students left school with no formal qualifications, while 83.8% left with NCEA Level 1 or above, 71.8% left with NCEA Level 2 or above and 45.4% attained a University Entrance standard. While the proportion of students leaving with no formal qualifications declined during 2009–2011, the proportion attaining a University Entrance standard increased.

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

The Determinants of Health for Children and Young People in New Zealand [6] provides a brief overview of local policy documents and evidence-based reviews which consider strategies to improve student's educational attainment.

SENIOR SECONDARY SCHOOL RETENTION AND TERTIARY PARTICIPATION

Introduction

The following section uses Ministry of Education data to review the proportion of Māori senior secondary school students staying on at school until at least seventeen years of age. In addition, tertiary participation rates are reviewed, in order to provide some context for interpreting ethnic differences in senior secondary school retention rates.

Background

A key factor for academic achievement at secondary school level is participation. To achieve, students need to be at school, experience a sense of belonging, and stay interested and engaged in learning. Research suggests that there are strong correlations between early school leaving, unemployment and lower incomes, and that these in turn influence later socioeconomic position [52].

Not all students who leave school prior to 18 years of age, or without formal qualifications however, transition directly into the workforce, with many taking part in other forms of tertiary education. The participation rate of Māori students in tertiary education has more than doubled since 1998, with Māori now participating in tertiary education at a much higher rate than non-Māori [53]. After adjusting for differences in age distribution, 16.7% of Māori aged 15 years and over participated in tertiary education in 2010, as compared to 12.1% of Asian, 11.2% of European/Pākehā and 12.3% of Pasifika peoples. When broken down by level of study, Māori students had substantially higher rates of participation at non-degree level, while non-Māori participation rates were highest at degree level and above [53].

Senior Secondary School Retention

Data Source and Methods

Definition

1. The proportion of secondary school students staying on at school until at least seventeen years of age
2. Age standardised participation rates in tertiary education

Data Source

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

Ministry of Education: ENROL

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

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

Notes on Interpretation

Note 1: From 2009 a new way of categorising school leavers has been used which 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.

For further detail see

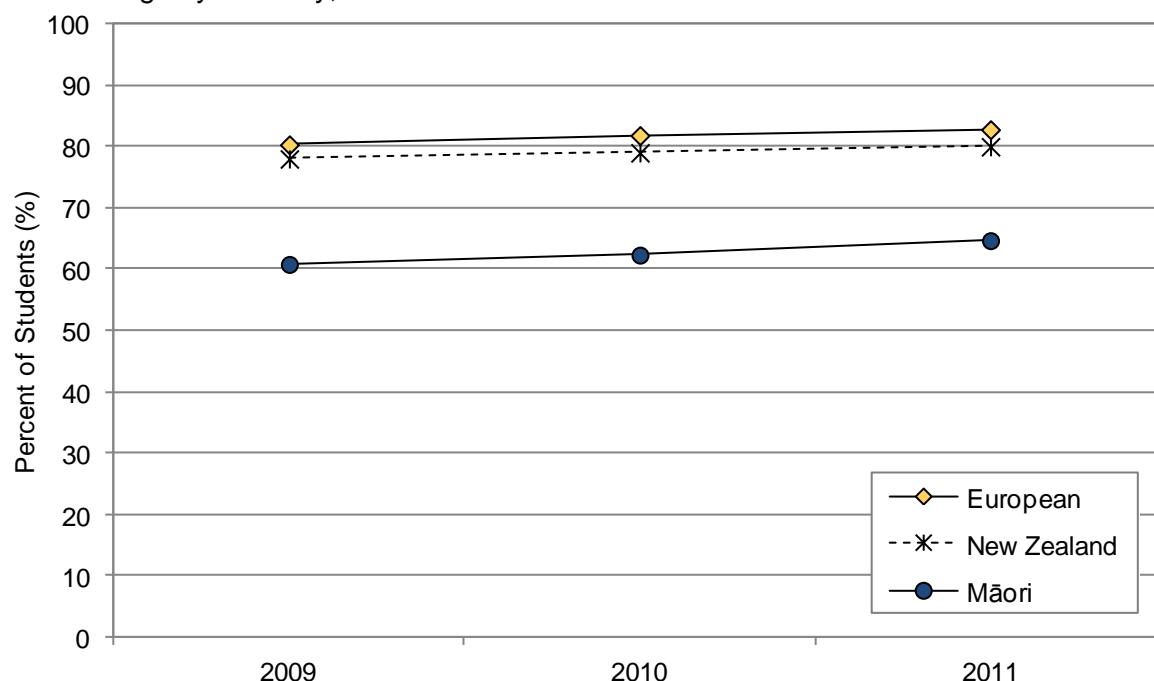
<http://www.educationcounts.govt.nz/indicators/definition/student-engagement-participation/3945>

Distribution by Ethnicity

In New Zealand during 2009–2011, the proportion of Māori students staying on at school until at least 17 years of age increased, from 60.8% in 2009 to 64.7% in 2011. Throughout this period, the proportion of Māori students staying on at school until at least 17 years remained lower than for European students (**Figure 29**).



Figure 29. Proportion of Secondary School Students Staying at School Until at Least 17 Years of Age by Ethnicity, New Zealand 2009–2011



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

Table 13. Proportion of Secondary School Students Staying on at School Until at Least 17 Years of Age by Ethnicity and District Health Board, New Zealand 2011

District Health Board	Māori	European	Total
Retention Until at Least 17 Years per 100 Students (%)			
Northland	65.5	79.8	73.6
Waitemata	73.2	88.5	86.9
Auckland	74.8	89.8	87.1
Counties Manukau	60.2	82.3	80.5
Waikato	61.8	79.4	75.7
Bay of Plenty	65.9	80.4	76.1
Lakes	63.5	78.0	72.9
Tairāwhiti	70.7	85.2	76.5
Taranaki	68.4	81.6	78.6
Hawke's Bay	63.6	86.0	79.2
MidCentral	70.9	82.6	80.1
Whanganui	67.8	83.2	79.6
Hutt Valley	75.3	86.6	84.8
Capital and Coast	78.0	88.7	87.6
Wairarapa	67.9	86.2	81.4
Nelson Marlborough	70.1	82.1	80.9
West Coast	52.8	64.4	64.0
Canterbury	68.2	82.6	82.0
South Canterbury	79.2	80.2	80.2
Southern	66.5	81.9	81.0
New Zealand	64.7	82.8	80.0

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

Distribution by Ethnicity and DHB

In New Zealand during 2011, the proportion of Māori students staying on at school until at least 17 years of age varied by DHB, with rates ranging from 52.8% on the West Coast, to 79.2% in South Canterbury (**Table 13**).

Participation in Tertiary Education

Data Source and Methods

Definition

1. Age standardised participation rates in tertiary education

Ministry of Education

Numerator: The total number of students 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 estimated New Zealand population aged 15 years and over, as at 30 June of each year.

Notes on Interpretation

Note 1: 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 2010 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 2: Data relates to domestic students enrolled at any time during the year with a tertiary education provider in formal qualifications of greater than 0.03 Full Time Equivalents. Students who were enrolled at more than one qualification level have been counted in each level, but only once in the Total.

Note 3: Data excludes all non-formal learning and on-job industry training.

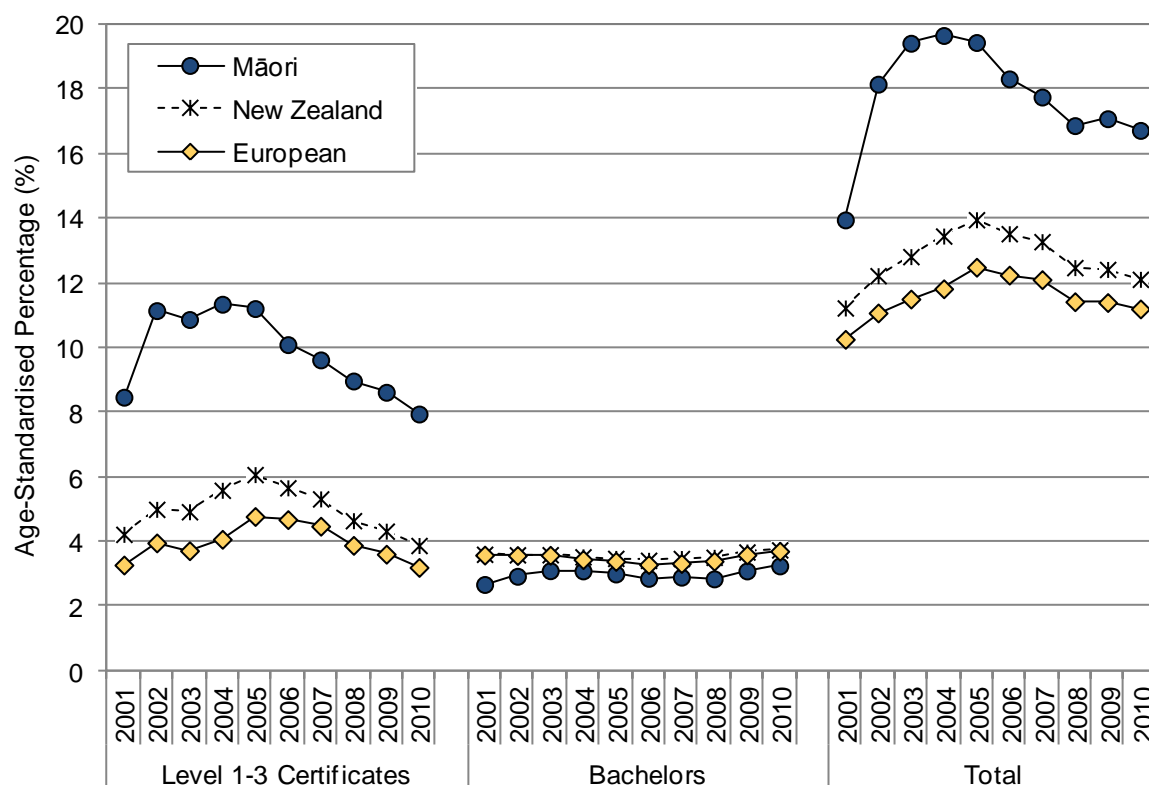
Distribution by Ethnicity

Ethnic differences in school retention at 17 years need to be viewed in the context of the alternative educational opportunities available to students. During 2001–2010, a large number of Māori students participated in tertiary education, with participation rates for Māori students being particularly high in Certificate Level 1–3 courses (**Figure 30**). While tertiary participation rates also include those 25+ years, such figures suggest that for many, participation in formal education does not cease at school leaving, although 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 which occur after 17 years of age, when young people move from regional areas to large urban centres to take advantage of tertiary study opportunities. Thus 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 these regions, and/or who return to the region during their study breaks or vacations.



Figure 30. Age-Standardised Participation Rates in Tertiary Education for Domestic Students by Ethnicity and Selected Qualification, New Zealand 2001–2010



Source: Ministry of Education; Note: Ethnicity is Total Response and thus individual students may appear in more than one ethnic group; Total also includes Level 4 Certificates, Diplomas, Level 7 Graduate Certificates/Diplomas, Level 8 Honours/Postgraduate Certificates/Diplomas, Masters, and Doctorates

Local Policy Documents and Evidence-Based Reviews Relevant to Educational Participation

The Determinants of Health for Children and Young People in New Zealand [6] provides a brief overview of local policy documents and evidence-based reviews relevant to educational participation in young people.

SCHOOL STAND-DOWNS, SUSPENSIONS, EXCLUSIONS AND EXPULSIONS

Introduction

The following section uses information from the Ministry of Education's Stand-down and Suspension database to review the proportion of Māori students who were stood-down, suspended, excluded or expelled from school during 2000–2011.

Background

Participation in secondary school is vital for academic achievement, with factors that interrupt participation potentially impacting on students' educational outcomes. In New Zealand schools, stand-downs, suspensions, exclusions and expulsions are ways in which the system deals with student behaviour that disrupts the learning and wellbeing of other students or staff. These approaches are not used lightly, with the intention being to help students return to productive learning and relationships within the school community [54].

In New Zealand, there has been a gradual decline in suspension rates amongst Māori students, with age standardised rates falling from 15.3 per 1,000 in 2006, to 11.4 per 1,000 in 2011. Despite this, in 2011 suspension rates for Māori students remained higher than for European students (3.4 per 1,000) [55], with the most common reasons for suspensions being for issues related to student conduct, including continual disobedience, physical or verbal assaults on staff or other students, and for other harmful or dangerous behaviours. In addition, a significant number of students were suspended or excluded as a result of alcohol, drug use, or cigarette smoking [54].

While for the majority of students a stand-down or suspension was a one off event, with the time spent away from school being fairly limited (e.g. a few days–weeks), both New Zealand and overseas research suggest that adolescent 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 [56]. Thus the Ministry of Education provides a range of Good Practice guidelines for schools on alternative methods of improving engagement in schooling, in preference to students being suspended [57].

Data Source and Methods

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 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.

Data Source

Ministry of Education

<http://www.educationcounts.govt.nz/indicators/main/student-engagement-participation/80346>

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.

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 [55].

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.

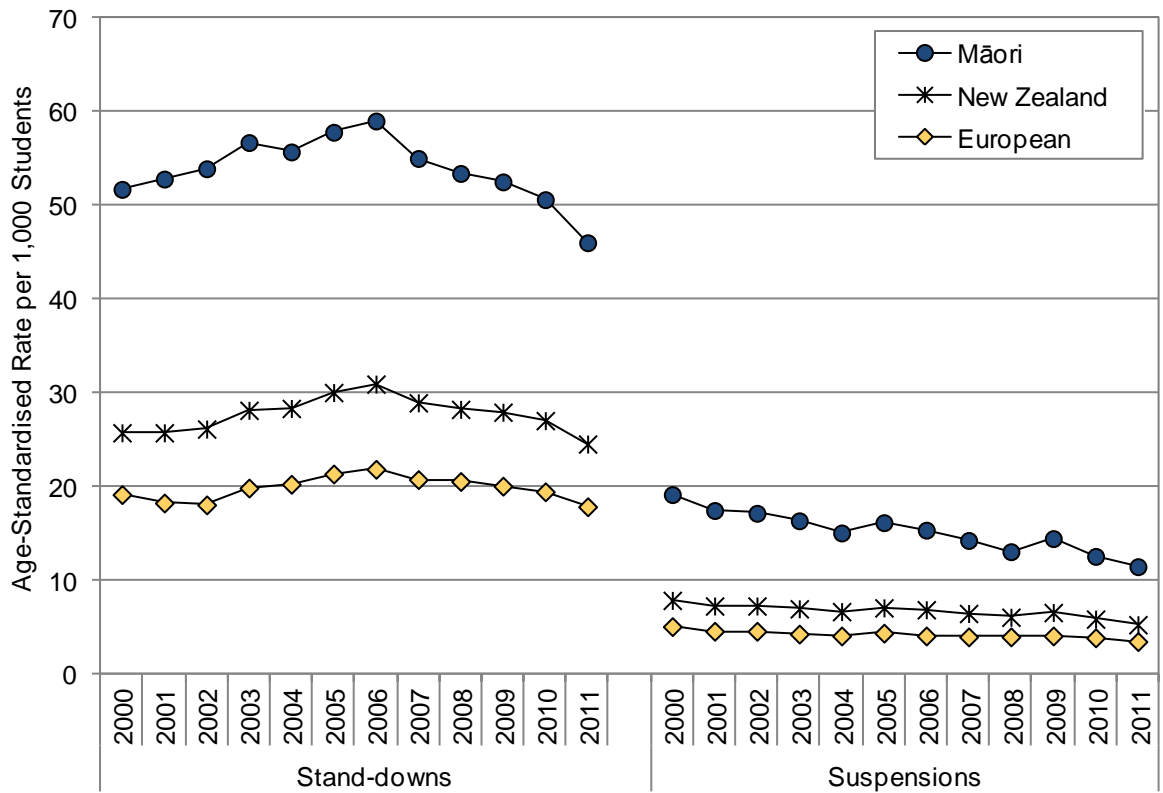
Note 3: Ethnicity is Level 1 Prioritised (i.e. one ethnic group per student)

Distribution by Ethnicity

Stand-downs and Suspensions: In New Zealand, stand-down rates for Māori students increased during the early to mid 2000s, reached a peak in 2006 and then declined, with rates during 2000–2011 remaining higher than for European students. In contrast, suspension rates for Māori students declined throughout 2000–2011, with rates falling from 19.1 per 1,000 in 2000, to 11.4 per 1,000 in 2011. Suspension rates were also higher for Māori than for European students throughout this period, (**Figure 31**).

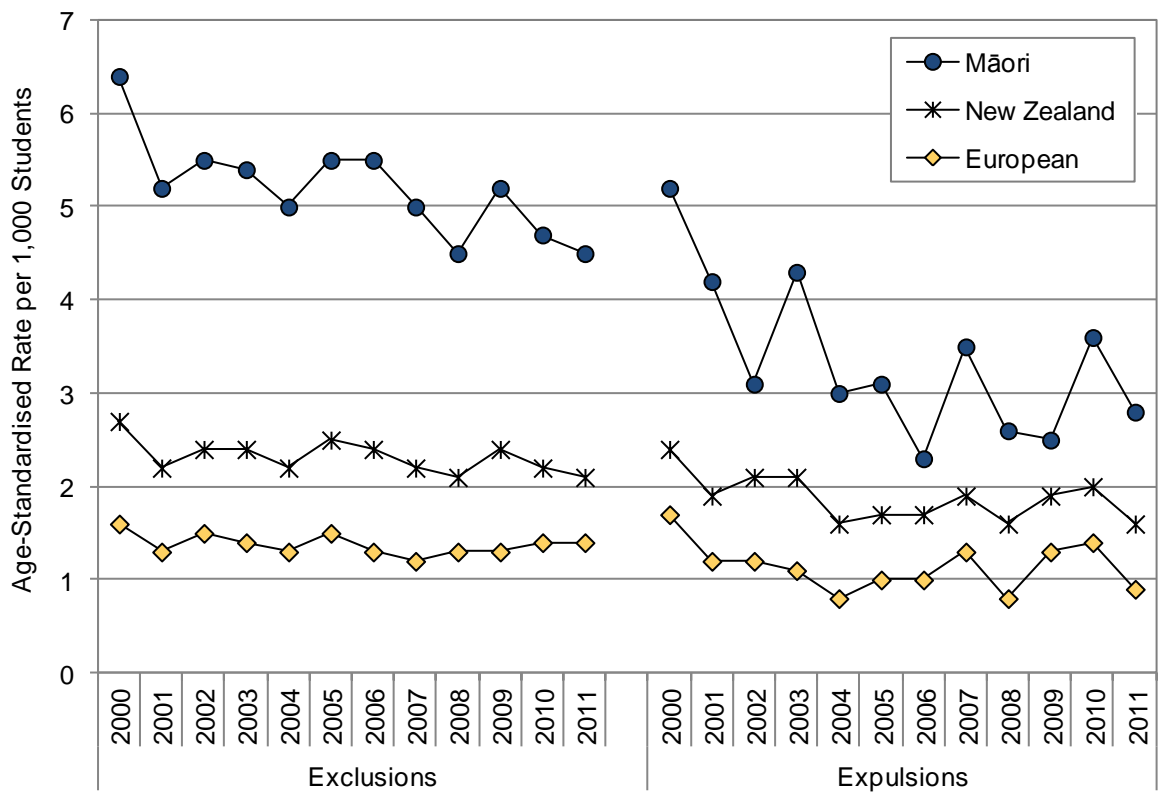
Exclusions and Expulsions: In New Zealand during 2000–2011, exclusion and expulsion rates for Māori students also exhibited a general downward trend, with exclusion rates falling from 6.4 per 1,000 in 2000, to 4.5 per 1,000 in 2011. Similarly, expulsion rates fell from 5.2 per 1,000 in 2000, to 2.8 per 1,000 in 2011. Throughout this period, exclusion and expulsion rates were higher for Māori than for European students (**Figure 32**).

Figure 31. Age-Standardised Rates of Stand-downs and Suspensions by Ethnicity, New Zealand 2000–2011



Source: Ministry of Education; Note: Ethnicity is Level 1 Prioritised

Figure 32. Age-Standardised Rates of Exclusions and Expulsions by Ethnicity, New Zealand 2000–2011



Source: Ministry of Education; Note: Ethnicity is Level 1 Prioritised

Suspensions by Ethnicity and DHB

In New Zealand during 2011, suspension rates for Māori students varied by DHB, with rates ranging from 6.8 per 1,000 in Canterbury to 24.6 per 1,000 in South Canterbury (**Table 14**).

Table 14. Age-Standardised School Suspension Rates by Ethnicity and District Health Board, New Zealand 2011

District Health Board	Māori	European	Total
Age-Standardised Suspension Rate per 1,000 Students			
Northland	12.6	4.8	8.8
Waitemata	10.7	3.3	4.1
Auckland	11.0	2.8	4.6
Counties Manukau	9.8	3.3	4.5
Waikato	14.7	4.2	7.5
Bay of Plenty	11.7	2.3	5.7
Lakes	12.3	2.7	7.5
Tairāwhiti	7.1	1.0	4.8
Taranaki	10.7	4.3	5.8
Hawke's Bay	9.4	4.7	6.5
MidCentral	12.7	4.2	6.8
Whanganui	18.4	3.3	9.1
Hutt Valley	8.8	1.7	3.8
Capital and Coast	8.2	1.8	3.0
Wairarapa	18.1	6.8	9.7
Nelson Marlborough	14.6	3.8	5.7
West Coast	11.0	3.3	4.4
Canterbury	6.8	2.6	2.9
South Canterbury	24.6	5.9	7.6
Southern	9.4	3.8	4.5
New Zealand	11.4	3.4	5.2

Source: Ministry of Education; Note: Ethnicity is Level 1 Prioritised

New Zealand Distribution

New Zealand Trends

In New Zealand during 2000–2011, 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 number of stand-downs greatly exceeded the number of suspensions, which in turn exceeded the number of exclusions and expulsions.

Suspensions by Behaviour

In New Zealand during 2011, the most common reasons for a suspension were continual disobedience (25.7%), the misuse of drugs or other substances (22.6%), or a physical assault on other students (18.9%), which together accounted for 67.2% of all suspensions. Verbal assaults on staff and theft also made a smaller contribution.

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

The Determinants of Health for Children and Young People in New Zealand [6] provides a brief overview of local policy documents and evidence-based reviews which are relevant to stand-downs, suspensions, exclusions and expulsions.

TRUANCY AND UNJUSTIFIED ABSENCES

Introduction

The Ministry of Education intermittently undertakes Surveys of School Attendances. The most recent School Attendance Survey for which data is available occurred in June 2011 [58]. The following section uses data from the Ministry of Education's School Attendance Survey to explore truancy and unjustified absences in Māori secondary school students during 2006, 2009 and 2011.

Background

In 2007, the Youth'07 survey of 9,107 secondary school students from across New Zealand, assessed students self-reported experiences with truancy. In this survey self-reported truancy was significantly higher for Māori students (27.6% 95% CI 24.8–30.4) than for European/Other students (11.7% 95% CI 10.4–13.0), with truancy also increasing with age and with the level of deprivation of the school's catchment [59]. This is of concern, as research suggests that sustained truancy significantly affects educational attainment, with student attendance being one of the most important predictors of educational achievement in senior secondary school [60]. 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 [56] [61].



Data Source and Methods

Definitions

1. *Total Unjustified Absence Rate*
2. *Frequent Truancy Rate*

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: Students were classified as frequent truants if they had three or more unjustified absences during the survey week.

Absence data was 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 and relates to an average (mean) daily absence for the week per 100 students. It should be noted that this does not tell us whether it is the same students that are absent, or whether different students are involved each day.

Data Source

Ministry of Education Student Attendance Surveys (2006, 2009 and 2011)

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

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

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

Notes on Interpretation

The 2011 Ministry of Education Attendance Survey gathered data on student attendance during the week of 13–17 June 2011. Of the 2470 schools invited to participate, completed returns were received from 2180, a response rate of 88%. The responding schools had approximately 625,000 students on their rolls, equating to

87% of the student population in all state and state integrated schools on 1 July 2011. In the 2009 Survey, to reduce compliance costs, a representative sample of 768 schools was invited to participate, with the response rate being 85%. All state and state integrated schools were invited to participate in the 2006 survey. Two forms of data collection were used. Schools that use a module in their Student Management Systems to enter their attendance records electronically were asked to provide an extract from the electronic Attendance Register (eAR). Schools that do not use eAR were invited to take part in the paper version of the survey.

The schools recording absences on the paper form were required to make their own judgement of whether a student was absent for all or part of a day, and whether that absence was justified based on the definitions and instructions supplied. For further detail see

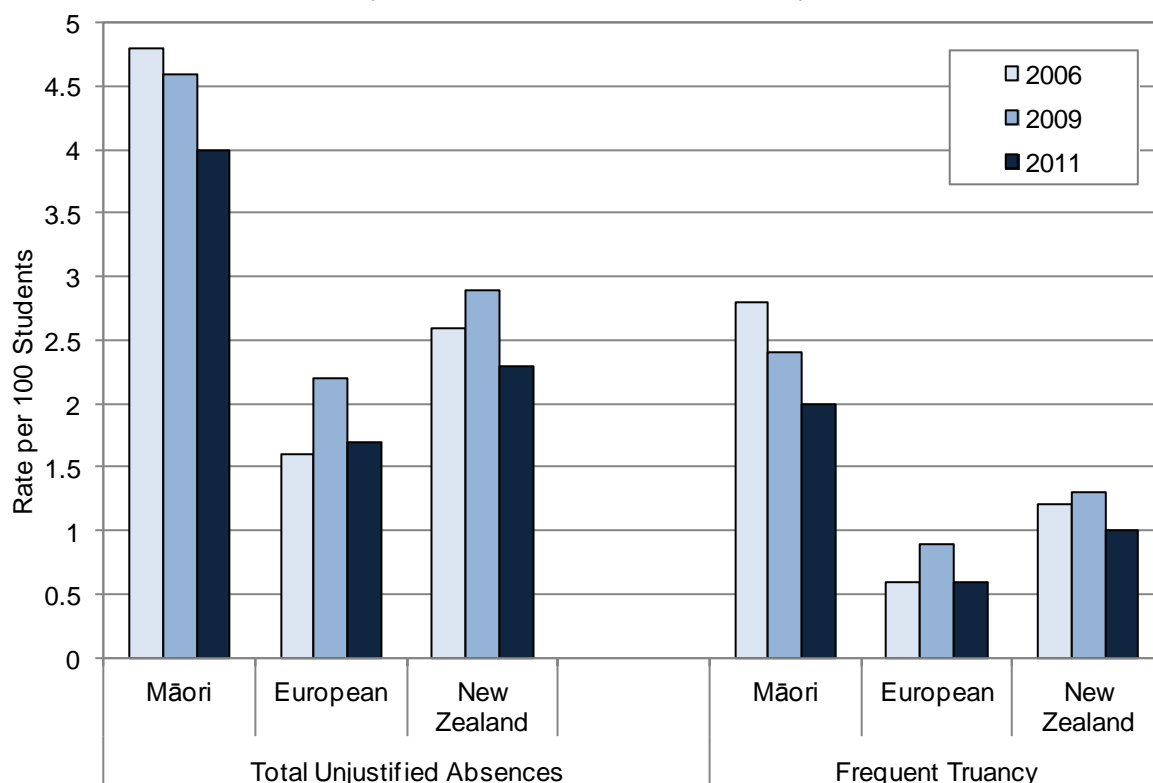
<http://www.educationcounts.govt.nz/publications/series/2503/attendance-in-new-zealand-schools-2011>

Note: All ethnic groups across each year have been standardised to 2011 year-level rates to allow for comparison between survey years and ethnic groups

Distribution by Ethnicity

In New Zealand, total unjustified absences in Māori students fell from 4.8 per week per 100 students in 2006, to 4.0 per week per 100 students in 2011, while frequent truancy fell from 2.8 per 100 students in 2006, to 2.0 per 100 students in 2011. Total unjustified absences and frequent truancy however, remained higher for Māori than for European students during these periods (**Figure 33**).

Figure 33. Total Unjustified Absences and Frequent Truancy by Ethnicity, New Zealand 2006, 2009 and 2011 Ministry of Education Attendance Surveys



Source: Ministry of Education Attendance Surveys; Note: Total Unjustified Absence Rate is the mean number of daily absences per week per 100 students; Frequent Truant Rate is the number of students with 3+ unjustified absences per week per 100 students

Distribution by Ethnicity and DHB

In New Zealand during 2011, total unjustified absences in Māori students varied by DHB, with rates ranging from 2.6 per week per 100 students in Nelson Marlborough and the Southern DHB, to 5.5 per week per 100 students in Northland. Similarly frequent truancy ranged from 0.6 per 100 students in South Canterbury, to 4.8 per 100 students in Tairāwhiti (**Table 15**).

Table 15. Total Unjustified Absences and Frequent Truancy by Ethnicity and District Health Board, New Zealand 2011 Ministry of Education Attendance Survey

District Health Board	Māori	European	Total	Māori	European	Total
	Total Unjustified Absences			Frequent Truancy		
Northland	5.5	2.4	3.8	3.2	1.2	2.1
Waitemata	3.0	1.3	1.6	1.4	0.6	0.7
Auckland	3.6	0.9	1.8	1.7	0.4	0.7
Counties Manukau	5.2	1.5	2.9	2.8	0.7	1.4
Waikato	4.2	2.4	2.9	2.0	0.8	1.2
Bay of Plenty	4.6	2.5	3.2	2.0	0.6	1.1
Lakes	4.5	2.1	3.3	2.2	0.5	1.4
Tairāwhiti	5.2	2.6	4.2	4.8	2.6	3.9
Taranaki	3.8	2.0	2.4	1.7	1.0	1.1
Hawke's Bay	3.2	1.6	2.2	1.4	0.5	0.8
MidCentral	3.1	1.2	1.7	1.1	0.5	0.7
Whanganui	3.7	1.5	2.3	1.8	0.7	1.2
Hutt Valley	3.5	1.2	1.8	1.0	0.5	0.7
Capital and Coast	3.3	1.8	2.3	1.3	0.5	0.7
Wairarapa	3.9	2.4	2.8	1.2	0.7	0.9
Nelson Marlborough	2.6	1.3	1.5	1.2	0.5	0.6
West Coast	4.0	2.0	2.4	2.4	0.7	1.0
Canterbury	3.4	1.8	2.0	1.2	0.6	0.7
South Canterbury	3.4	1.8	2.0	0.6	0.8	0.7
Southern	2.6	1.4	1.6	1.2	0.7	0.8
New Zealand	4.0	1.7	2.3	2.0	0.6	1.0

Source: Ministry of Education Attendance Surveys; Note: Total Unjustified Absence Rate is the mean number of daily absences per week per 100 students; Frequent Truant Rate is the number of students with 3+ unjustified absences per week per 100 students

New Zealand Distribution

Distribution by Year of Schooling

In New Zealand during 2011, 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.

Distribution by School Socioeconomic Decile

In New Zealand during 2011, 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 (deciles 9–10) areas.

Publications Which Consider Interventions to Improve School Attendance

The Determinants of Health for Children and Young People in New Zealand [6] provides a brief overview of overseas publications relevant to the improvement of school attendance.



RISK AND PROTECTIVE FACTORS

A GOOD START IN LIFE: MAXIMISING SYSTEMS AND CLINICAL PRACTICE AROUND OUR WHĀNAU

Independent Viewpoint by Dr Bev Lawton

The ultimate goal is for women and their babies to live in good health and to their utmost potential. This is clearly not happening for Māori women and their babies. Pregnant Māori women and their children are more likely to suffer harm and death than non-Māori women [62]. Māori mums are three times as likely to die whilst pregnant or within 42 days of pregnancy than European women [62].

This report Te Ohonga Ake or the “Awakening” represents an important opportunity, by giving us excellent data to direct our enquiries and actions to improve the health of our Māori whānau.

Finding the Facts: Finding the Solutions

When presented with some of the data about young Māori mothers (< 20 years of age) and their babies a kaumātua (elder) asked, “What are our women doing that their babies die?” Maternal and infant inequalities have produced deficit language and blaming, especially for our young mothers. It is imperative that we move from blaming to a structural analysis and examine what is happening for our whānau. We need to unravel what is around whānau that is supporting and hindering their access to health care and health equity. We need to put whānau at the centre of our analysis. By taking the stance that women and their whānau are not to blame we can turn our gaze onto the systems and clinical performance around these whānau and move to solutions that involve structural responsiveness.

Areas that can be addressed by improving, clinical performance and systems include timeliness of maternity care, timely vaccination and substandard maternity care.

Māori women engage in maternity care early

It's a popular belief that young Māori women (<20 years) engage with maternity services late in their pregnancies. This report notes that Māori are less likely to be booked with a Lead Maternity Carer (LMC) at delivery. The recent findings of our 'E Hine study' do not support teenager's lack of engagement in maternity care. E Hine looks at the barriers and facilitators to accessing appropriate maternal and infant care that are faced by young Māori (< 20 years of age). We interviewed 44 women (<20 years) in various stages of pregnancy and followed them and their whānau until the baby was one year of age.

Almost all of our participants engaged with health services early in their pregnancy. The next step, moving from this initial maternal health contact to either hospital care or a lead maternity carer was difficult for many. One of our teenage participants:

‘they [the doctor] gave this paper with a list on it and I tried to get in contact with some of them but they said they weren’t working around Christmas...and I went up to Wainui and tried to find one up there but no-one got back to me and I haven’t had a midwife since’.
(CA05)

Initial health service contacts involved general practitioners, nurses and youth services. The successes occurred when the first port of call in the health service actively pursued the connection to the next step. Barriers occurred from that first health service contact to engagement with either a hospital service or an LMC. This is an example of the system causing the barriers to engagement. Our maternity service section 88 payment system covers the first trimester of pregnancy and claiming is available to all health professionals. In reality fragmentation occurs. Booking with the LMC has become the measure of engagement with maternity care when in fact pregnant women are engaging in maternity care from the moment they see that first health professional.



Hence there is opportunity here. Women believe they have started their maternity health care journey the minute they touch base with a health service and primary care services should be providing that early care and then navigating the women to an LMC or hospital service. At present the data collection reflects that maternity care begins with first contact with an LMC or hospital maternity service when in reality it starts with the first health contact and that is the data point that needs to be captured in the future.

Our primary care services are already funded for first trimester care and therefore can be engaged with maternity care: screening (sexually transmitted diseases, foetal abnormalities, mental health, and violence), preventative treatments, education and recognition of high risk. Most of all we need a seamless service with the primary health contact navigating women along the pathway. The fragmentation of care may be related to the present maternity service funding model.

Goal

Seamless maternity care commencing in the first trimester

Proposed Actions

- Utilise “Pregnancy care starts at the first interaction with a health service” as the theme. By adopting this model it becomes logical that the first health contact becomes the initial navigator for the system and appropriate funding and protocols can be developed for the pathway.
- Other navigation pathways should be established- for example pharmacy, education, well child services, family planning, housing, income support services etc
- Change the name- LMC- to reflect the role as part of a continuum of care. For example use self-employed midwife, private obstetrician.

Improving Clinical Care

This is a major area where we can achieve health gains for Māori. Barriers to care for Māori including differential service access and care have been described in the Aotearoa/New Zealand environment involving cardiovascular disease, diabetes, and asthma [63,64,65]. These are likely to be occurring within maternity services as well.

We recently reviewed 80 cases of severe acute maternal morbidity using multidisciplinary teams to look at whether the severe harm was potentially preventable. Severe acute maternal morbidity (SAMM) is defined as “a very ill pregnant or recently delivered woman who would have died had it not been that luck or good care was on her side” [66]. Assessment of SAMM cases is increasingly used to complement maternal mortality review in developed countries and analysis of morbidity has become a main topic in quality of care issues in maternity care [67,68]. Our review found that over half of the cases were either potentially preventable or improvement in care was needed. Clinician errors involving delay, or failure in diagnosis, or recognition of high risk and delay, or failure in treatment were the commonest preventable factors. Post-partum haemorrhage and septicaemia were identified as areas for improvement that could be addressed by educational programs and guidelines. These severe health events impact on the whānau with increased infant loss and harm to infant and mother. Hence a SAMM event is more likely to impact on households with fewer resources such as Māori whānau and be reflected in our negative health statistics.

Timely vaccination

Previously New Zealand had only moderate uptake of essential childhood vaccinations with significant disparities for Māori children. Gains have been made. In 1991 only 42% of Māori were fully immunised by two years of age and this increased to 69% in 2005 and then to 92.2 % in 2012. These significant gains since 2005 have been supported by prioritisation of immunisation at a national and district level with clear policy, use of

effective tools and in particularly the National Immunisation Register, reporting tools, media coverage of rates and feedback loops [69].

But the stark reality of Te Ohonga Ake is that less than 60% of Māori are vaccinated in a timely fashion by 6 months compared to 80% of non-Māori non Pacific infants (see Immunisation Section commencing **Page 107**). High completion of vaccination by 2 years is not adequate. Delays in vaccination lead to cases of vaccine preventable disease. For example Māori infants are more than twice as likely to be admitted to hospital with Pertussis than non-Māori non-Pacific infants [1].

These health discrepancies are not about being Māori but about systems that don't perform for those who are poorer or disadvantaged due to multiple factors including health literacy, racial discrimination, economic deprivation, poor housing, availability of transport or services and possibly differential levels of service.

Proposed Actions

- Strengthening primary health care teams, improving knowledge and confidence both in health teams and the community and effective practice management systems are some of the necessary system components necessary to achieve high immunisation rates [69].
- Early enrolment (preferably at birth or even better, antenatally) with a primary service provider promotes timely vaccination [70].
- The importance of connecting the dots, connecting the services for Māori from maternal to infant health is again emphasised.

Conclusion

The data in Te Ahonga Ake represent an opportunity, an opportunity that we all must act on to deliver Healthy Mums, Healthy babies and Health communities.

Moving Forward

- Choose areas of focus from this report
- Try to understand the disparities using a system and provider/clinician model
 - Create solutions.
 - Action





WELL CHILD SERVICES

IMMUNISATION COVERAGE

Introduction

The following section provides a brief overview of New Zealand's current immunisation schedule, along with a summary of recent changes, before reviewing immunisation coverage rates in Māori children at five key milestone ages: 6, 12, 18 and 24 months and 5 years, using data from the National Immunisation Register.

Background

Immunisation is the process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine. It provides both individual protection and population-wide protection by reducing the incidence of infectious diseases and preventing their spread to vulnerable people (also known as herd immunity) [71].

The 20th Century saw dramatic declines in vaccine-preventable diseases worldwide and vaccination has been identified as a cost-efficient means of reducing inequalities in health [72,73]. In New Zealand, vaccination rates have improved in recent years [74], with 92% of two year olds fully immunised by their second birthday in the 12 months to June 2012, as compared to 67% in 2007 [74,75]. Reductions in inequalities in immunisation coverage at 24 months have also occurred, with 92.2% of Māori children being fully immunised at 24 months in 2012 (quarter 2), as compared to 93.3% of European children. However, ethnic differences remain at other ages, with the proportion of Māori babies fully immunised at 6 months being only 57.6%, as compared to 77.9% for European babies during the same period [74,75]. Thus, vaccine preventable diseases persist and vaccination coverage remains below the thresholds required to provide the population-wide benefits of herd immunity for some diseases, including measles and pertussis [71,76,77].

The Ministry of Health thus remains committed to improving immunisation coverage rates and the timeliness of immunisation [75], with increased immunisation being one of six 2012/2013 Health Targets [78]. If this target is achieved, by July 2014, 90% of eight months olds should have had their primary course of immunisation (at six weeks, three months and five months) on time, increasing to 95% by December 2014.

New Zealand's Current Immunisation Schedule

The New Zealand Immunisation Schedule offers publicly funded vaccination aimed at ten vaccine preventable diseases: diphtheria, tetanus, pertussis, poliomyelitis, hepatitis B, *Haemophilus influenzae* type b, measles, mumps, rubella and pneumococcal disease, to children aged between six weeks and 11 years (**Table 16**) [79]. In addition, human papillomavirus (HPV) vaccination is offered to girls aged 12 years. Publicly funded vaccinations for influenza, Meningococcal A, C Y and W135 and tuberculosis (BCG vaccination) are offered to those at risk. While the majority of these vaccinations have been part of the Immunisation Schedule for some time, vaccinations for pneumococcal disease and human papillomavirus in girls are recent additions.



Table 16. 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)
	10-valent pneumococcal conjugate	1 injection (SYNFLORIX®)
3 months	diphtheria/tetanus/acellular pertussis/inactivated polio vaccine/hepatitis B/ <i>Haemophilus influenzae</i> type b	1 injection (INFANRIX® -hexa)
	10-valent pneumococcal conjugate	1 injection (SYNFLORIX®)
5 months	diphtheria/tetanus/acellular pertussis/inactivated polio vaccine/hepatitis B/ <i>Haemophilus influenzae</i> type b	1 injection (INFANRIX® -hexa)
	10-valent pneumococcal conjugate	1 injection (SYNFLORIX®)
15 months	<i>Haemophilus influenzae</i> type b	1 injection (Act-HIB)
	measles/mumps/rubella	1 injection (M-M-R® II)
	10-valent pneumococcal conjugate	1 injection (SYNFLORIX®)
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 doses given over 6 months (GARDASIL®)

Source: Ministry of Health, New Zealand Immunisation Schedule [79]

Immunisation Coverage Rates

The following section uses the National Immunisation Register to review immunisation coverage rates for Māori children at 6, 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

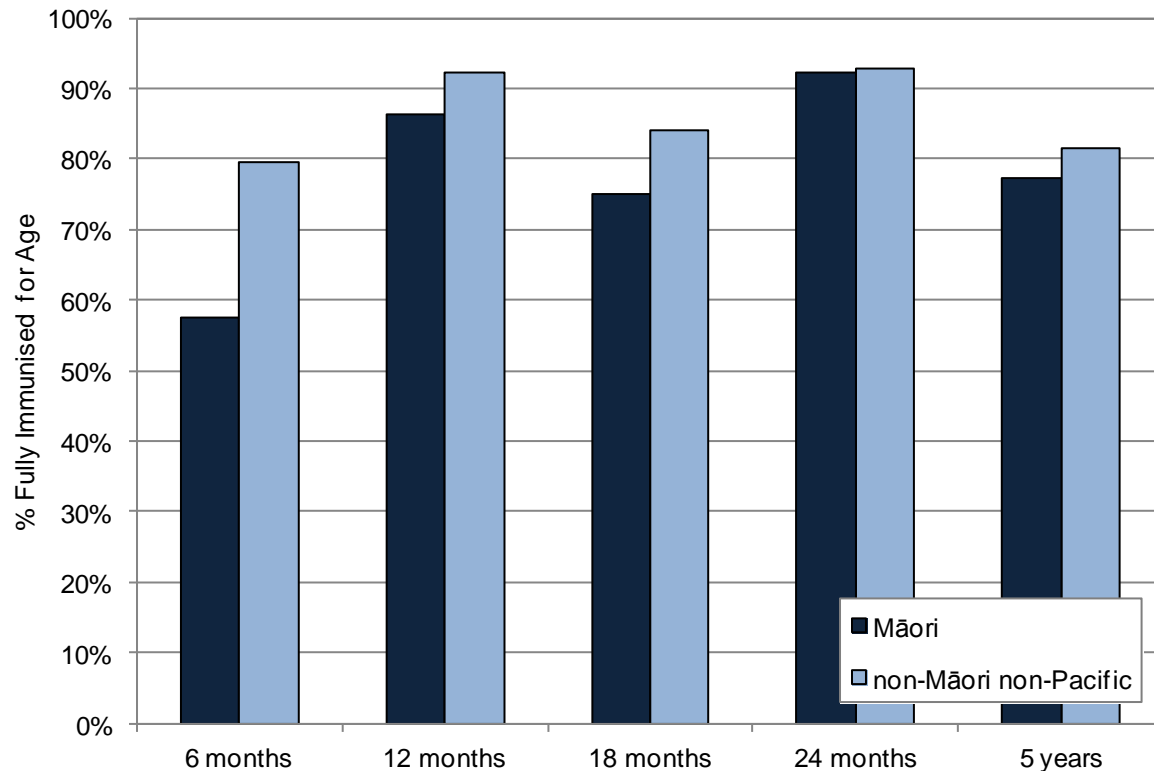
During pregnancy and after birth, parents are informed about the NIR, with Lead Maternity Carers playing a key role in information provision. Following delivery, all of the relevant information about each child is added to the NIR, with parents being able to 'opt off' having their child's immunisation 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 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>.

Distribution by Ethnicity

Immunisation coverage rates at each milestone age (6, 12, 18, 24 months and 5 years) increased for both Māori and non-Māori non-Pacific children during 2009 (Q2) to 2012 (Q2). While coverage rates at each milestone age remained higher for non-Māori non-Pacific children than for Māori children throughout this period, the magnitude of these differences decreased at 24 months, and to a lesser extent at 12 and 18 months (**Figure 35**). Thus by 2012 (Q2) immunisation coverage at 24 months was 92.2% for Māori children as compared to 92.7% for non-Māori non-Pacific children (**Figure 34**).

Figure 34. Immunisation Coverage by Milestone Age and Ethnicity, New Zealand 2012 (Quarter 2)



Source: National Immunisation Register

Distribution by Ethnicity and DHB

In New Zealand during 2012 (Q2), immunisation coverage rates in Māori children at 24 months of age varied with DHB, with rates ranging from 83.4% in Northland to 96.7% in the Hawke's Bay (**Table 17**).

New Zealand Distribution

Distribution by Milestone Age

In New Zealand during 2009 (Q2) to 2012 (Q2), immunisation coverage rates were highest for children aged 12 and 24 months, followed by 18 months, and then five years, with coverage being lowest for children aged 6 months. Immunisation coverage rates however, increased for all age groups during this period.

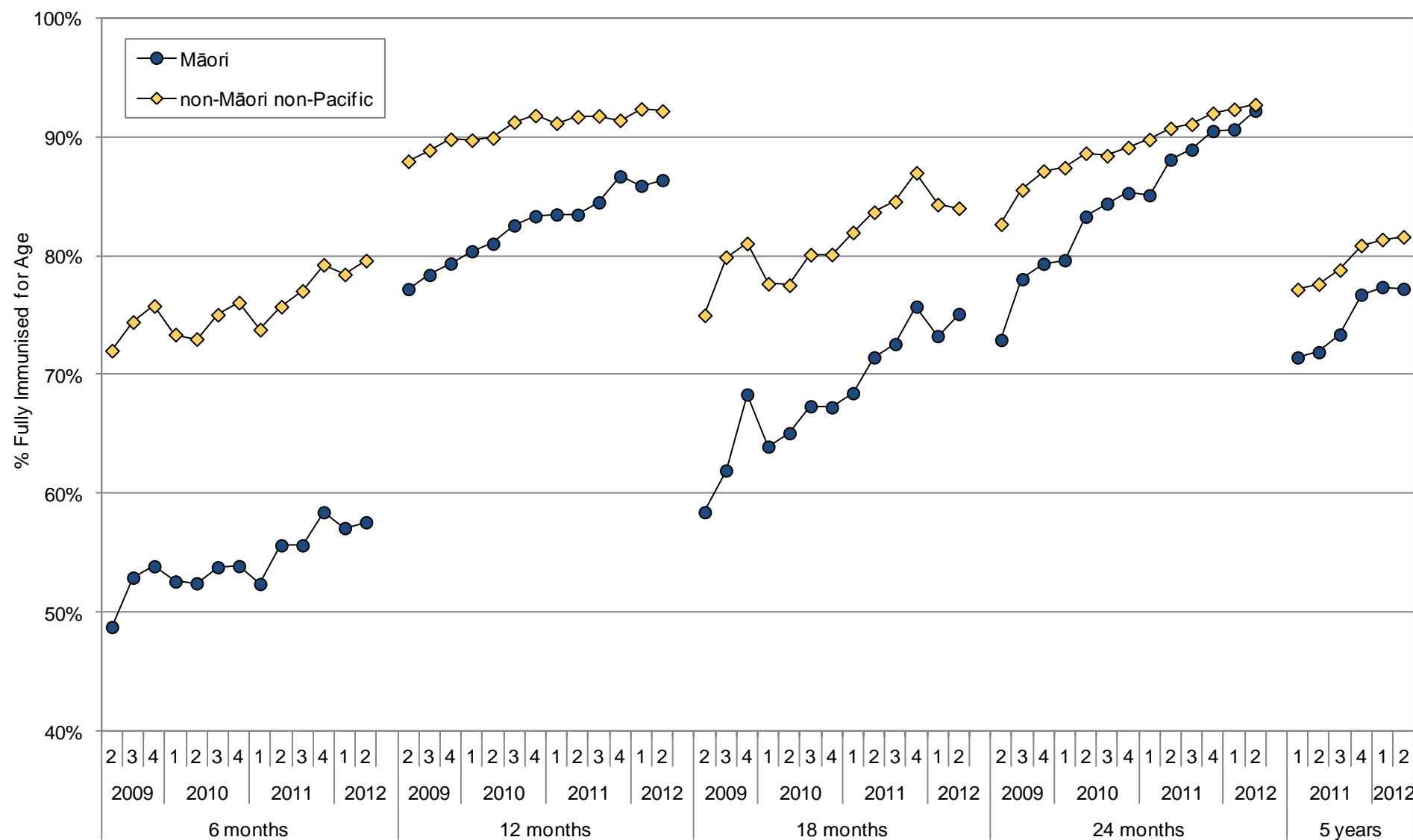
Distribution by NZ Deprivation Index Decile

In New Zealand during 2009 (Q2) to 2012 (Q2), immunisation coverage rates at 6, 12 and 18 months and five years remained higher for children from the least deprived (NZDep deciles 1–2) > average (NZDep deciles 5–6) > most deprived (NZDep deciles 9–10) areas. While similar socioeconomic gradients were evident at 24 months during early 2009, these lessened, so that by the first two quarters of 2012, coverage rates were very similar for those from the most and least deprived areas. Thus by 2012 (Q2) immunisation coverage at 24 months was 93.8% for children from the least deprived (NZDep deciles 1–2) areas, 92.1% for children from average (deciles 5–6) areas, and 94.1% for children from the most deprived (deciles 9–10) areas.

Local Policy Documents and Evidence-Based Reviews Relevant to Immunisation

The Determinants of Health for Children and Young People in New Zealand [6] provides a brief overview of local policy documents and evidence-based reviews which consider immunisation and interventions aimed at increasing immunisation coverage.

Figure 35. Immunisation Coverage by Milestone Age and Ethnicity, New Zealand 2009 (Quarter 2) – 2012 (Quarter 2)



Source: National Immunisation Register

Table 17. Immunisation Coverage at 24 Months by Ethnicity and District Health Board, New Zealand 2012 (Quarter 2)

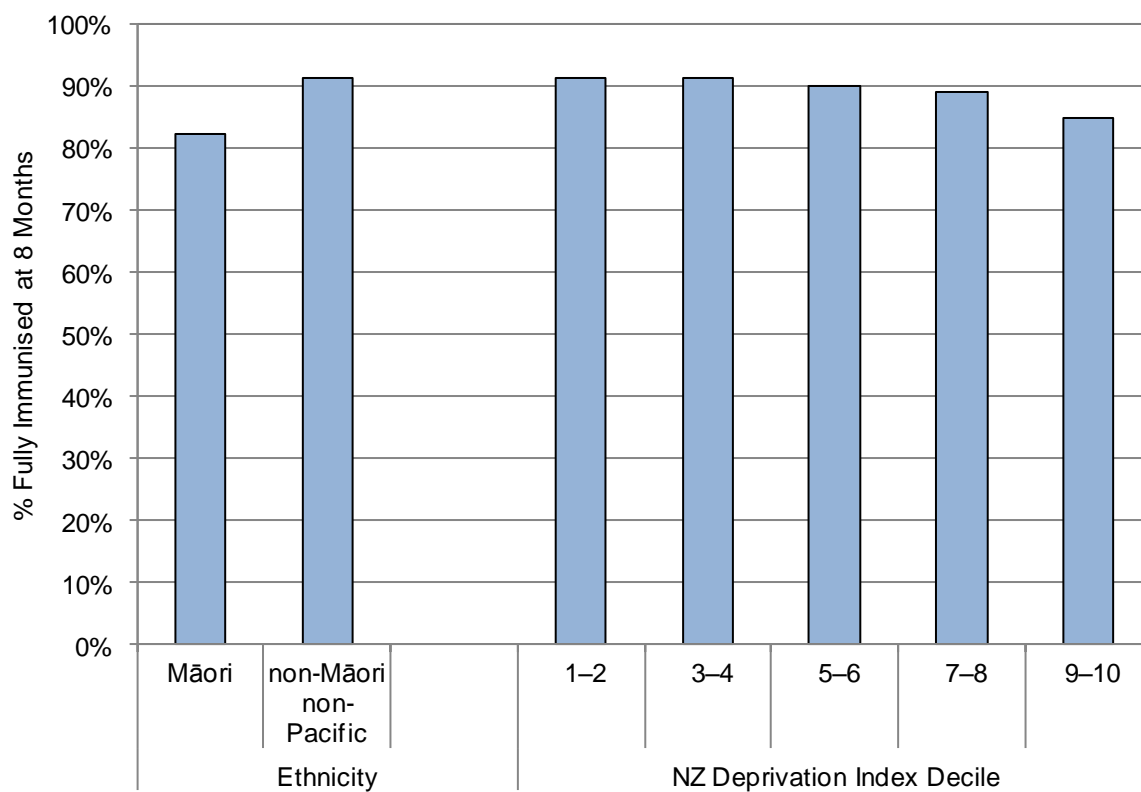
District Health Board	Māori	non-Māori non-Pacific	Total
Immunisation Coverage at 24 months (%)			
Northland	83.4	85.6	84.4
Waitemata	94.5	94.1	94.7
Auckland	91.5	95.3	95.4
Counties Manukau	92.0	95.9	95.0
Waikato	91.8	91.3	91.6
Bay of Plenty	90.3	90.5	90.5
Lakes	94.1	93.7	94.1
Tairāwhiti	94.8	97.8	94.9
Taranaki	91.1	90.6	91.2
Hawke's Bay	96.7	94.4	95.5
MidCentral	95.7	94.4	95.1
Whanganui	91.5	91.2	91.0
Hutt Valley	95.1	93.1	93.5
Capital and Coast	95.5	92.6	93.6
Wairarapa	89.7	95.7	93.6
Nelson Marlborough	90.5	86.4	87.4
South Canterbury	92.0	97.1	96.4
Canterbury	94.5	90.5	91.0
West Coast	86.4	64.6	78.4
Southern	92.2	95.5	95.1
New Zealand	92.2	92.7	93.1

Source: National Immunisation Register

Immunisation Coverage at 8 Months

In 2012 the Ministry of Health introduced a new immunisation target which focused on immunisation coverage at 8 months of age. During the year ended June 2013, 82.4% of Māori children were fully immunised at 8 months of age, as compared to 91.3% of non-Māori non-Pacific children. In addition, 91.3% of children living in the least deprived (NZDep deciles 1–2) areas were fully immunised at 8 months of age, as compared to 84.9% of children living in the most deprived (NZDep deciles 9–10) areas (**Figure 36**).

Figure 36. Immunisation Coverage at 8 Months by Ethnicity and NZ Deprivation Index Decile, New Zealand Year Ending June 2013



Source: National Immunisation Register

WELL CHILD/TAMARIKI ORA SERVICES

Introduction

The following section reviews the proportion of Māori Plunket clients receiving each of their Core 1–7 Well Child/Tamariki Ora contacts during the past five years.

Background

The Well Child/Tamariki Ora (WC/TO) Framework was introduced in 2002 with the aim of reducing fragmentation and inconsistencies in the delivery of the WC/TO programme [80]. The programme provides a universal health assessment, and a health promotion and support service for children and their families from birth to five years. WC/TO services are provided by a range of providers including Plunket, Māori and Pacific health providers and primary health organisations [81]. A review of the 2002 framework, commencing in 2006, led to the phasing in of a new framework from July 2010.

The current WC/TO Framework consists of a series of initial contacts carried out by the lead maternity carer (LMC), a six-week check carried out by the baby's general practice, and eight core contacts, from four to six weeks to five years (see Methods box below) carried out by a WC/TO provider [82,83]. Contacts consist of health and development/clinical assessments, interventions and support, and promotion of health and development/health education. Health and development/clinical assessments include a review of maternal, family and child health and wellbeing, child growth and development, vision and hearing, developmental assessments (Parental Evaluation of Developmental Status PEDS), oral health (Lift the Lip), and a behavioural assessment at the B4 School Check. Interventions and support includes clinical evaluations, immunisations, ABC smoking cessation, family violence screening, response to assessments and additional contacts as required. Promotion of health and development/health education includes breastfeeding and nutrition, sudden unexpected death in infancy (SUDI) prevention, parenting support, injury prevention and childhood illness and child development education.

The recent review of the WC/TO Framework sought to determine which types of activities can help improve child health outcomes and reduce inequalities among children aged 0 to 5 years, based on evidence and best practice [81]. There is good evidence to support a range of health promotions activities in early childhood, including prevention of infectious diseases by vaccination and other means, reducing the risk of SUDI, supporting breastfeeding, encouraging better dental care, and informing and advising parents about the risk of accidents [84]. The evidence base for universal screening programmes is more limited [84,85]. However, several evidence-based screening tests, such as newborn hearing screening, are included in the Framework, and the recent review has led to the phasing out of those screening tests that do not appear to be effective, such as routine tympanometry for glue ear at three years [81].

Plunket Children Receiving Core Well Child Contacts

In New Zealand, Well Child/Tamariki Ora services are provided by a range of providers including Plunket, Māori and Pacific health providers and public health services. Of these, Plunket is the largest provider of Well Child Services. It sees over 91% of New Zealand's newborn babies during their first six weeks of life, with contacts including home visits, clinic based contacts, and visits at other locations such as marae, family centres, Kōhanga Reo and mobile buses [86]. In addition to its wide coverage, Plunket has a central database which allows for an assessment of the proportion of active clients receiving their core WC/TO contacts.

Note: The following section reviews the proportion of Māori children receiving their Core Well Child contacts via Plunket during the past five years. It does not however, include any information on Māori children receiving their core contacts through other providers and thus the information presented may not be representative of all Māori children.



Data Sources and Methods

Indicator

Proportion of active Plunket clients who received their core Well Child/Tamariki Ora contacts

Numerator: Plunket Database: Number of active Plunket clients who received their core Well Child/Tamariki Ora contacts by scheduled core contact.

Denominator: Plunket Database: Total active clients in the Plunket database

Notes on Interpretation

Note 1: This data is based on clients who were active in the Plunket Database on 12 October 2012, when the data was extracted. Any clients discontinued by that date are not included in these figures. Contacts that took place up to and including the 21st September 2012 are included. This date is earlier than the date of data extraction as there is a three week lag from a contact taking place to it being entered in the Plunket database.

Note 2: In this analysis, data is presented for five birth cohorts; those born in the years ending June 2008, 2009, 2010, 2011 and 2012. Because the Core 7 contact is not scheduled until 2–3 years of age, not all birth cohorts had reached the age of eligibility for Core 7 by the time the data were extracted. Thus this section focuses on two age cohorts, with the oldest cohort (born in the year ending June 2008), providing the most up-to-date snapshot of Plunket children receiving their Core 1–7 visits. Given that the data for this earlier cohort is now somewhat dated, a second cohort, those born in the year ending June 2011, has been selected to provide the most up-to-date data on the proportion of Plunket children receiving their Core 1–5 contacts.

Note 3: The age bands used by Plunket for the Core Well Child Visits are outlined below:

Core Visit	Well Child/Tamariki Ora Age	Plunket Age Band
Core 1	4–6 weeks	2 weeks – 5 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
Core 5	9–12 months	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
Core 7	2–3 years	20 months 4 weeks 1 day – 47 months 4 weeks

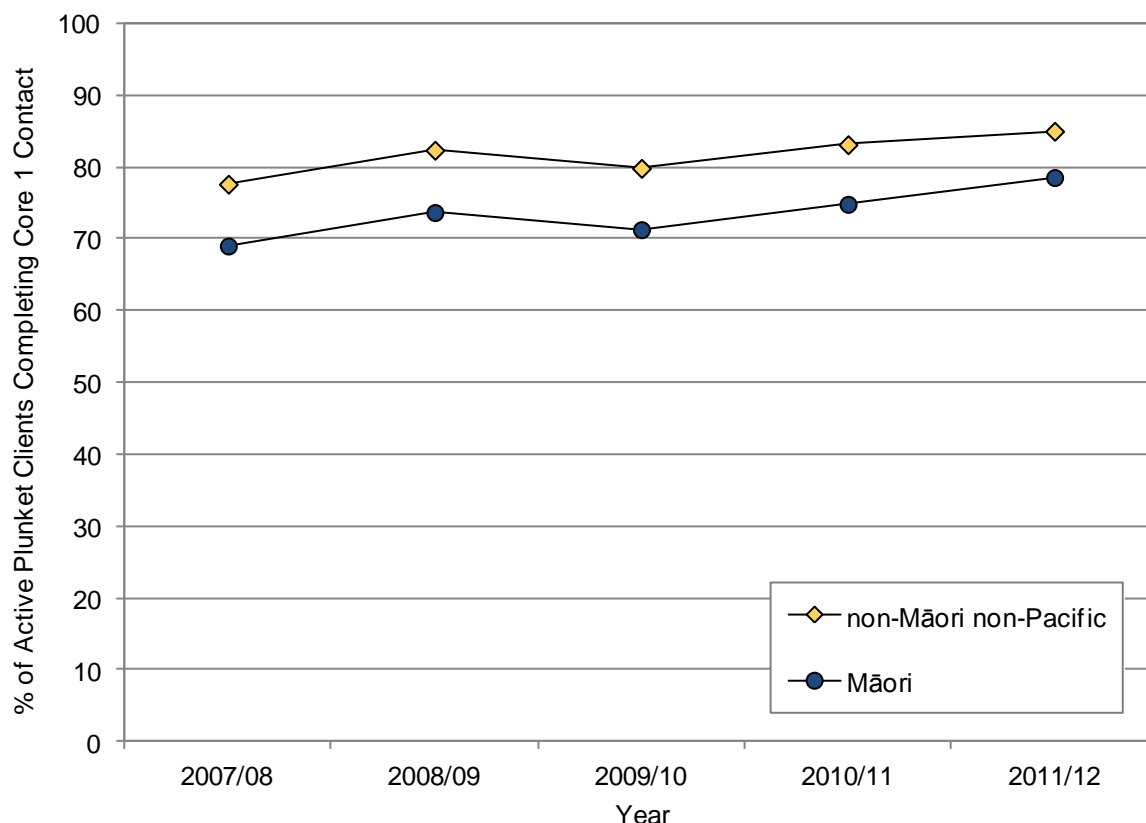
Note 4: Plunket data for the Core 8, B4 School Check is not presented in this section due to variations in the contractual arrangements for the provision of this core contact by DHB.

Note 5: Ethnicity is Prioritised in the following order: Māori, then Pacific, then non-Māori non-Pacific

Trends in Core 1 Contact by Ethnicity

In New Zealand during July 2007–June 2012, the proportion of Māori Plunket babies (aged 2 weeks to 5 weeks 6 days) receiving their Core 1 contact increased from 69.0% to 78.6%, while rates for non-Māori non-Pacific babies increased from 77.6% to 85.0%. During each time period, a lower proportion of Māori than non-Māori non-Pacific babies received their Core 1 contact (**Figure 37**).

Figure 37. Proportion of New Zealand Babies who Received their Core 1 Well Child Contact by Ethnicity, Active Plunket Clients Born July 2007 to June 2012



Source: Plunket

Proportion Receiving Core Contacts by Ethnicity

In the cohort of Plunket children born during July 2007–June 2008, a lower proportion of Māori than non-Māori non-Pacific children received their Core 1–7 contacts. Amongst Māori children, the Core 1 and 7 contacts were the least likely to be received, while the Core 2–5 contacts were the most likely to be received (**Figure 38**).

Similarly, in the cohort of Plunket children born during July 2010–June 2011, a lower proportion of Māori than non-Māori non-Pacific children received their Core 1–5 contacts. When compared to the 2007/2008 birth cohort however, the proportion of Māori children receiving their Core 1 contact was higher (**Figure 39**).

Proportion Receiving Core Contacts by Ethnicity and NZDep Decile

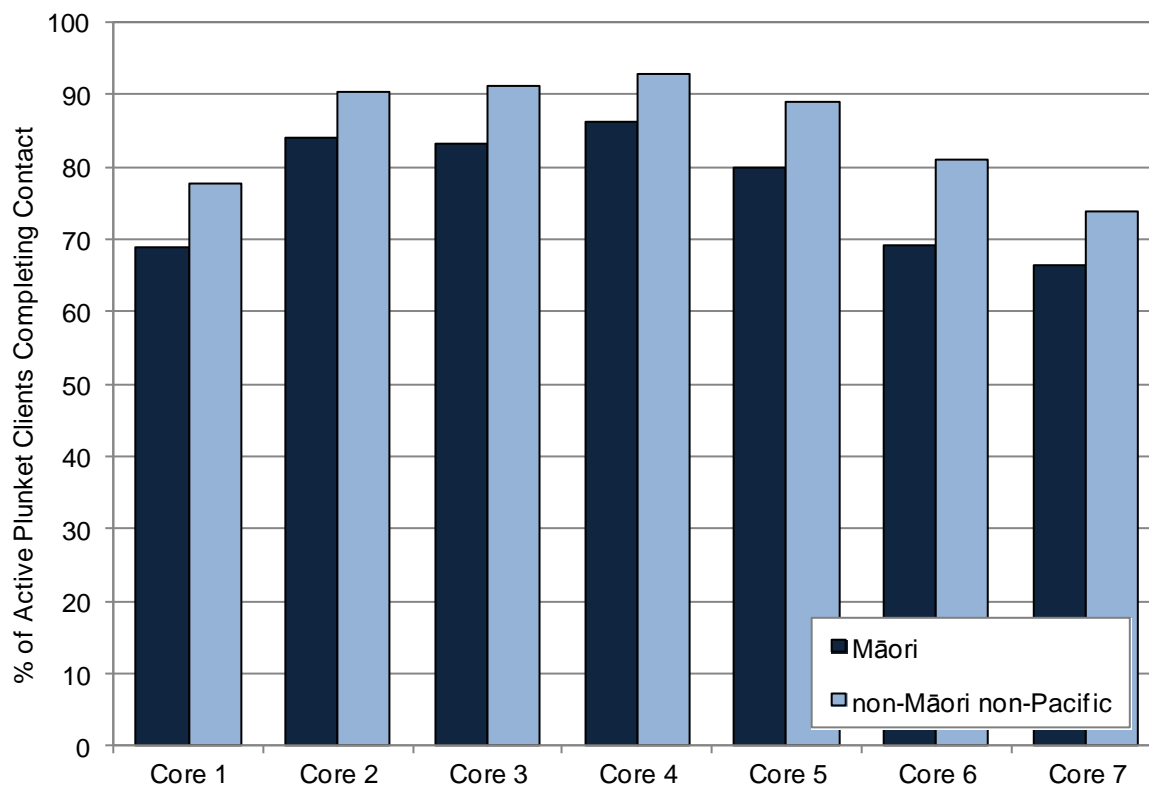
In the cohort of Plunket children born during July 2007–June 2008, a higher proportion of Māori children from the least deprived (NZDep decile 1) areas received their Core 1–6 contacts than did Māori children from the most deprived (NZDep decile 10) areas. Differences by NZDep decile were less evident for the Core 7 contact (**Figure 40**).

Similarly, in the cohort of Plunket children born during July 2010–June 2011, a higher proportion of Māori children from the least deprived (NZDep decile 1) areas received their Core 1–5 contacts than did Māori children from the most deprived (NZDep decile 10) areas (**Figure 41**).

Distribution by Ethnicity and DHB

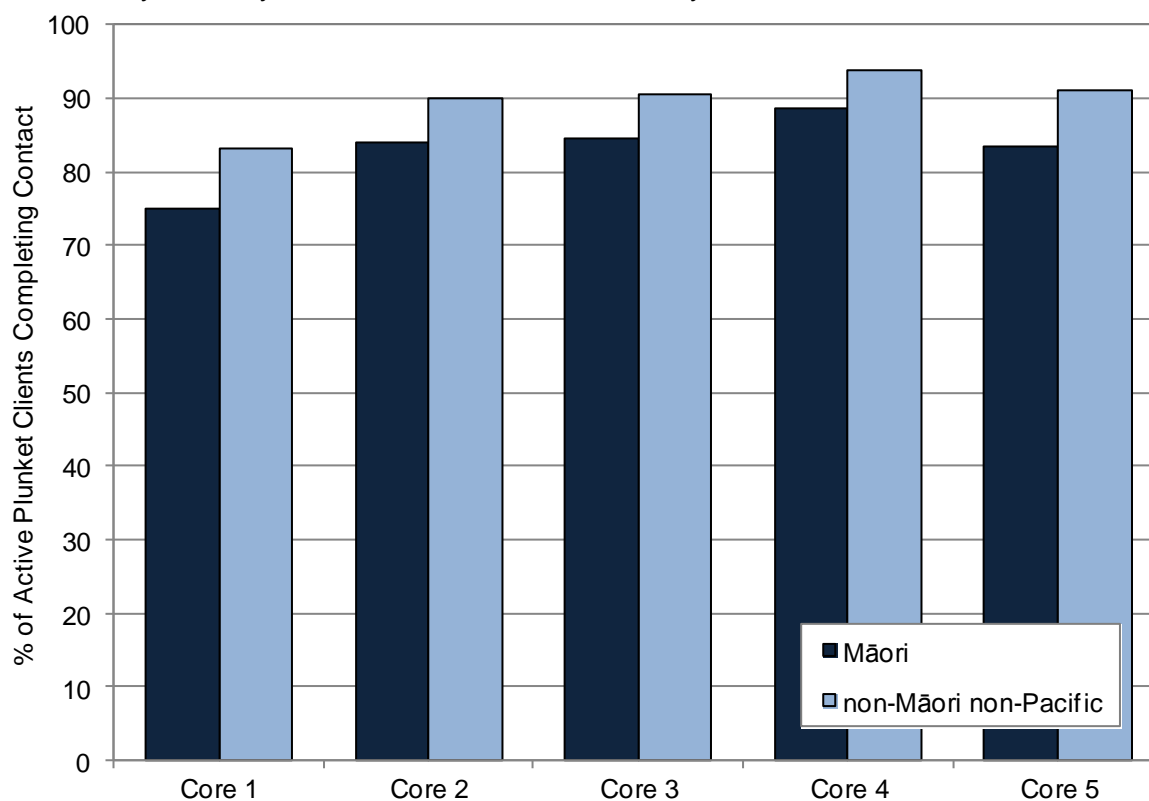
In the cohort of Plunket children born during July 2010–June 2011, the proportion of Māori children receiving their Core 1–5 contacts varied both by DHB, and by Core Contact within the same DHB (**Table 18**).

Figure 38. Proportion of New Zealand Children who Received their Core 1–7 Well Child Contacts by Ethnicity, Active Plunket Clients Born July 2007 to June 2008



Source: Plunket

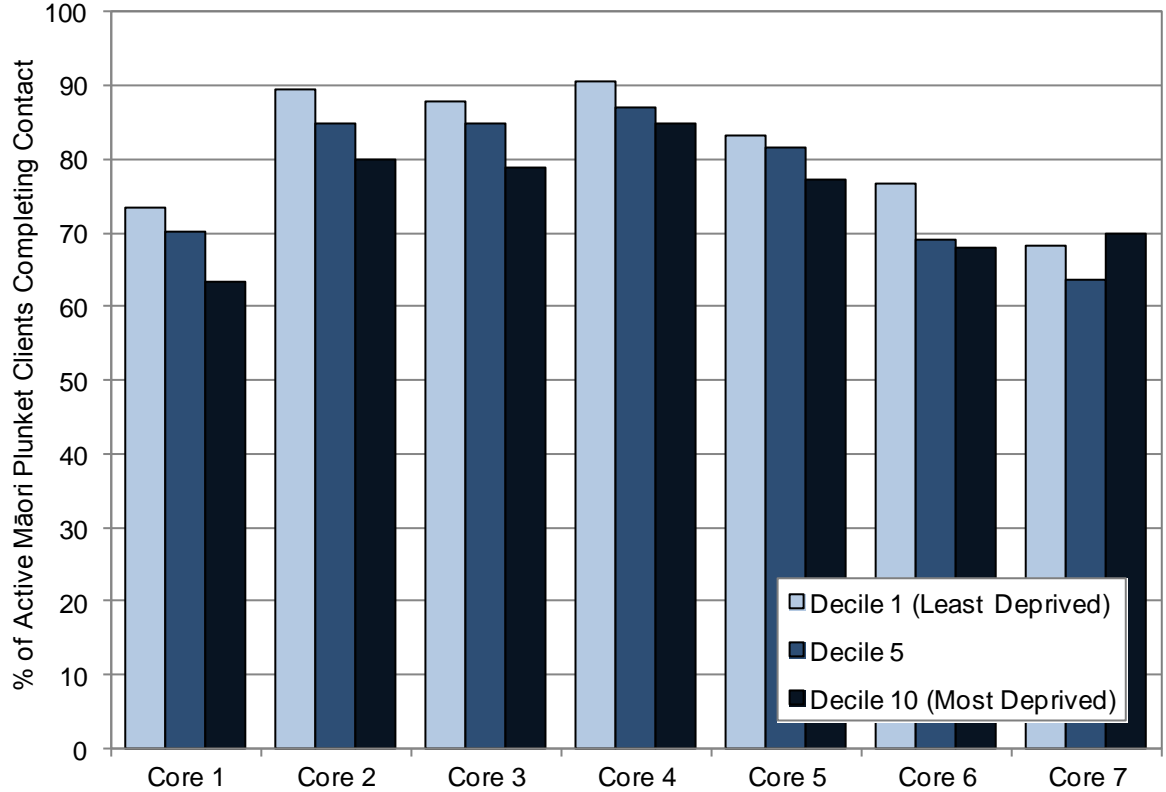
Figure 39. Proportion of New Zealand Children who Received their Core 1–5 Well Child Contacts by Ethnicity, Active Plunket Clients Born July 2010 to June 2011



Source: Plunket; Note: Birth cohort not yet old enough for Core 6 and 7

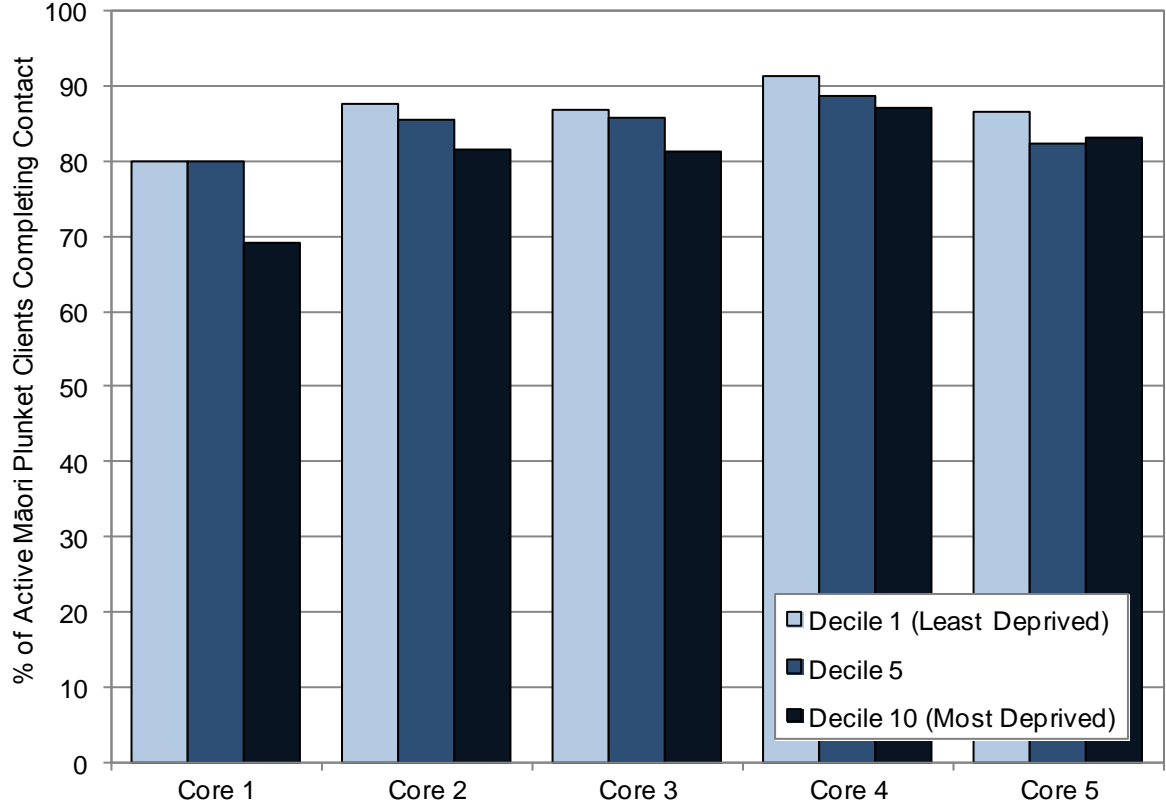


Figure 40. Proportion of Māori Children who Received their Core 1–7 Well Child Contacts by NZ Deprivation Index Decile, Active Plunket Clients Born July 2007 to June 2008



Source: Plunket; Note: Data is for Māori children only

Figure 41. Proportion of Māori Children who Received their Core 1–5 Well Child Contacts by NZ Deprivation Index Decile, Active Plunket Clients Born July 2010 to June 2011



Source: Plunket; Note: Birth cohort not yet old enough for Core 6 and 7; Data is for Māori children only

Table 18. Proportion of Children who Attended their Core 1–5 Well Child Contacts by DHB, Active Māori Plunket Clients Born During July 2010 to June 2011

DHB	Number of Active Māori Clients	% Māori Clients Receiving Core Well Child Contact				
		Core 1	Core 2	Core 3	Core 4	Core 5
Northland	887	63.6	74.5	76.2	85.0	78.6
Waitemata	971	79.9	86.9	86.3	89.9	83.5
Auckland	584	78.6	86.0	85.1	89.4	84.6
Counties Manukau	1,789	70.5	83.2	83.6	86.8	83.5
Waikato	1,555	76.7	84.3	83.5	88.9	84.2
Bay of Plenty	752	69.9	85.1	83.6	89.2	84.2
Lakes	451	75.2	89.6	86.9	89.4	84.0
Tairāwhiti	263	76.0	80.2	86.7	92.8	92.0
Taranaki	300	80.3	80.7	87.7	90.7	81.7
Hawke's Bay	543	76.6	83.2	85.1	89.0	85.5
MidCentral	490	80.0	86.1	91.0	89.6	84.7
Whanganui	235	80.0	88.5	86.4	87.2	83.0
Wairarapa	72	90.3	95.8	91.7	93.1	88.9
Hutt Valley	386	75.1	88.1	85.5	91.5	85.0
Capital and Coast	350	67.7	85.4	88.3	93.1	88.0
Nelson Marlborough	119	77.3	85.7	81.5	90.8	83.2
South Canterbury	74	81.1	90.5	85.1	93.2	86.5
Canterbury	585	77.9	76.6	79.5	82.6	75.2
West Coast	54	72.2	81.5	85.2	79.6	51.9
*Otago	253	79.8	90.1	91.7	93.7	89.7
*Southland	276	85.1	92.0	92.4	95.7	87.3
Not stated	53	66.0	79.2	77.4	88.7	81.1
New Zealand	11,042	74.9	84.0	84.5	88.7	83.5

Source: Plunket; Note: Birth cohort not yet old enough for Core 6 and 7; *Southern DHB

Local Policy Documents and Evidence-Based Reviews Relevant to Well Child/Tamariki Ora Services

The Determinants of Health for Children and Young People in New Zealand [6] provides a brief overview of local policy documents and evidence-based reviews Well Child/Tamariki Ora Services.



SUBSTANCE USE

SMOKING IN PREGNANCY

Introduction

The following section uses data from the National Maternity Collection to assess the proportion of Māori women who smoked at first registration with a Lead Maternity Carer (LMC), as well as the proportion of Māori women not registered with a LMC at the time of delivery (to assess any potential biases introduced by the incompleteness of the LMC data).

Background

Tobacco smoking during pregnancy is linked to a range of adverse health effects including placental abruption, miscarriage, stillbirth, preterm birth and low birthweight [87,88]. Maternal smoking also affects foetal growth and neurodevelopment and is associated with an increased risk of some congenital birth defects [89], as well as later Sudden Infant Death Syndrome (SIDS) [90].

In terms of prevalence, an analysis of the New Zealand College of Midwives database found a reduction in reported smoking among Māori women at booking visit, from 49.4% in 2004 to 42.9% in 2007, as compared to a reduction from 17.9% to 14.2% for European women [91]. Māori women saw the greatest reduction in smoking rates at discharge, a reduction in smoking rates of approximately 20% for Māori compared to 7% for NZ European. However, an exploratory qualitative study involving 60 pregnant Māori women found that motivation to quit was low [92]. In this study, all the women lived with other smokers and the majority socialised with smokers, highlighting the need to involve whānau in smoking cessation interventions.



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: National Maternity Collection: Number of babies born to mothers who were flagged as not being registered with a LMC at the time of delivery.

Denominator: National Maternity Collection: Number of babies born.

2. *Distribution of the number of cigarettes smoked at first registration with a lead maternity carer, by the mothers of newborn babies*

Numerator: National Maternity Collection: Number of cigarettes smoked per day at first registration with a lead maternity carer, by the mothers of newborn babies

Denominator: National Maternity Collection: Number of babies born

3. *Proportion of babies born to mothers who smoked at first registration with a lead maternity carer*

Numerator: National Maternity Collection: Number of babies born to mothers who smoked at first registration with a lead maternity carer

Denominator: National Maternity Collection: Number of babies born

Notes on Interpretation

In New Zealand primary maternity services are provided by Lead Maternity Carers (LMCs). Most LMCs are midwives, although some obstetricians and general practitioners also carry out this role. LMCs provide individualised care throughout pregnancy, the delivery and the first 4-6 weeks following delivery.

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 data from the National Minimum Dataset (NMDs) on hospital admissions during pregnancy, birth and the postnatal period for mother and 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 thus 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: In this analysis, the baby's hospital admission (birth) data from the NMDS was linked with maternal Section 88 claims data using a de-identified pregnancy key, with the unit of analysis being the baby rather than the mother (e.g. maternal information for twins is included twice in the analysis). Of the 129,635 babies born during 2009–2010, 1,113 (0.86%) were not able to be matched to their mother's MAT record.

Note 3: A relatively high proportion of babies (15.5%) had missing information on maternal smoking status at first LMC registration, with the majority of these babies having mothers who were not registered with a LMC. The proportion with missing information was thus not randomly distributed, but rather was higher for Pacific babies, those with younger mothers and those from more deprived areas. Large variations between DHBs were also evident. As a result, all of the data in this section have been presented both with missing smoking status included and excluded from the analysis. In interpreting these data, maternal smoking rates with missing responses included should be viewed as providing an absolute minimum estimate of the number of babies whose mother's smoked at first LMC registration. While maternal smoking rates with missing responses excluded may provide a closer approximation of the true rate, they may still be an underestimate. For example, a higher proportion of babies with younger mothers and those from more deprived areas had missing smoking status data, as well as higher smoking rates amongst those for whom maternal smoking status was known.

Note 4: MAT does not contain details on stillborn babies as they are not assigned a NHI number at birth and are thus not reported to the National Minimum Dataset.

Babies Born to Mothers Not Registered with a LMC at Delivery

Distribution by Ethnicity

In New Zealand during 2009–2010, 16.3% of Māori babies were born to mothers who were not registered with a LMC at the time of delivery, with this proportion being *significantly* higher than for non-Māori non-Pacific babies (12.1%). 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 19**).

Table 19. Status of Maternal Registration with a Lead Maternity Carer at the Time of Delivery by Ethnicity for New Zealand Babies Born 2009–2010

Baby's Ethnicity	No. of Babies: Annual Average			Mother Not Registered: Rate per 100 Babies (%)	Rate Ratio	95% CI
	Mother Not Registered with LMC	Mother Registered with LMC	Total			
Māori	2,750	14,119	16,869	16.3	1.34	1.30–1.38
non-Māori non-Pacific	4,873	35,253	40,126	12.1	1.00	

Source: National Maternity Collection; Note: Information is for live born babies only

Maternal Smoking at First Registration with a LMC

Distribution by Number of Cigarettes Smoked

In New Zealand during 2009–2010, 16.0% of Māori babies did not have their mother's smoking status at first LMC registration recorded in the National Maternity Collection, with the majority of omissions being for babies whose mothers were not registered with a LMC at delivery. Of those babies whose mother's smoking status was known 61.9% had a non-smoking mother, while 23.2% had a mother who smoked less than 10 cigarettes per day and 14.9% had a mother who smoked 10 or more cigarettes per day (**Table 20**).

Distribution by Ethnicity

In New Zealand during 2009–2010, on average at least 5,497 Māori babies each year were born to mothers who smoked at first LMC registration, with the proportion of Māori babies with mothers who smoked being *significantly* higher than for non-Māori non-Pacific babies (**Table 21**).

Table 20. Number of Cigarettes Smoked Daily, at First Registration with a Lead Maternity Carer, by the Mothers of Babies Born in New Zealand 2009–2010

No. of Cigarettes Smoked per Day	No. of Babies: Total 2009–2010	No. of Babies: Annual Average	Percent of Babies (%)	
			Unknown Smoking Status Included	Unknown Smoking Status Excluded
Maternal Smoking at LMC Registration				
Māori				
Non-Smoker	17,845	8,923	52.0	61.9
<10	6,703	3,352	19.5	23.2
10–20	3,793	1,897	11.0	13.2
>20	498	249	1.5	1.7
Unknown	5,491	2,746	16.0	
Total	34,330	17,165	100.0	100.0
non-Māori non-Pacific				
Non-Smoker	65,145	32,573	80.9	91.6
<10	3,924	1,962	4.9	5.5
10–20	1,853	927	2.3	2.6
>20	235	118	0.3	0.3
Unknown	9,383	4,692	11.7	
Total	80,540	40,270	100.0	100.0

Source: National Maternity Collection; Note: Information is for live born babies only; See Note 3 in Methods section regarding the potential impact of missing data on maternal smoking rates

Table 21. Proportion of Babies Born to Mothers who Smoked, at First Registration with a Lead Maternity Carer, by Baby's Ethnicity, New Zealand 2009–2010

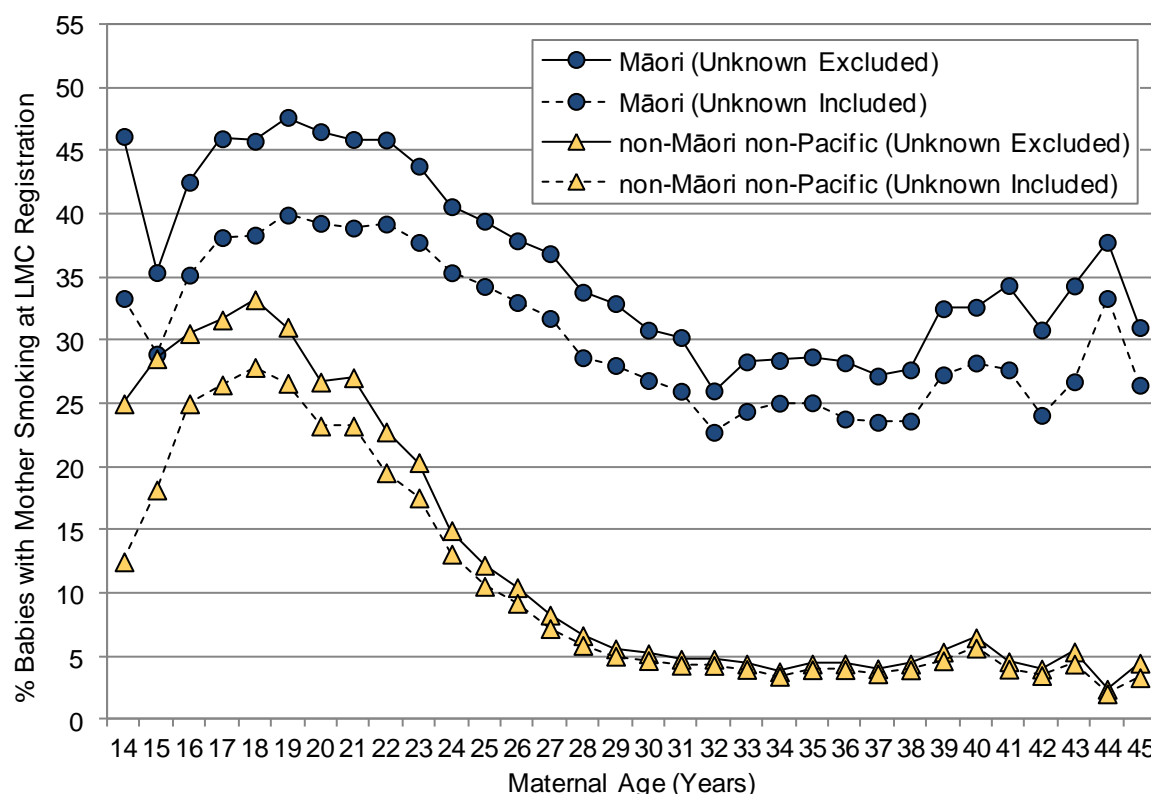
Baby's Ethnicity	No. of Babies with Maternal Smoker: Total 2009–2010	No. of Babies with Maternal Smoker: Annual Average	Percent of Babies with Maternal Smoker (%)	Rate Ratio	95% CI
Maternal Smoking at LMC Registration					
Unknown Smoking Status Included					
Māori	10,994	5,497	32.0	4.29	4.17–4.42
non-Māori non-Pacific	6,012	3,006	7.5	1.00	
Unknown Smoking Status Excluded					
Māori	10,994	5,497	38.1	4.51	4.39–4.64
non-Māori non-Pacific	6,012	3,006	8.4	1.00	

Source: National Maternity Collection; Note: Information is for live born babies only; See Note 3 in Methods section regarding the potential impact of missing data on maternal smoking rates

Distribution by Maternal Age and Ethnicity

In New Zealand during 2009–2010, when broken down by maternal age and baby's ethnicity, the mothers of Māori babies, regardless of maternal age, had higher smoking rates at first LMC registration than the mothers of non-Māori non-Pacific babies. The highest smoking rates in both ethnic groups however, were seen amongst mothers in their teens and early twenties (**Figure 42**).

Figure 42. Proportion of Babies Born to Mothers who Smoked at First Registration with a Lead Maternity Carer by Baby's Ethnicity and Maternal Age, New Zealand 2009–2010



Source: National Maternity Collection; Note: Information is for live born babies only; See Note 3 in Methods section regarding the potential impact of missing data on maternal smoking rates

Distribution by Ethnicity and District Health Board

In New Zealand during 2009–2010, the proportion of Māori babies whose mothers smoked at first LMC registration varied considerably by DHB, with maternal smoking rates (unknown smoking status excluded from denominator) ranging from 21.2% for babies in the Auckland DHB, to 47.9% for babies in the Bay of Plenty. In each DHB, with the exception of the West Coast, maternal smoking rates for Māori babies were *significantly* higher than for non-Māori non-Pacific babies (**Table 22, Table 23**).

New Zealand Distribution

Distribution by Maternal Age and NZDep Decile

In New Zealand during 2009–2010, the babies of younger mothers (less than 30 years vs. 30 or more years) were *significantly* more likely to have mothers who smoked at first LMC registration. 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 at first LMC registration.

Table 22. Proportion of Babies whose Mother Smoked at First Registration with a Lead Maternity Carer by Ethnicity and District Health Board, Unknown Smoking Status Included, New Zealand 2009–2010

District Health Board	No. of Babies: Annual Average 2009–2010		% Māori Babies with Maternal Smoker	% non-Māori non-Pacific Babies with Maternal Smoker	Rate Ratio	95% CI
	No. Māori Babies	No. Māori Babies with Maternal Smoker				
Maternal Smoking at LMC Registration						
Unknown Smoking Status Included						
Northland	1,364	367	26.9	7.7	3.49	2.97–4.12
Waitemata	1,514	368	24.3	4.2	5.75	5.15–6.42
Auckland	878	129	14.6	1.1	13.20	10.56–16.51
Counties Manukau	2,171	582	26.8	4.6	5.84	5.19–6.56
Waikato	2,097	735	35.0	10.5	3.32	3.06–3.60
Lakes	886	362	40.8	10.5	3.90	3.32–4.58
Bay of Plenty	1,314	625	47.6	10.8	4.42	3.98–4.92
Tairāwhiti	550	246	44.7	8.9	5.01	3.70–6.78
Taranaki	515	196	38.1	12.9	2.95	2.58–3.38
Hawke's Bay	1,099	381	34.7	10.1	3.43	3.00–3.91
MidCentral	754	257	34.0	12.4	2.73	2.43–3.08
Whanganui	382	85	22.3	11.0	2.02	1.62–2.52
Hutt Valley	633	198	31.3	8.5	3.69	3.18–4.29
Capital and Coast	729	189	25.9	2.7	9.48	7.94–11.31
Wairarapa	162	51	31.6	12.3	2.57	2.00–3.31
Nelson Marlborough	289	79	27.2	7.5	3.63	3.01–4.37
South Canterbury	83	35	41.6	16.4	2.54	2.03–3.17
Canterbury	964	347	35.9	9.2	3.90	3.59–4.25
West Coast	63	8	12.8	5.7	2.26	1.31–3.91
*Otago	300	98	32.6	12.1	2.70	2.33–3.12
*Southland	334	134	40.0	13.9	2.87	2.52–3.28

Source: National Maternity Collection; Note: Information is for live born babies only; Rate Ratio compares rates for Māori and non-Māori non-Pacific babies within each DHB; See Note 3 in Methods section regarding the potential impact of missing data on maternal smoking rates; *Southern DHB

Table 23. Proportion of Babies whose Mother Smoked at First Registration with a Lead Maternity Carer by Ethnicity and District Health Board, Unknown Smoking Status Excluded, New Zealand 2009–2010

District Health Board	No. of Babies: Annual Average 2009–2010		% Māori Babies with Maternal Smoker	% non-Māori non-Pacific Babies with Maternal Smoker	Rate Ratio	95% CI
	No. Māori Babies	No. Māori Babies with Maternal Smoker				
Maternal Smoking at LMC Registration						
Unknown Smoking Status Excluded						
Northland	893	367	41.0	9.7	4.21	3.59–4.95
Waitemata	1,279	368	28.7	4.7	6.11	5.48–6.81
Auckland	607	129	21.2	1.4	15.32	12.28–19.11
Counties Manukau	1,475	582	39.5	6.2	6.38	5.69–7.15
Waikato	1,841	735	39.9	11.3	3.53	3.25–3.82
Lakes	830	362	43.6	11.0	3.98	3.39–4.66
Bay of Plenty	1,306	625	47.9	10.8	4.42	3.97–4.92
Tairāwhiti	541	246	45.5	9.0	5.04	3.72–6.82
Taranaki	500	196	39.2	13.2	2.98	2.60–3.40
Hawke's Bay	934	381	40.8	10.7	3.81	3.34–4.35
MidCentral	706	257	36.4	13.6	2.68	2.38–3.01
Whanganui	212	85	40.1	16.3	2.46	2.00–3.02
Hutt Valley	546	198	36.3	9.3	3.90	3.37–4.52
Capital and Coast	650	189	29.0	3.1	9.48	7.95–11.30
Wairarapa	135	51	37.8	13.6	2.79	2.18–3.56
Nelson Marlborough	223	79	35.2	10.0	3.52	2.94–4.22
South Canterbury	80	35	43.1	16.7	2.58	2.07–3.22
Canterbury	942	347	36.8	9.5	3.87	3.56–4.21
West Coast	29	8	27.6	18.0	1.53	0.93–2.53
*Otago	299	98	32.6	12.1	2.69	2.32–3.12
*Southland	316	134	42.3	15.4	2.74	2.40–3.12

Source: National Maternity Collection; Note: Information is for live born babies only; Rate Ratio compares rates for Māori and non-Māori non-Pacific babies within each DHB; See Note 3 in Methods section regarding the potential impact of missing data on maternal smoking rates; *Southern DHB

Local Policy Documents and Evidence-Based Reviews Relevant to Smoking Cessation in Pregnancy

The Determinants of Health for Children and Young People in New Zealand [6] provides a brief overview of local policy documents and evidence-based reviews which consider interventions to promote smoking cessation during pregnancy.

SECOND-HAND CIGARETTE SMOKE EXPOSURE

Introduction

The following section uses data from the National Maternity Collection to review the proportion of Māori babies with mothers who smoked at two weeks after delivery. A later section uses Action on Smoking and Health (ASH) survey data to review the proportion of Year 10 Māori students with parents who smoked, or who lived in homes where people smoked inside.

Background

In New Zealand, it has been estimated that 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 annually [93]. Household smoking, particularly by parents, also significantly increases the risk of uptake of smoking amongst children [94].

In terms of prevalence, in 2011 the Māori Smoking and Tobacco Use Profile found that children living in Māori households were significantly more likely to be exposed to second hand smoke at home than those in non-Māori households [95]. Similarly, the National Year 10 ASH Snapshot Survey, which sampled 32,605 year 10 students (14 to 15 year olds) in 2010, found that 62.7% of year 10 Māori students reported that one or both parents smoked, compared to 31.7% of European students [96]. More Māori students also reported that smoking occurred inside the home (31.7%) than their European counterparts (16.1%). However, between 2006 and 2010 there was a significant decrease in the proportion of Māori students reporting that people smoked in their homes (adjusted OR 0.71, 95% CI 0.66–0.77).

Maternal Smoking at Two Weeks After Delivery

The National Maternity Collection (MAT) collates Lead Maternity Carer (LMC) claims data, with information being available on maternal smoking status at two weeks after delivery for around 80% of all New Zealand births. The following section uses data from the MAT to review the proportion of Māori babies with mothers who smoked at two weeks after delivery.

Data Sources and Methods

Indicator

1. *Distribution of the number of cigarettes smoked at two weeks after delivery by the mothers of babies born 2009–2010*

Numerator: National Maternity Collection: Number of cigarettes smoked at two weeks after delivery, by the mothers of babies born 2009–2010

Denominator: National Maternity Collection: Number of babies born.

2. *Proportion of babies born to mothers who smoked at two weeks after delivery*

Numerator: National Maternity Collection: Number of babies born to mothers who smoked at two weeks after delivery

Denominator: National Maternity Collection: Number of babies born.

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 data from the National Minimum Dataset (NMDS) on hospital admissions during pregnancy, birth and the postnatal period for mother and 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.

Note 2: In this analysis, the baby's hospital admission (birth) data from the NMDS was linked with maternal Section 88 claims data using a de-identified pregnancy key, with the unit of analysis being the baby rather than



the mother (e.g. maternal information for twins is included twice in the analysis). Of the 129,635 babies born during 2009–2010, 1,113 (0.86%) were not able to be matched to their mother's MAT record.

Note 3: A relatively high proportion of babies (19.4% during 2009–2010) had missing information on maternal smoking status at two weeks after delivery, with the majority of these babies having mothers who were not registered with a LMC. The proportion with missing information was thus not randomly distributed, but rather was higher for Pacific babies, those with younger mothers and those from more deprived areas. Large DHB variations were also evident (see Smoking in Pregnancy Section for further details). As a result, all of the data in this section have been presented with missing smoking status both included and excluded from the analysis. In interpreting these data, maternal smoking rates with missing responses included should be viewed as providing an absolute minimum estimate of the number of babies whose mother's smoked at two weeks after delivery. While maternal smoking rates with missing responses excluded may provide a closer approximation of the true rate, they may still be an underestimate, as a higher proportion of babies with younger mothers and those from more deprived areas, for example, had missing smoking status data as well as higher smoking rates amongst those for whom maternal smoking status was known.

Note 4: MAT does not contain details on stillborn babies as they are not assigned a NHI number at birth and are thus not reported to the National Minimum Dataset.

Distribution by Number of Cigarettes Smoked

In New Zealand during 2009–2010, 20.5% of Māori babies did not have their mother's smoking status at two weeks after delivery recorded in the National Maternity Collection, with the majority of omissions being for babies whose mothers were unregistered with a LMC at delivery. Of those babies whose mother's smoking status was known, 64.3% had a non-smoking mother, while 21.9% had a mother who smoked less than 10 cigarettes per day and 13.8% had a mother who smoked 10 or more cigarettes per day (**Table 24**).

Table 24. Number of Cigarettes Smoked at Two Weeks After Delivery, by the Mothers of New Zealand Babies Born 2009–2010

No. of Cigarettes Smoked per Day	No. of Babies: Total 2009–2010	No. of Babies: Annual Average	Percent of Babies (%)	
			Unknown Smoking Status Included	Unknown Smoking Status Excluded
Maternal Smoking at Two Weeks After Delivery				
Māori				
Non-Smoker	17,528	8,764	51.1	64.2
<10	5,976	2,988	17.4	21.9
10–20	3,311	1,656	9.6	12.1
>20	466	233	1.4	1.7
Unknown	7,049	3,525	20.5	
Total	34,330	17,165	100.0	100.0
non-Māori non-Pacific				
Non-Smoker	62,981	31,491	78.2	92.3
<10	3,401	1,701	4.2	5.0
10–20	1,611	806	2.0	2.4
>20	229	115	0.3	0.3
Unknown	12,318	6,159	15.3	
Total	80,540	40,270	100.0	100.0

Source: National Maternity Collection; Note: See Note 3 in Methods section regarding the potential impact of missing data on maternal smoking rates

Distribution by Ethnicity

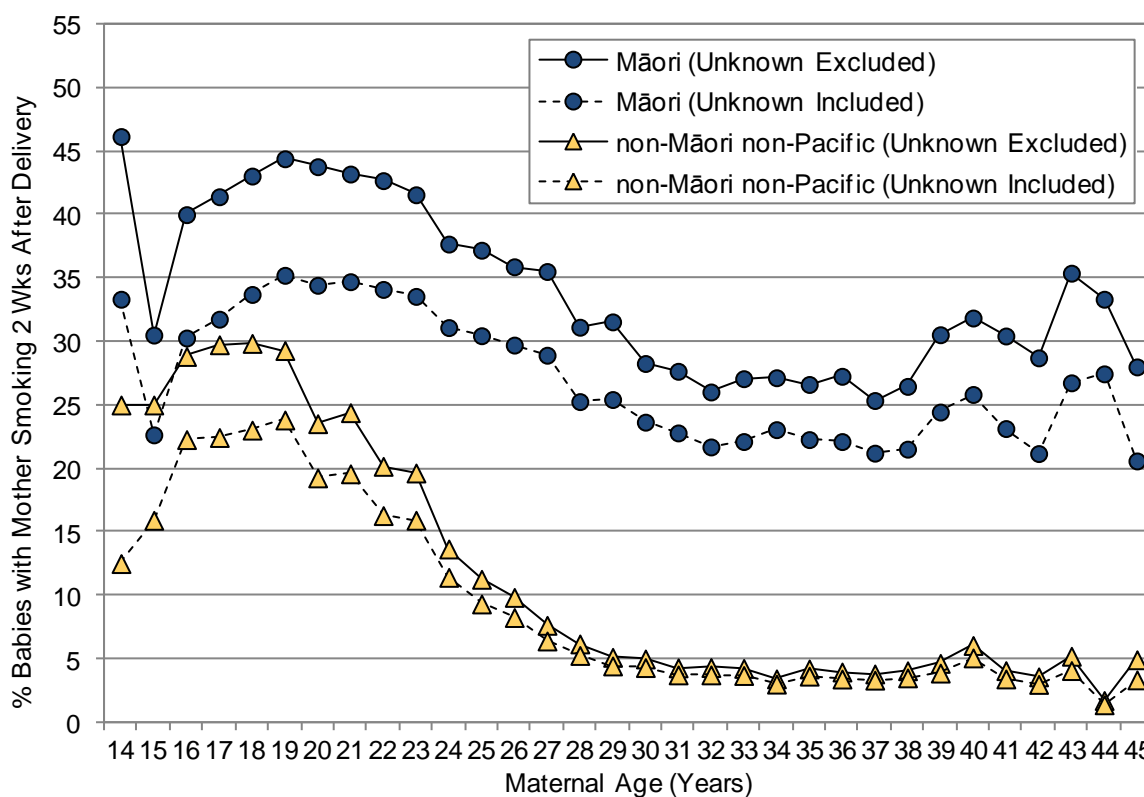
In New Zealand during 2009–2010, on average at least 4,880 Māori babies each year were born to mothers who smoked at two weeks after delivery, with the proportion of Māori babies with mothers who smoked being *significantly* higher than for non-Māori non-Pacific babies (Table 25).

Table 25. Proportion of Babies Born to Mothers who Smoked at Two Weeks After Delivery by Baby's Ethnicity, New Zealand 2009–2010

Baby's Ethnicity	No. of Babies with Maternal Smoker: Total 2009–2010	No. of Babies with Maternal Smoker: Annual Average	Percent of Babies with Maternal Smoker (%)	Rate Ratio	95% CI
Maternal Smoking at Two Weeks After Delivery					
Unknown Smoking Status Included					
Māori	9,759	4,880	28.4	4.36	4.22–4.49
non-Māori non-Pacific	5,257	2,629	6.5	1.00	
Unknown Smoking Status Excluded					
Māori	9,759	4,880	35.8	4.64	4.50–4.79
non-Māori non-Pacific	5,257	2,629	7.7	1.00	

Source: National Maternity Collection; Note: See Note 3 in Methods section regarding the potential impact of missing data on maternal smoking rates

Figure 43. Proportion of Babies Born to Mothers who Smoked at Two Weeks After Delivery by Baby's Ethnicity and Maternal Age, New Zealand 2009–2010



Source: National Maternity Collection; Note: See Note 3 in Methods section regarding the potential impact of missing data on maternal smoking rates

Distribution by Maternal Age and Ethnicity

In New Zealand during 2009–2010, when broken down by maternal age and baby's ethnicity, the mothers of Māori babies, regardless of maternal age, had higher smoking rates at two weeks after delivery than the mothers of non-Māori non-Pacific babies, with the highest smoking rates in both ethnic groups being seen amongst mothers in their teens and early twenties (**Figure 43**).

Distribution by Ethnicity and District Health Board

In New Zealand during 2009–2010, the proportion of Māori babies whose mothers smoked at two weeks after delivery varied considerably by DHB, with maternal smoking rates (unknown smoking status excluded from denominator) ranging from 19.4% for babies in the Auckland DHB, to 46.8% for babies in Tairāwhiti. In each DHB, with the exception of the West Coast, maternal smoking rates for Māori babies were *significantly* higher than for non-Māori non-Pacific babies (**Table 26**, **Table 27**).

Table 26. Proportion of Babies whose Mother Smoked at Two Weeks After Delivery by Ethnicity and District Health Board, Unknown Smoking Status Included, New Zealand 2009–2010

District Health Board	No. of Babies: Annual Average 2009–2010		% Māori Babies with Maternal Smoker	% non-Māori non-Pacific Babies with Maternal Smoker	Rate Ratio	95% CI
	No. Māori Babies	No. Māori Babies with Maternal Smoker				
Maternal Smoking at Two Weeks After Delivery						
Unknown Smoking Status Included						
Northland	1,364	333	24.4	7.2	3.37	2.84–4.00
Waitemata	1,514	313	20.6	3.6	5.77	5.11–6.51
Auckland	878	111	12.6	1.0	12.59	9.92–15.97
Counties Manukau	2,171	482	22.2	3.5	6.33	5.54–7.24
Waikato	2,097	658	31.4	9.1	3.46	3.16–3.77
Lakes	886	316	35.6	8.8	4.06	3.41–4.85
Bay of Plenty	1,314	551	41.9	9.0	4.65	4.13–5.24
Tairāwhiti	550	240	43.5	7.8	5.57	4.03–7.72
Taranaki	515	184	35.8	11.7	3.05	2.64–3.51
Hawke's Bay	1,099	349	31.7	9.5	3.34	2.91–3.84
MidCentral	754	232	30.8	10.9	2.82	2.48–3.20
Whanganui	382	62	16.1	8.5	1.89	1.46–2.44
Hutt Valley	633	156	24.6	6.5	3.79	3.19–4.51
Capital and Coast	729	173	23.7	2.2	10.81	8.89–13.14
Wairarapa	162	48	29.7	10.5	2.83	2.16–3.71
Nelson Marlborough	289	74	25.6	6.8	3.75	3.08–4.56
South Canterbury	83	35	41.6	14.8	2.81	2.24–3.53
Canterbury	964	313	32.5	8.1	4.00	3.65–4.37
West Coast	63	6	8.8	4.8	1.83	0.95–3.51
*Otago	300	95	31.7	11.7	2.72	2.34–3.15
*Southland	334	126	37.6	13.3	2.83	2.46–3.25

Source: National Maternity Collection; Note: See Note 3 in Methods section regarding the potential impact of missing data on maternal smoking rates; *Southern DHB

Table 27. Proportion of Babies whose Mother Smoked at Two Weeks After Delivery by Ethnicity and District Health Board, Unknown Smoking Status Excluded, New Zealand 2009–2010

District Health Board	No. of Babies: Annual Average 2009–2010		% Māori Babies with Maternal Smoker	% non-Māori non-Pacific Babies with Maternal Smoker	Rate Ratio	95% CI
	No. Māori Babies	No. Māori Babies with Maternal Smoker				
Maternal Smoking at Two Weeks After Delivery						
Unknown Smoking Status Excluded						
Northland	819	333	40.7	9.7	4.20	3.55–4.95
Waitemata	1,211	313	25.8	4.1	6.24	5.54–7.03
Auckland	571	111	19.4	1.3	15.00	11.86–18.97
Counties Manukau	1,382	482	34.8	5.0	7.02	6.16–8.00
Waikato	1,775	658	37.1	10.0	3.72	3.41–4.05
Lakes	789	316	40.0	9.7	4.14	3.47–4.93
Bay of Plenty	1,268	551	43.4	9.3	4.68	4.16–5.27
Tairāwhiti	512	240	46.8	8.5	5.54	4.01–7.66
Taranaki	468	184	39.4	13.1	3.01	2.62–3.47
Hawke's Bay	843	349	41.4	10.8	3.84	3.35–4.39
MidCentral	683	232	34.0	12.5	2.71	2.39–3.07
Whanganui	184	62	33.5	14.3	2.35	1.84–2.99
Hutt Valley	510	156	30.5	7.6	4.02	3.39–4.76
Capital and Coast	625	173	27.6	2.5	10.87	8.95–13.20
Wairarapa	124	48	38.7	12.5	3.09	2.38–4.01
Nelson Marlborough	212	74	35.0	9.5	3.69	3.06–4.46
South Canterbury	76	35	45.7	16.3	2.80	2.24–3.49
Canterbury	901	313	34.7	8.6	4.02	3.68–4.40
West Coast	24	6	23.4	18.6	1.26	0.69–2.29
*Otago	293	95	32.4	12.0	2.71	2.33–3.14
*Southland	303	126	41.4	15.5	2.68	2.34–3.06

Source: National Maternity Collection; Note: See Note 3 in Methods section regarding the potential impact of missing data on maternal smoking rates; *Southern DHB

New Zealand Distribution

Distribution by Maternal Age and NZDep Decile

In New Zealand during 2009–2010, the babies of younger mothers (less than 30 years vs. 30 or more years) were *significantly* more likely to have mothers who smoked at two weeks after delivery. 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 at two weeks after delivery.

Exposure to Second-Hand Cigarette Smoke in the Home

Action on Smoking and Health (ASH) was established in 1982 with the aim of reducing smoking and smoking-related premature deaths. Since 1997, ASH has conducted annual surveys of smoking behaviour in Year 10 students, and since 1999 has collected information from over 30,000 students annually. The following section uses ASH Survey data to review the proportion of Year 10 Māori students with parents who smoke, or who live in homes where people smoke inside.

Data Source and Methods

Definition

1. Proportion of Year 10 students with parents who smoke

Numerator: ASH Surveys: Number of Year 10 students who report that one or both parents smoke

Denominator: ASH Survey: Number of Year 10 Students surveyed

2. Proportion of Year 10 students or who live in a home where people smoke inside

Numerator: ASH Surveys: Number of Year 10 students living in a home where people smoke inside

Denominator: ASH Survey: 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 Year 10 (14 to 15 years) Smoking Survey, ASH manages the data collection and oversees its analysis [97]. Since 1997, ASH has conducted annual surveys of smoking behaviour in Year 10 students, and since 1999 has collected information from over 30,000 students annually. All schools with Year 10 students (except correspondence schools) are invited to participate, with survey packs being sent to consenting schools. Teachers supervise the completion of the questionnaires in class, with questions covering a range of demographic factors and smoking-related topics. While it has been suggested that this design means it is not always clear how the sample has been selected and how consistently the survey has been administered, the large sample size and annual frequency makes the survey useful for monitoring the smoking behaviour of Year 10 students and for understanding trends and risk factors for smoking initiation [98].

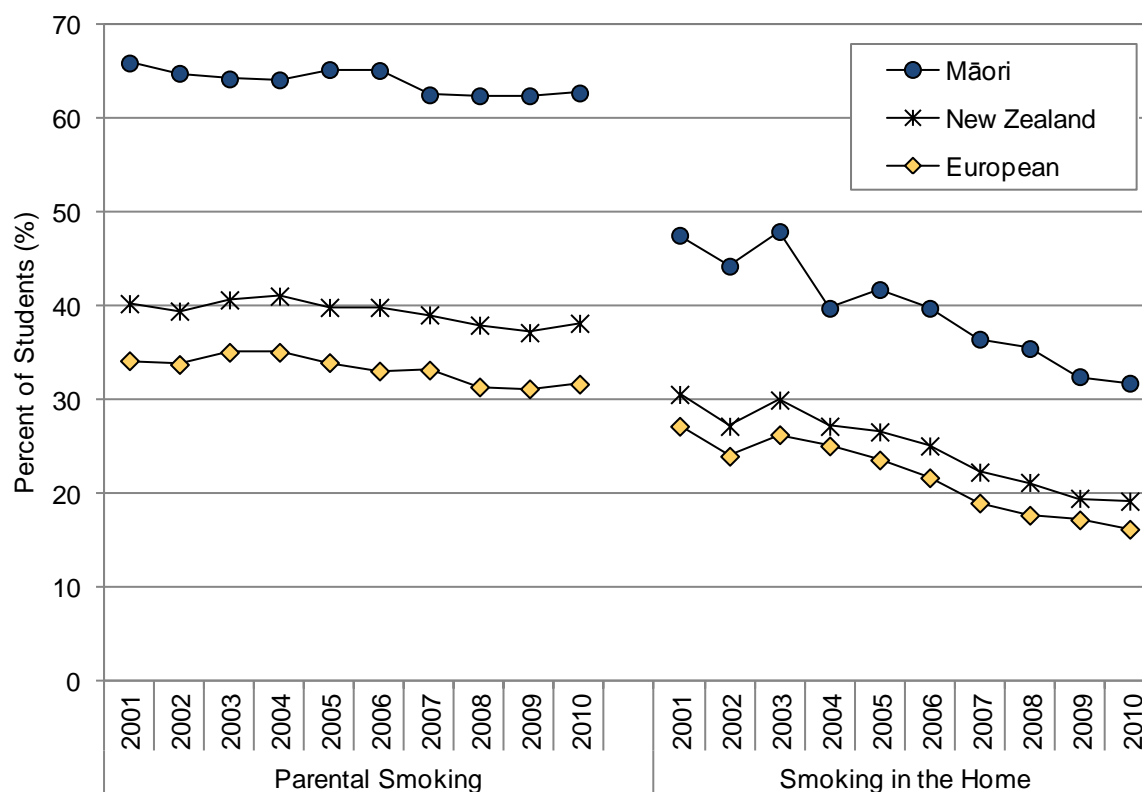
Note 2: Since 2001 participation rates have fluctuated, with school response rates of 67% in 2002 falling to 47% in 2007, before increased again to 54% in 2008, and 58% in 2010 (in 2010 the sample comprised 54% of the Year 10 population). Such variable participation rates however may potentially introduce a fluctuating bias into each year's results. For example, the 2008 survey was under-representative of Māori students and those from low decile schools, with this underrepresentation potentially leading to an underestimates of smoking rates in the 2008 sample [99]. However the 2010 survey had a very similar gender and ethnicity distribution to the national Year 10 population [96].

Ethnic Differences in Parental and Household Smoking Behaviour

In New Zealand during 2001–2010, parental smoking rates for 14–15 year old Māori students declined (65.9% in 2001 to 62.7% in 2010), with these declines being statistically *significant* during 2006–2010. There were however, no *significant* changes in parental smoking rates for European students during 2006–2010, although rates did fall from 34.1% in 2001 to 31.6% in 2010. Throughout this period, parental smoking rates remained higher for Māori students than for European students (**Figure 44**).

The proportion of 14–15 year old students living in homes where people smoked inside also declined, from 47.5% in 2001 to 31.7% in 2010 for Māori students and from 27.1% to 16.1% for European students, with these declines being *significant* for both ethnic groups during 2006–2010. Throughout this period, the proportion of Māori students living in homes where people smoked inside remained higher than for European students (**Figure 44**).

Figure 44. Proportion of Year 10 Students with Parents who Smoke or who Live in a Home with Smoking Inside by Ethnicity, New Zealand ASH Surveys 2001–2010



Source: ASH Year 10 Surveys [96]; Note: Ethnicity is prioritised

New Zealand Distribution

Trends in Parental and Household Smoking Behaviour

In New Zealand during 2001–2010, the proportion of Year 10 students with a parent(s) who smoked did not change *significantly*, being 40.2% in 2001 and 38.1% in 2010. In contrast, the proportion of students who lived in homes where smoking occurred inside declined *significantly*, from 30.5% in 2001 to 19.1% in 2010.

Socioeconomic Differences in Parental and Household Smoking

In New Zealand during 2001–2010, parental smoking rates declined *significantly* for students from schools in the least deprived (deciles 8–10) areas, with rates falling from 30.6% in 2001 to 26.8% in 2010. However, rates for students from schools in average (deciles 4–7) areas were relatively static (43.5% in 2001 vs. 42.3% in 2010), as were rates for students from schools in the most deprived (deciles 1–3) areas (55.7% in 2001 vs. 53.7% in 2010). Throughout this period, parental smoking rates were higher for students from schools in the most deprived > average > least deprived areas.

Exposure to smoking in the home was also higher for those from schools in the most deprived > average > least deprived areas, although exposures were lower than parental smoking rates might predict, suggesting that a proportion of families with household members who smoked did not permit smoking inside the home. During 2001–2010, exposure to smoking in the home declined *significantly* for all socioeconomic groups (deciles 8–10, from 23.2% in 2001 to 13.2% in 2010; deciles 4–7, from 34.0% in 2001 to 21.3% in 2010; and deciles 1–3, from 39.9% in 2001 to 27.3% in 2010).

Local Policy Documents and Evidence-Based Reviews Relevant to Second-Hand Cigarette Smoke Exposure in Children

The Determinants of Health for Children and Young People in New Zealand [6] provides a brief overview of local policy documents and evidence-based reviews relevant to second-hand cigarette smoke exposures in children.

TOBACCO USE IN YOUNG PEOPLE

Introduction

The following section reviews smoking prevalence in Māori 14–15 year olds using data from the ASH New Zealand Smoking Surveys, as well as smoking in Māori young people aged 15–19 years using data from the 2009 New Zealand Tobacco Use Survey.

Background

Cigarette smoking in young people is associated with addiction to nicotine, reduced lung function, reduced lung growth and asthma [100]. In New Zealand, the average age for smoking initiation among young people is 14.6 years, with the majority of adult smokers starting smoking in adolescence [101,102]. Those who do not smoke before the age of 20 are significantly less likely to start as adults [103].

While the prevalence of smoking amongst young people appears to be declining [104], the 2011 Māori Smoking and Tobacco Use Profile found that Māori young people have a higher prevalence of smoking than their non-Māori peers [95]. Similarly, the National Year 10 ASH Snapshot Survey, which sampled 32,605 year 10 students (14 to 15 year olds) in 2010, found that while there was a significant decline in smoking between 2006 and 2010 (adjusted OR for regular smoking 0.65, 95% CI 0.62–0.69) [96], that the highest prevalence of smoking was reported by Māori females. Overall, smoking rates were significantly higher for Māori students than for European/other students, after adjustment for age and sex. Students were also significantly more likely to smoke if both parents smoked, than if neither parent smoked, and if they had a best friend who smoked. Adolescent smoking in New Zealand has also been linked to the amount of pocket money received and to smoking at home [105].

ASH Year 10 Survey Data

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, with sample sizes exceeding 25,000 students each year [106]. The results thus reflect the smoking behaviour of 14 to 15 year old secondary school students and are useful in 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

Numerator: ASH Surveys Number of Year 10 students who are daily smokers
Number of Year 10 students who have never smoked

Denominator: ASH Survey 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 [97]. 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 [98].

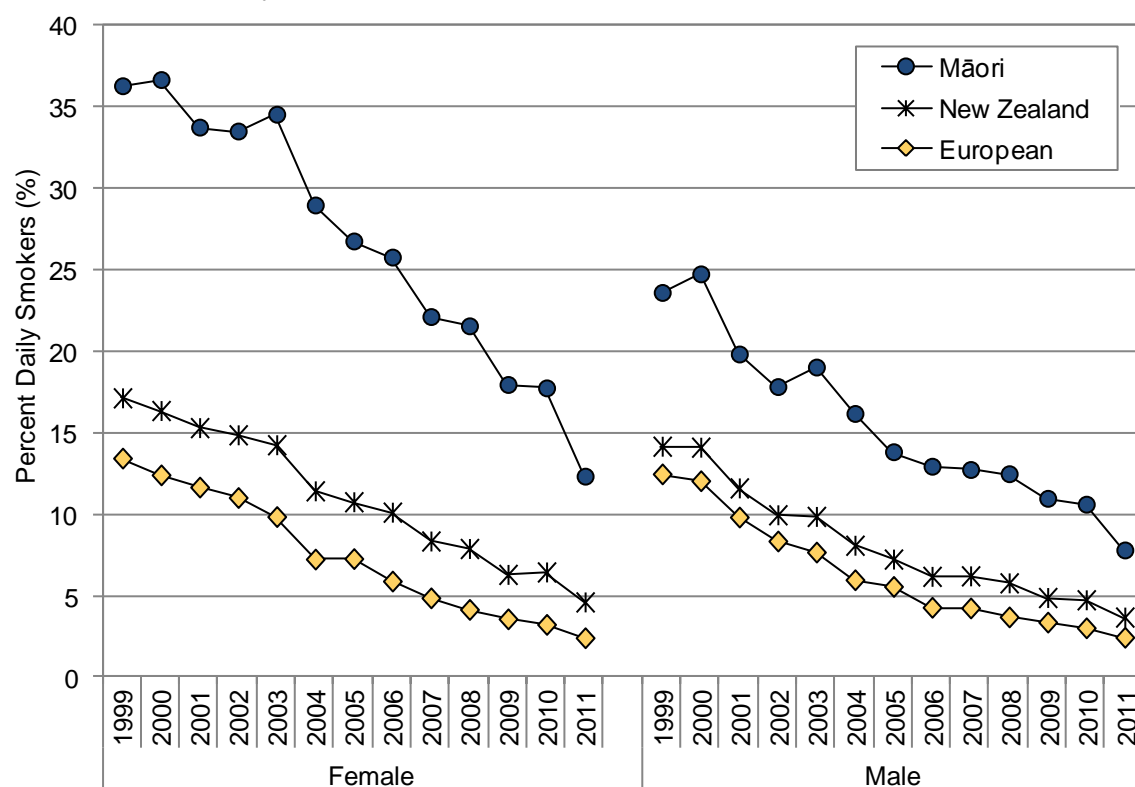
Note 3: In 2000 and 2001, over 70% of schools in NZ participated and of these, 70% of enrolled students took part [107]. Since then however, participation rates have declined, with school response rates being 67% in 2002, 66% in 2003, 65% in 2004, 58% in 2005, 57% in 2006, 47% in 2007 and 54% in 2008. 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 [99].

All of the data in this section was downloaded from <http://www.ash.org.nz/?t=157>

Distribution by Gender and Ethnicity

In New Zealand during 1999–2011, daily smoking rates for Māori students declined, with rates falling from 36.3% in 1999 to 12.3% in 2011 for Māori females and from 23.6% to 7.8% for Māori males. Daily smoking rates for Māori females remained higher than for Māori males during this period, with rates for Māori students of both genders also remaining higher than for European students (Figure 45).

Figure 45. Daily Smoking Rates in Year 10 Students by Gender and Ethnicity, New Zealand ASH Surveys 1999–2011



Source: ASH Year 10 Surveys [108]; Note: Ethnicity is prioritised

New Zealand Distribution

New Zealand Trends

In New Zealand during 1999–2011 the proportion of Year 10 students who were daily smokers declined, from 15.6% in 1999 to 4.1% in 2011. Similarly, the proportion who had never smoked increased, from 31.6% in 1999 to 70.4% in 2011.

Distribution by Gender and Socioeconomic Status

In New Zealand during 1999–2011, daily smoking rates were higher for students attending schools in the most deprived (deciles 1–3) > average (deciles 4–7) > least deprived (deciles 8–10) areas. While gender differences were again evident, these diminished as the level of deprivation decreased, with the higher female smoking rates seen in the most deprived schools, virtually disappearing in the least deprived schools. Daily smoking rates declined for students of all socioeconomic groups during 1999–2011 however, with rates falling from 23.5% to 9.6% for students from schools in the most deprived areas, from 16.2% to 4.6% for schools in average areas, and from 11.8% to 1.9% for students from schools in the least deprived areas.

2009 New Zealand Tobacco Use Survey

The New Zealand Tobacco Use Surveys are part of the New Zealand Health Monitor, an integrated programme of household surveys managed by the Ministry of Health. There have been three comprehensive national tobacco use surveys conducted in New Zealand: in 2006, 2008 and 2009. This section reviews tobacco use in Māori young people aged 15–19 years using data from the 2009 New Zealand Tobacco Use Survey [109].

Data Source and Methods

Definition

1. The proportion of young people aged 15–19 years who were current smokers

Data Source

2009 New Zealand Tobacco Use Survey (NZTUS)

Numerator

Number of young people who were current smokers (current is defined as someone who has smoked more than 100 cigarettes in their lifetime and at the time of the survey was smoking at least once a month)

Denominator

Number of young people surveyed

Notes on Interpretation

The target population for the 2009 NZTUS was the usually resident population aged 15–64 years living in private dwellings in New Zealand. A multi-stage, stratified, probability-proportional-to-size sampling design was used. The design included a Pacific stratum, as well as sampling by District Health Board area and a screen sample to boost the proportions of Māori, Pacific people and those aged 15–24 years.

Participation in the 2009 NZTUS was voluntary, with the survey being carried out by trained interviewers from January to May 2009 using a face-to-face computer-assisted personal interview system. A total sample size of 5222 people aged 15–64 years was achieved, with a weighted response rate of 71.3%. The total sample included 980 Māori, 522 Pacific people, 560 Asian people and 3202 European/Other people. The survey data were weighted so that estimates of population totals, averages and proportions were representative of the total resident population of New Zealand [109].

In the 2009 NZTUS ethnicity was self-defined with participants being able to report affiliation with multiple ethnicities, using the Statistics NZ's standard ethnicity question. Ethnicity was then outputted into four "total response" ethnic groups: European/Other, Māori, Pacific, Asian. The 'Other' ethnic group (comprising mainly Middle-Eastern, Latin-American and African ethnicities) was combined with 'European' to avoid small number problems. Because participants could be counted in one or more of the four ethnic groups, direct comparisons between ethnic groups are not possible, with all rate ratios being calculated by comparing each ethnic group to the total population [109].

Distribution by Gender and Ethnicity

In the 2009 NZ Tobacco Use Survey, while current smoking rates for Māori females aged 15–19 years (47.1% 95% CI 33.4–60.7) were higher than for Māori males (29.2% 95% CI 16.7–44.5) differences between Māori females and males did not reach statistical significance. Current smoking rates for Māori young people (RR 2.15 95% CI 1.62–2.67) however, were *significantly* higher than for New Zealand young people as a whole, with rates for young Māori females also being *significantly* higher than for young NZ females (differences between young Māori males and young NZ males were not statistically significant, although rates for young Māori males were higher than the NZ male total) (Table 28).

Table 28. Proportion of Young People Aged 15–19 Years who were Current Smokers by Gender and Ethnicity, 2009 NZ Tobacco Use Survey

Current Smoking in Young People Aged 15–19 Years				
Gender	Unadjusted Prevalence per 100 (95% CI)			Rate Ratio
	Māori	European/Other	New Zealand Total	Māori vs. NZ Total
Males	29.2 (16.7–44.5)	17.4 (11.3–23.4)	16.9 (12.0–21.9)	1.72 (1.00–2.45)
Females	47.1 (33.4–60.7)	16.4 (10.7–22.2)	19.1 (14.5–23.8)	2.46 (1.70–3.21)
Total	38.2 (28.8–47.5)	16.9 (13.0–20.8)	18.0 (14.9–21.2)	2.15 (1.62–2.67)

Source: 2009 New Zealand Tobacco Use Survey [109]; Note: Ethnicity is Total Response

New Zealand Distribution

Distribution by Age and Gender

In the 2009 NZ Tobacco Use Survey, while the proportion of females (19.1% at 15–19 years and 31.2% at 20–24 years) who were current smokers was higher than for males (16.9% at 15–19 years and 30.1% at 20–24 years), in neither case did these differences reach statistical significance. The proportion of young people aged 20–24 years (30.7%) who were current smokers however, was *significantly* higher than for those aged 15–19 years (18.0%).

Distribution by Gender and NZ Deprivation Index Decile

In the 2009 NZ Tobacco Use Survey, while current smoking rates for females aged 15–19 years in some NZDep06 deciles were higher than for males, in no cases did these differences reach statistical significance. Current smoking rates for young people from the most deprived (NZDep deciles 9–10) areas (30.9% 95% CI 22.6–39.3) however, were *significantly* higher than for those from the least deprived (NZDep deciles 1–2) areas (10.0% 95% CI 4.2–19.2).

Source of Tobacco in the Last Month

In the 2009 NZ Tobacco Use Survey, current smokers aged 15–19 years indicated that the most common way of sourcing tobacco in the past month was to buy it themselves (79.3% 95% CI 70.7–87.9), although other sources of tobacco were friends (27.6% 95% CI 18.9–36.2) or family (22.9% 95% CI 14.7–31.1).

Local Policy Documents and Evidence-Based Reviews Relevant to the Prevention or Cessation of Smoking in Young People

The Determinants of Health for Children and Young People in New Zealand [4] provides a brief overview of local policy documents and evidence-based reviews relevant to the prevention or cessation of smoking in young people.



ALCOHOL-RELATED HOSPITAL ADMISSIONS

Introduction

The following section explores alcohol-related hospital admissions in Māori young people aged 15–24 years.

Background

New Zealand does not have a legal drinking age, but it is illegal for people under the age of 18 years to purchase alcohol (lowered from 20 to 18 in 1999) [110]. However, research indicates that drinking alcohol is common under the age of 18, and young people were identified as a key at-risk population group in the National Drug Policy 2007–2012 [111].

In terms of prevalence, the Youth '07 survey of 9,107 secondary school students from across New Zealand found that 84.7% of Māori students reported having ever drunk alcohol, and 73.4% (compared to 66.2% NZ European students), were current drinkers (defined as those who noted they had drunk alcohol at some time and in a subsequent key indicator, did not respond “I don’t drink alcohol now”) [112,113]. Among current drinkers, Māori students were more likely to report binge drinking (usually consume five or more alcoholic drinks within a four hour session) than NZ European students (Māori, 69.8%; NZ European, 54.0%). A third (34.4%) of all Māori students also reported that within the previous month they had been a passenger in a car driven by someone who was potentially drunk (had consumed more than 2 drinks in the 2 hours prior to driving), with a variety of other harms associated with drinking also being reported, for example being injured, having unsafe sex, and “doing things that could have got you into serious trouble”.

Technical Note: 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. Further, because of regional inconsistencies in the uploading of emergency department (ED) cases to the National Minimum Dataset, all admissions with an ED specialty code on discharge have been excluded. While it is likely that such an approach will result in a significant undercount (due to regional variations in coding and the fact that many alcohol-related issues are dealt with in the ED setting), it is nevertheless hoped that it will serve to identify “the tip of the iceberg” in terms of the contribution alcohol makes to hospital admissions in Māori young people.

Data Source and Methods

Definition

1. *Alcohol-related hospital admissions in young people aged 15–24 years*

Data Source

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 (projected from 2007)

Notes on Interpretation

Note 1: It is likely that the figures presented reflect a significant undercount as a result of regional differences in the extent to which: 1) clinicians document alcohol as a contributory cause of admission; 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 [114]. 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 2: Due to inconsistent uploading of ED cases to the NMDS, all admissions with an ED specialty code on discharge have been excluded (see **Appendix 2** 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.

Table 29. Alcohol-Related Hospital Admissions in Māori Young People Aged 15–24 Years by Primary Diagnosis, New Zealand 2007–2011

Primary Diagnosis	Number: Total 2007–2011	Number: Annual Average	Rate per 100,000	% of Admissions
Māori Young People Aged 15–24 Years				
Mental and Behavioural Disorders				
Alcohol: Acute Intoxication	106	21.2	17.11	5.0
Alcohol: Dependence	24	4.8	3.87	1.1
Alcohol: Other Mental/Behavioural Disorders	52	10.4	8.39	2.4
Schizophrenia	259	51.8	41.81	12.2
Other Schizotypal and Delusional Disorders	158	31.6	25.50	7.4
Bipolar Affective Disorder	44	8.8	7.10	2.1
Depression/Other Mood Disorders	110	22.0	17.76	5.2
Reaction to Stress/Adjustment Disorder	69	13.8	11.14	3.2
Other Mental and Behavioural Disorders	101	20.2	16.30	4.7
Gastrointestinal System				
Gastritis/Upper Gastrointestinal Bleeding	41	8.2	6.62	1.9
Other Gastrointestinal Conditions	30	6.0	4.84	1.4
Injury and Poisoning				
Head Injury	261	52.2	42.13	12.3
Neck Injury	28	5.6	4.52	1.3
Shoulder/Upper Arm Injuries	41	8.2	6.62	1.9
Elbow/Forearm Injuries	117	23.4	18.89	5.5
Wrist/Hand Injuries	129	25.8	20.82	6.1
Lower Limb Injuries	101	20.2	16.30	4.7
Other Injuries	116	23.2	18.72	5.5
*Poisoning	148	29.6	23.89	7.0
Toxic Effect of Alcohol	28	5.6	4.52	1.3
All Other Diagnoses				
Other Diagnoses	165	33.0	26.63	7.8
Total Alcohol-Related Admissions	2,128	425.6	343.50	100.0

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population (projected from 2007); 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

Distribution by Primary Diagnosis

In New Zealand during 2007–2011, alcohol was listed as a contributory cause in a large number of hospital admissions in Māori young people. However only 6.3% of alcohol-related admissions had acute intoxication or the toxic effects of alcohol listed as the primary diagnosis. In 37.3% of cases, an injury was the primary diagnosis, with head and upper limb injuries playing a particularly prominent role. In addition, 38.4% of admissions had a mental health condition (including alcohol dependence) listed as the primary

diagnosis, with schizophrenia being the most frequent mental health diagnosis recorded. Finally 7.0% of alcohol-related admissions had poisoning by other drugs or substances listed as the primary reason for admission (**Table 29**). In interpreting these figures, it must be remembered that as a result of inconsistent uploading of emergency department (ED) cases to the National Minimum Dataset, ED cases have been removed. These figures thus 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.

Distribution by External Cause of Injury

In New Zealand during 2007–2011, 54.7% of alcohol-related hospital admissions in Māori young people had an external cause of injury (e-code) recorded. Of all alcohol-related admissions, 9.4% were associated with an assault and 8.6% with an episode of self-harm. A further 7.2% were for injuries sustained while the young person was the occupant of a car, with the majority occurring as the result of a car colliding with a stationary object, or overturning. Finally 6.5% were associated with a fall and 10.7% with inanimate mechanical forces (**Table 30**).

Table 30. Listed External Causes of Injury for Alcohol-Related Hospital Admissions in Māori Young People Aged 15–24 Years, New Zealand 2007–2011

Primary External Cause of Injury	Number: Total 2007– 2011	Number: Annual Average	Rate per 100,000	% of Admissions
Māori Young People Aged 15–24 Years				
Alcohol-Related Hospital Admissions				
Inanimate Mechanical Forces	228	45.6	36.80	10.7
Assault	200	40.0	32.28	9.4
Intentional Self-Harm	184	36.8	29.70	8.6
Falls	138	27.6	22.28	6.5
Transport: Car Occupant, Collide Stationery Object	68	13.6	10.98	3.2
Transport: Car Occupant, Overturning/Non-Collision	57	11.4	9.20	2.7
Transport: Car Occupant, Other	29	5.8	4.68	1.4
Transport: Pedestrian	26	5.2	4.20	1.2
Transport: Other Land Transport	17	3.4	2.74	0.8
Transport: Motorbike	16	3.2	2.58	0.8
Transport: Cyclist	5	1.0	0.81	0.2
Undetermined Intent	50	10.0	8.07	2.3
Accidental Poisoning: Alcohol	17	3.4	2.74	0.8
Accidental Poisoning: Other Substances	20	4.0	3.23	0.9
Other External Causes	109	21.8	17.59	5.1
No External Cause Listed	964	192.8	155.61	45.3
Total Alcohol-Related Admissions	2,128	425.6	343.50	100.0

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population (projected from 2007); 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

Distribution by Ethnicity

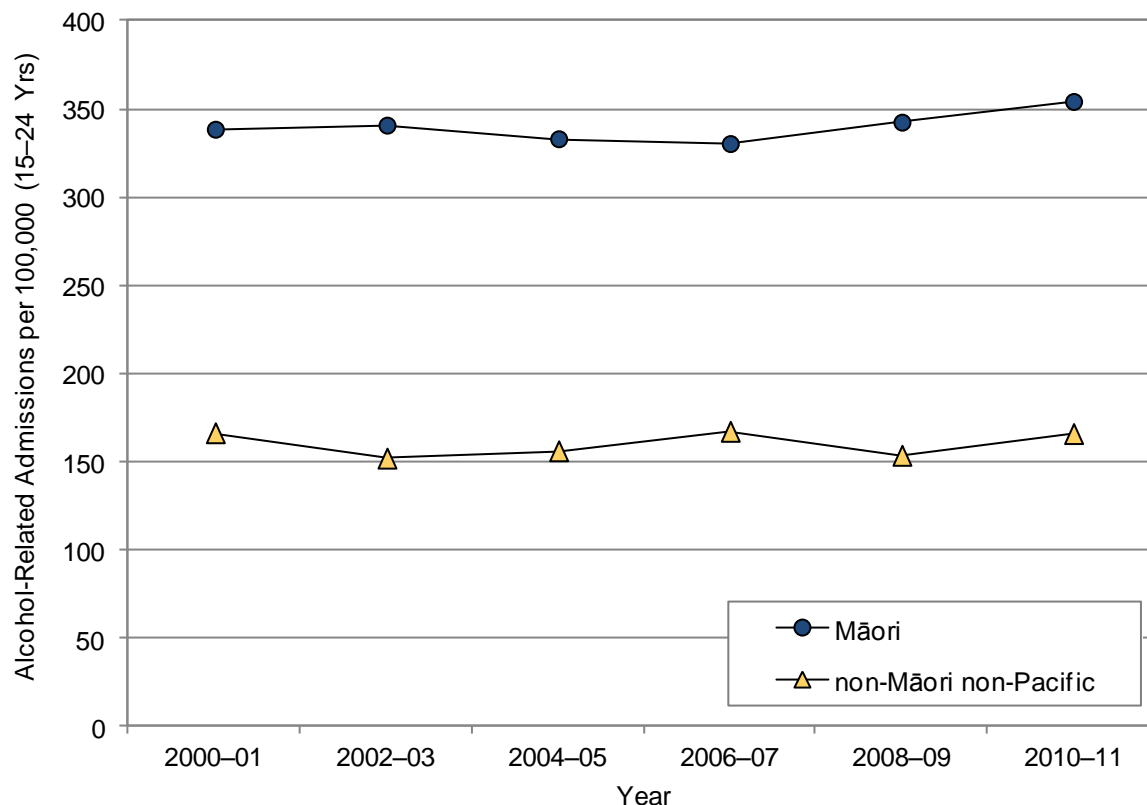
In New Zealand during 2007–2011, alcohol-related hospital admissions were *significantly* higher for Māori young people than for non-Māori non-Pacific young people (**Table 31**). Similar ethnic differences were seen during 2000–2011, with admissions for Māori young people being relatively static during the early to mid-2000s, but increasing gradually after 2006–07 (**Figure 46**).

Table 31. Alcohol-Related Hospital Admissions in Young People Aged 15–24 Years by Ethnicity, New Zealand 2007–2011

Variable	Rate	Rate Ratio	95% CI
Alcohol-Related Hospital Admissions			
Māori	343.5	2.11	2.00–2.23
non-Māori non-Pacific	162.7	1.00	

Source: Numerator National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: Rates are per 100,000; Rate Ratios are unadjusted; Admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; Emergency Department cases removed

Figure 46. Alcohol-Related Hospital Admissions in Young People Aged 15–24 Years by Ethnicity, New Zealand 2000–2011

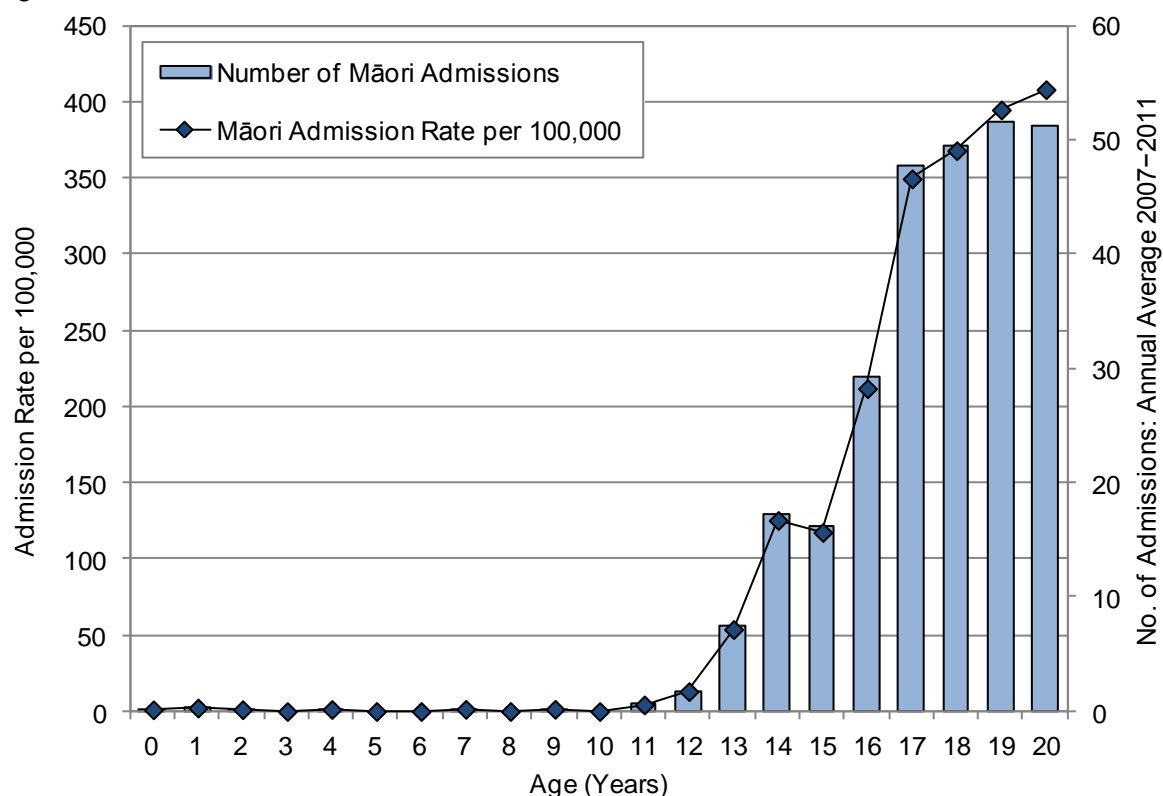


Source: Numerator National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; Emergency Department cases removed

Distribution by Age

In New Zealand during 2007–2011, alcohol-related hospital admissions were infrequent in Māori children, but rose rapidly after 12 years of age, with the highest rates being seen amongst those in their late teens (**Figure 47**).

Figure 47. Alcohol-Related Hospital Admissions in Māori Children and Young People by Age, New Zealand 2007–2011



Source: Numerator National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population (projected from 2007); 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

The Determinants of Health for Children and Young People in New Zealand [4] provides a brief 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.



HEALTH OUTCOMES AS DETERMINANTS



SOCIOECONOMICALLY SENSITIVE HOSPITAL ADMISSIONS AND MORTALITY

HOSPITAL ADMISSIONS AND MORTALITY WITH A SOCIAL GRADIENT IN CHILDREN

Introduction

The following section uses the National Minimum Dataset and Mortality Collection to review hospital admissions and mortality from a basket of socioeconomically sensitive conditions in Māori children aged 0–14 years.

Background

In New Zealand, many child health outcomes exhibit a social gradient, with hospital admissions and mortality from socioeconomically sensitive conditions being several times higher for Māori than for European children [5]. These disparities were present even in the mid 2000s when New Zealand experienced some of its lowest unemployment rates in recent decades. The macroeconomic environment began to change in 2008, however, with the country officially entering a recession at the end of June 2008 after two consecutive quarters of negative growth. While New Zealand technically left the recession at the end of June 2009, growth since then has been variable, with unemployment rates and the number of children reliant on benefit recipients remaining higher than in the mid-2000s.

The effects of these economic changes on socially sensitive health outcomes for Māori children remain unclear. Research suggests that the impacts may vary, not only with the magnitude and duration of any economic downturn, but also as a result of the Government's social policy responses and the extent to which it maintains an effective social safety net for those most affected. Further, the adaptations families make to their economic circumstances (e.g. cutting back on heating and doctor's visits vs. reductions in cigarettes and takeaways) are also important, with the net impact of such positive/negative adaptations on health outcomes for children being difficult to predict. For a more detailed review see Craig 2009 [115].



Data Source and Methods

Definition

1. Hospital admissions for medical conditions with a social gradient in children aged 0–14 years
2. Hospital admissions for injuries with a social gradient in children aged 0–14 years
3. Mortality from conditions with a social gradient 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 <29 days excluded) with the following ICD-10-AM primary diagnoses: A00–A09, R11, K52.9 (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 (Viral Pneumonia); J13–J16 or J18 (Bacterial/Non-Viral Pneumonia); J21 (Acute Bronchiolitis); J45–J46 (Asthma); J47 (Bronchiectasis); G00–G01 (Bacterial Meningitis); A87, G02 or G03 (Viral/Other/NOS Meningitis); G40 or G41 (Epilepsy/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 <29 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 (Electricity/Fire/Burns); X40–X49 (Accidental 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 <29 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 29 days and 1 year and their main underlying cause of death was SUDI (ICD-10-AM R95, R96, R98, R99, W75).

Denominator:

Children aged 0–14 years: NZ Statistics NZ Estimated Resident Population (projected from 2007)

Notes on Interpretation

Note 1: Because of the cancellation of the 2011 Census and concerns about extrapolating Census derived population estimate denominators beyond five years, in this section Statistics NZ population projections have been used to calculate rates from 2007 onwards. Because these projections are only available for a limited range of ethnic groups (Māori, Pacific and non-Māori non-Pacific) and are unavailable for NZDep, the analyses in this section are more limited than in previous years.

Note 2: Hospital admissions in neonates (<29 days) were excluded from both indicators. 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), through special care nurseries (SCBU) to the postnatal ward) and respiratory infections and/or other medical conditions arising in these contexts are likely to differ in their aetiology from those arising in the community.

Note 3: For medical conditions, only acute and arranged admissions have been included, as waiting list admissions tend to reflect service capacity rather than actual health need (e.g. inclusion of these admissions would result in a large number of children with otitis media with effusion (OME) and chronic tonsillitis being included (for grommets and tonsillectomies), whose demographic profile is very different from children attending hospital acutely for similar diseases). For injury admissions however, filtering by admission type was not undertaken, with all injury cases with an Emergency Department Specialty Code (M05–M08) on discharge being excluded (see **Appendix 2** for rationale).

Note 4: Hospital admissions were considered to have a social gradient if rates for those in the most deprived (NZDep deciles 9–10) areas were ≥ 1.8 times higher than for those in the least deprived (NZDep deciles 1–2) areas, 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 5: When considering the magnitude of social gradients between medical and injury admissions it must be remembered that these differences are not strictly comparable, as for technical reasons, emergency department cases have been removed from injury admissions (and social differences in attendance at the Emergency Department vs. primary care for minor medical conditions may have accounted for some (but not all) 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 6: SUDI rates are traditionally calculated per 1,000 live births. For this analysis rates for those aged 0–14 years have been calculated, 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 details of the methodology used to derive these indicators see **Appendix 8**

Hospital Admissions

Distribution by Cause

In New Zealand during 2007–2011, bronchiolitis, asthma and skin infections made the largest individual contributions to hospitalisations for medical conditions with a social gradient in Māori children, although infectious and respiratory diseases collectively were responsible for the majority of admissions. Falls, followed by inanimate mechanical forces were the leading causes of injury admissions with a social gradient (**Table 32**).

Distribution by Ethnicity

In New Zealand during 2007–2011, hospital admissions for medical conditions and injuries with a social gradient were both *significantly* higher for Māori than for non-Māori non-Pacific children. While the magnitude of these differences appeared smaller for injury admissions, it must be remembered that that for technical reasons (See Note 5 in Methods Section) these categories are not strictly comparable (**Table 33**).

Table 32. Hospital Admissions for Conditions with a Social Gradient in Māori Children Aged 0–14 Years (Excluding Neonates) by Primary Diagnosis, New Zealand 2007–2011

Primary Diagnosis	Māori Children 0–14 Years			
	Number: Total 2007–2011	Number: Annual Average	Rate per 1,000	% of Total
Medical Conditions				
Bronchiolitis	12,570	2,514.0	11.10	21.6
Asthma	8,708	1,741.6	7.69	14.9
Skin Infections	6,146	1,229.2	5.43	10.6
Gastroenteritis	5,569	1,113.8	4.92	9.6
Acute Upper Respiratory Infections Excl Croup	5,508	1,101.6	4.86	9.5
Viral Infection of Unspecified Site	4,613	922.6	4.07	7.9
Bacterial/Non-Viral Pneumonia	4,467	893.4	3.94	7.7
Urinary Tract Infection	1,533	306.6	1.35	2.6
Dermatitis and Eczema	1,458	291.6	1.29	2.5
Croup/Laryngitis/Tracheitis/Epiglottitis	1,444	288.8	1.28	2.5
Epilepsy/Status Epilepticus	1,144	228.8	1.01	2.0
Otitis Media	1,043	208.6	0.92	1.8
Febrile Convulsions	967	193.4	0.85	1.7
Viral Pneumonia	595	119.0	0.53	1.0
Rheumatic Fever/Heart Disease	505	101.0	0.45	0.9
Inguinal Hernia	455	91.0	0.40	0.8
Bronchiectasis	358	71.6	0.32	0.6
Osteomyelitis	340	68.0	0.30	0.6
Viral/Other/NOS Meningitis	233	46.6	0.21	0.4
Meningococcal Disease	220	44.0	0.19	0.4
Vaccine Preventable Diseases	179	35.8	0.16	0.3
Bacterial Meningitis	103	20.6	0.09	0.2
Nutritional Deficiencies/Anaemias	76	15.2	0.07	0.1
Tuberculosis	14	2.8	0.01	<0.1
Total	58,248	11,649.6	51.44	100.0
Injury Admissions				
Falls	6,249	1,249.8	5.52	46.6
Mechanical Forces: Inanimate	3,362	672.4	2.97	25.1
Mechanical Forces: Animate	875	175.0	0.77	6.5
Electricity/Fire/Burns	727	145.4	0.64	5.4
Transport: Cyclist	689	137.8	0.61	5.1
Accidental Poisoning	665	133.0	0.59	5.0
Transport: Vehicle Occupant	421	84.2	0.37	3.1
Transport: Pedestrian	358	71.6	0.32	2.7
Drowning/Submersion	61	12.2	0.05	0.5
Total	13,407	2,681.4	11.84	100.0

Source: Numerator: National Minimum Dataset (neonates removed); Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: *Medical Conditions*: Acute and arranged admissions only; *Injury Admissions*: Emergency Department cases removed

Table 33. Distribution of Hospital Admissions with a Social Gradient in Children Aged 0–14 Years (Excluding Neonates) by Ethnicity, New Zealand 2007–2011

Ethnicity	Rate	Rate Ratio	95% CI
Hospital Admissions for Medical Conditions			
Māori	51.44	1.67	1.65–1.69
non-Māori non-Pacific	30.81	1.00	
Hospital Admissions for Injuries			
Māori	11.84	1.17	1.14–1.19
non-Māori non-Pacific	10.16	1.00	

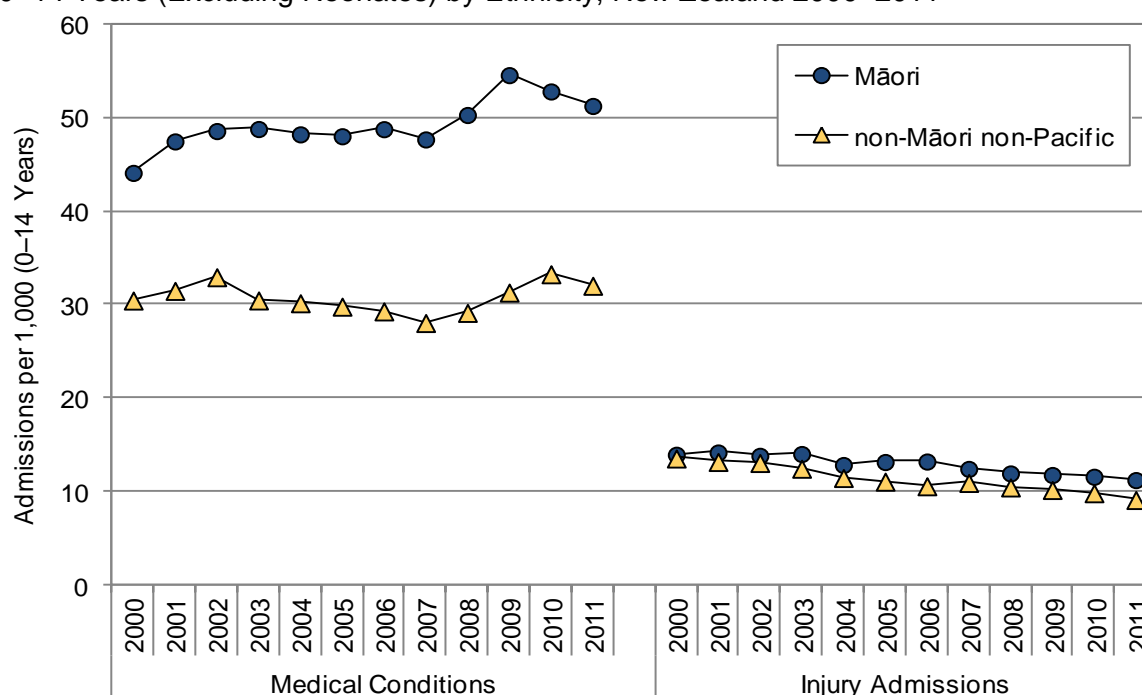
Source: Numerator: National Minimum Dataset (neonates removed); Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: *Medical Conditions*: Acute and arranged admissions only; *Injuries*: Emergency Department cases removed; Rates are per 1,000; Rate Ratios are unadjusted

Trends by Ethnicity

Medical Conditions: In New Zealand during 2000–2011, hospitalisations for medical conditions with a social gradient were consistently higher for Māori than for non-Māori non-Pacific children. Rates for Māori children were relatively static during the mid 2000s, but increased between 2007 and 2009, before declining again during 2010–2011. Rates for non-Māori non-Pacific children declined during the mid-2000s, but increased again between 2007 and 2010 (**Figure 48**).

Methodological Note: In July 2009, the Ministry made it mandatory for DHBs to report Emergency Department (ED) cases with more than three hours treatment time to the National Minimum Dataset. While most DHBs were consistently reporting their ED cases prior to this time, or did not appear to change their practice, in a small number of DHBs there was an abrupt increase in ED cases from 2009. In most cases, the number of additional cases was relatively modest, however the staggered increase in reporting resulted in a gradual increase in admissions from 2009 (see **Appendix 2** for a more detailed discussion of this issue). Thus a proportion of the increases seen in medical admissions may have been due to these changes.

Figure 48. Hospital Admissions for Conditions with a Social Gradient in Children Aged 0–14 Years (Excluding Neonates) by Ethnicity, New Zealand 2000–2011



Source: Numerator: National Minimum Dataset (neonates removed); Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: *Medical Conditions*: Acute and arranged admissions only; *Injury Admissions*: Emergency Department cases removed; Note: See **Appendix 2** for cautions regarding interpretation of trends

Injuries: In New Zealand during 2000–2011, injury admissions with a social gradient were also higher for Māori children than for non-Māori non-Pacific children. While admission rates declined for both ethnic groups during 2000–2011, the rate of decline was faster for non-Māori non-Pacific children than for Māori children. Thus ethnic differences were greater in 2011 than they were in 2000. While in absolute terms, the magnitude the ethnic differences seen appeared to be less marked than for medical conditions, for technical reasons, comparisons between these categories is not strictly possible (see Note 5 in Methods section) (**Figure 48**).

Distribution by Ethnicity and District Health Board

Medical Conditions: In New Zealand during 2007–2011, hospital admissions for medical conditions with a social gradient were *significantly* higher for Māori children than for non-Māori non-Pacific children in all DHBs except the West Coast, although the magnitude of these differences varied considerably from DHB to DHB (**Table 34**).

Table 34. Hospital Admissions for Medical Conditions with a Social Gradient in Children Aged 0–14 Years (excluding Neonates) by Ethnicity and District Health Board, New Zealand 2007–2011

District Health Board	Total Māori Admissions 2007–2011	Māori Admissions: Annual Average	Māori Admission Rate per 1,000	non-Māori non-Pacific Admission Rate per 1,000	Rate Ratio	95% CI
Hospital Admissions for Medical Conditions						
Northland	4,902	980.4	57.5	29.8	1.93	1.84–2.02
Waitemata	5,284	1,056.8	58.0	30.8	1.88	1.83–1.94
Auckland	3,118	623.6	60.1	35.6	1.69	1.62–1.75
Counties Manukau	8,206	1,641.2	54.1	28.0	1.93	1.87–1.99
Waikato	5,687	1,137.4	42.0	25.2	1.67	1.61–1.73
Lakes	3,773	754.6	63.0	37.7	1.67	1.59–1.76
Bay of Plenty	5,677	1,135.4	63.3	44.0	1.44	1.39–1.49
Tairāwhiti	2,320	464.0	63.4	37.2	1.70	1.57–1.84
Taranaki	1,329	265.8	41.3	25.6	1.62	1.51–1.73
Hawke's Bay	3,738	747.6	56.0	27.0	2.07	1.97–2.18
MidCentral	2,075	415.0	38.1	31.8	1.20	1.14–1.26
Whanganui	1,975	395.0	72.7	47.1	1.54	1.45–1.64
Hutt Valley	2,640	528.0	61.6	41.3	1.49	1.42–1.57
Capital and Coast	2,053	410.6	41.3	28.5	1.45	1.38–1.52
Wairarapa	559	111.8	50.5	29.3	1.72	1.55–1.92
Nelson Marlborough	670	134.0	31.8	24.3	1.31	1.20–1.42
South Canterbury	166	33.2	25.5	21.3	1.19	1.01–1.41
Canterbury	2,211	442.2	31.7	30.1	1.05	1.01–1.10
West Coast	153	30.6	27.9	24.1	1.16	0.97–1.38
*Otago	614	122.8	28.2	23.1	1.22	1.12–1.33
*Southland	982	196.4	44.0	36.4	1.21	1.13–1.30

Source: Numerator: National Minimum Dataset (Acute and arranged admissions only, neonates removed); Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: Rate Ratio compares rates for Māori and non-Māori non-Pacific children; *Southern DHB

Injuries: In New Zealand during 2007–2011, hospital admissions for injuries with a social gradient were *significantly* higher for Māori children than for non-Māori non-Pacific children in the Northland, Waitemata, Auckland, Counties Manukau, Waikato, Lakes, Bay of Plenty, Hawke's Bay, and Hutt Valley DHBs. Rates for Māori children in the Taranaki, MidCentral, Canterbury and Southland DHBs were *significantly* lower than for non-Māori non-Pacific children, while admissions for Māori children in the remaining eight DHBs were similar to those of non-Māori non-Pacific children (**Table 35**).

Table 35. Hospital Admissions for Injuries with a Social Gradient in Children 0–14 Years (excluding Neonates) by Ethnicity and District Health Board, New Zealand 2007–2011

District Health Board	Total Māori Admissions 2007–2011	Māori Admissions: Annual Average	Māori Admission Rate per 1,000	non-Māori non-Pacific Admission Rate per 1,000	Rate Ratio	95% CI
Hospital Admissions for Injuries with a Social Gradient						
Northland	1,179	235.8	13.8	10.6	1.30	1.19–1.42
Waitemata	1,024	204.8	11.2	9.7	1.16	1.09–1.24
Auckland	622	124.4	12.0	8.6	1.39	1.27–1.52
Counties Manukau	2,001	400.2	13.2	10.0	1.32	1.25–1.40
Waikato	1,395	279.0	10.3	8.9	1.15	1.08–1.23
Lakes	741	148.2	12.4	10.3	1.21	1.08–1.35
Bay of Plenty	1,264	252.8	14.1	11.9	1.19	1.10–1.28
Tairāwhiti	550	110.0	15.0	15.5	0.97	0.84–1.11
Taranaki	256	51.2	8.0	9.2	0.86	0.75–0.99
Hawke's Bay	999	199.8	15.0	11.3	1.33	1.22–1.45
MidCentral	466	93.2	8.6	9.6	0.89	0.80–0.99
Whanganui	358	71.6	13.2	12.6	1.05	0.91–1.20
Hutt Valley	549	109.8	12.8	10.8	1.19	1.07–1.31
Capital and Coast	514	102.8	10.3	9.4	1.10	1.00–1.21
Wairarapa	131	26.2	11.8	13.2	0.90	0.74–1.09
Nelson Marlborough	188	37.6	8.9	9.8	0.91	0.78–1.06
South Canterbury	65	13.0	10.0	11.4	0.88	0.68–1.14
Canterbury	658	131.6	9.4	11.0	0.86	0.79–0.93
West Coast	65	13.0	11.9	10.9	1.08	0.83–1.42
*Otago	162	32.4	7.4	8.7	0.85	0.72–1.00
*Southland	191	38.2	8.6	10.7	0.80	0.69–0.94

Source: Numerator: National Minimum Dataset (Emergency Department cases and neonates removed); Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: Rate Ratio compares rates for Māori and non-Māori non-Pacific children; *Southern DHB

Mortality

Distribution by Cause

In New Zealand during 2005–2009, SUDI made the single largest contribution to mortality with a social gradient in Māori 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-related deaths made the largest contribution to injury-related deaths, followed by pedestrian injuries and drowning, while bacterial/non-viral pneumonia was the leading cause of mortality from medical conditions (**Table 36**).

Distribution by Ethnicity

In New Zealand during 2005–2009, mortality from medical conditions and injuries with a social gradient were both *significantly* higher for Māori children than for non-Māori non-Pacific children (**Table 37**). Differences in SUDI mortality are considered in the Infant Mortality section.

Table 36. Mortality from Conditions with a Social Gradient in Māori Children 0–14 Years (Excluding Neonates) by Main Underlying Cause of Death, New Zealand 2005–2009

Cause of Death	Number: Total 2005–2009	Number: Annual Average	Rate per 100,000	Percent of Category
Māori Children 0–14 Years				
Medical Conditions				
Bacterial/Non-Viral Pneumonia	21	4.2	1.91	31.3
Meningococcal Disease	8	1.6	0.73	11.9
Viral Pneumonia	7	1.4	0.64	10.4
Epilepsy/Status Epilepticus	7	1.4	0.64	10.4
Gastroenteritis	6	1.2	0.55	9.0
Asthma	5	1.0	0.46	7.5
Acute Bronchiolitis	3	0.6	0.27	4.5
Other Causes	10	2.0	0.91	14.9
Total Medical Conditions	67	13.4	6.10	100.0
Injuries				
Transport: Vehicle Occupant	44	8.8	4.00	39.6
Transport: Pedestrian	22	4.4	2.00	19.8
Drowning/Submersion	18	3.6	1.64	16.2
Electricity/Fire/Burns	6	1.2	0.55	5.4
Accidental Poisoning	6	1.2	0.55	5.4
Mechanical Forces: Inanimate	5	1.0	0.46	4.5
Transport: Cyclist	5	1.0	0.46	4.5
Falls	5	1.0	0.46	4.5
Total Injuries	111	22.2	10.10	100.0
Post Neonatal SUDI				
SUDI (Infant)	166	33.2	15.11	100.0
Total Mortality	344	68.8	31.31	100.0

Source: Numerator: National Mortality Collection (neonates removed); Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: SUDI death numerators include infants 29–364 days only

Table 37. Distribution of Mortality with a Social Gradient in Children Aged 0–14 Years by Ethnicity, New Zealand 2005–2009

Ethnicity	Rate	Rate Ratio	95% CI
Mortality from Medical Conditions			
Māori	6.10	3.96	2.71–5.78
non-Māori non-Pacific	1.54	1.00	
Mortality from Injuries			
Māori	10.10	2.68	2.06–3.49
non-Māori non-Pacific	3.76	1.00	

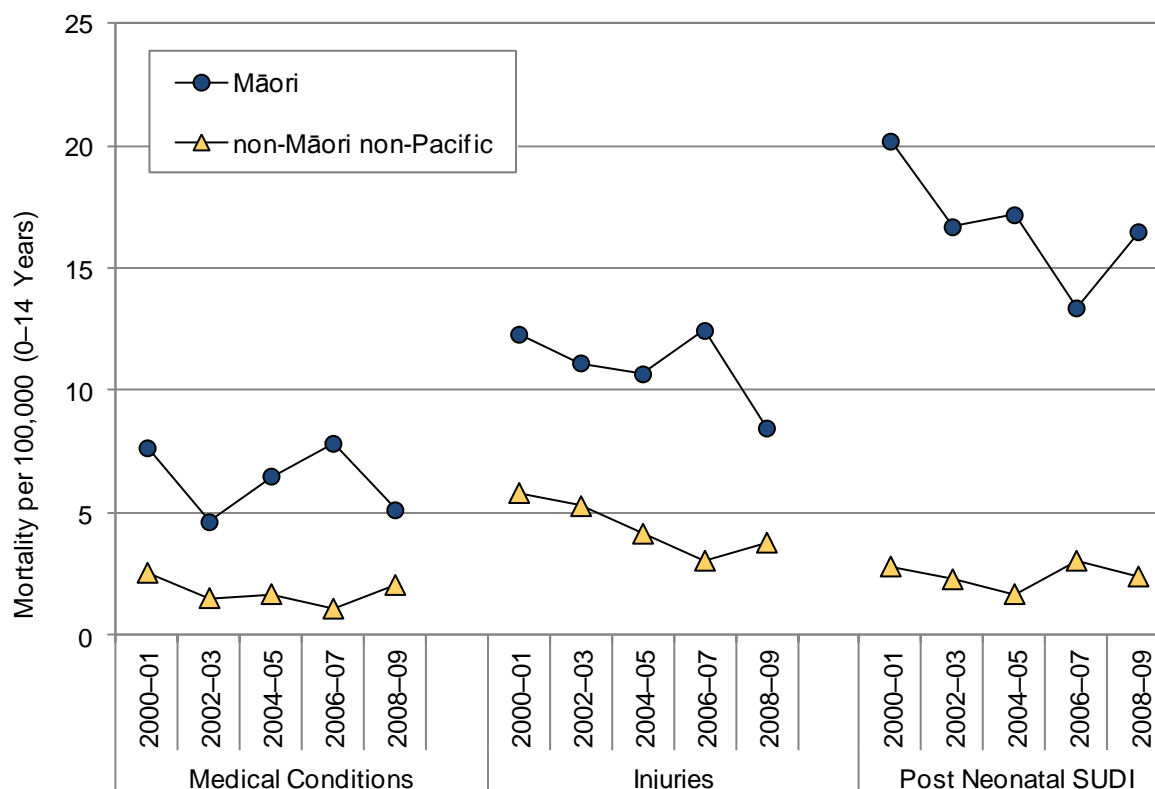
Source: Numerator: National Mortality Collection (neonates removed); Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: Rates are per 100,000; Rate Ratios are unadjusted



Trends by Ethnicity

In New Zealand during 2000–2009, mortality from medical conditions and injuries with a social gradient were both consistently higher for Māori children than for non-Māori non-Pacific children, as was post-neonatal mortality from SUDI (**Figure 49**)

Figure 49. Mortality from Conditions with a Social Gradient in Children Aged 0–14 Years (Excluding Neonates) by Ethnicity, New Zealand 2000–2009



Source: Numerator: National Mortality Collection (neonates removed); Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: SUDI deaths are for infants aged 29–364 days only

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, reductions in exposure to second-hand cigarette smoke, immunisation) will be required, if reductions in admissions and mortality are to be achieved. The Determinants of Health for Children and Young People in New Zealand [4] thus provides a brief overview of local policy documents and evidence-based reviews which consider policies to address the social determinants of health, the relationship between housing and health, the prevention of second-hand cigarette exposure in children, the cessation of smoking in pregnancy and immunisation.

INFANT MORTALITY AND SUDDEN UNEXPECTED DEATH IN INFANCY

Introduction

The following section uses information from the National Mortality Collection to review neonatal, post neonatal and total infant mortality in Māori infants since 1996.

Background

Infant mortality is often used as a barometer of the social wellbeing of a country [116]. In New Zealand, both neonatal and post neonatal mortality are higher for Māori than for European infants, with neonatal mortality during 2002–2006 being 1.22 (95% CI 1.06–1.42) times higher for Māori than for European infants, and post-neonatal mortality being 3.03 (95% CI 2.52–3.63) times higher. When broken down by cause however, the greatest disparities are seen for Sudden Unexpected Death in Infancy (SUDI), with rates for Māori babies being 5.74 (95% CI 4.32–7.63) times higher than for European babies during 2002–2006 [115].

In attempting to understand the reasons for these disparities, a recent review of Sudden Infant Death Syndrome (SIDS) related knowledge and infant care practices among Māori mothers in South Auckland found that knowledge about SIDS prevention was much lower amongst Māori than European mothers, with more Māori infants sleeping prone and having stopped breastfeeding earlier. Although co-sleeping rates were similar, bed sharing increased to 65% for some part of the night, with more than half of Māori mothers smoking in pregnancy, 21% sharing a bed with their infant, and potentially unsafe soft objects (e.g. rolled blankets or pillows) being used by a third to help maintain sleep position. Tipene-Leach et al. concluded that appropriate health promotion measures needed to be developed which were of relevance to Māori whānau [117].

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 28 days of life*
3. *Post Neonatal Mortality: Death of a live born infant after 28 days but prior to 365 days of life*
4. *Sudden Unexpected Death in Infancy (SUDI): 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 or Ill-Defined/Unspecified Causes*

Data Sources

Numerator: National Mortality Collection: All deaths in the first year of life, using the definitions for total infant, neonatal and post neonatal mortality outlined above. Cause of death is 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 (Q00–Q99); Intrauterine/Birth Asphyxia (P20–P21); Extreme Prematurity (P07.2); Other Perinatal Conditions (P00–P96); SUDI: SIDS (R95); SUDI: Unspecified (R96, R98, R99); SUDI: Suffocation/Strangulation in Bed (W75); Injury/Poisoning (V01–Y36).

Denominator: Birth Registration Dataset (Live Births Only)

Notes on Interpretation

SIDS and SUDI: 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, that remains unexplained after a thorough investigation, including performance of a complete autopsy and review of the circumstances of death and the clinical history” [118].

In New Zealand, while SIDS rates have declined, large ethnic differences remain with SIDS being 6 fold higher for Māori than for European infants [5]. In addition, new issues with the definition of SIDS have emerged, 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. infant co-sleeping with parental alcohol consumption [119]). 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”. In turn, this has led to the adoption of the term Sudden Unexpected Death in Infancy (SUDI), to try to provide some consistency for measuring trends in the face of probable diagnostic transfer [119].

Total Infant, Neonatal and Post Neonatal Mortality

Distribution by Cause

In New Zealand during 2005–2009, extreme prematurity was the leading cause of neonatal mortality in Māori infants, although congenital anomalies, other perinatal conditions and SUDI also made a contribution. SUDI was the leading cause of post neonatal mortality, followed by congenital anomalies and other perinatal conditions (**Table 38**).

Table 38. Neonatal and Post Neonatal Mortality by Cause of Death in Māori Infants, New Zealand 2005–2009

Cause of Death	Number: Total 2005–2009	Number: Annual Average	Rate per 100,000	Percent of Deaths
Māori Infants				
Neonatal Mortality				
Extreme Prematurity	100	20.0	108.46	31.7
Congenital Anomalies: CVS	15	3.0	16.27	4.8
Congenital Anomalies: CNS	9	1.8	9.76	2.9
Congenital Anomalies: Other	41	8.2	44.47	13.0
Intrauterine/Birth Asphyxia	15	3.0	16.27	4.8
Other Perinatal Conditions	92	18.4	99.78	29.2
SUDI: Suffocation/Strangulation in Bed	16	3.2	17.35	5.1
SUDI: SIDS/Unspecified	13	2.6	14.10	4.1
Injury/Poisoning	3	0.6	3.25	1.0
Other Causes	11	2.2	11.93	3.5
Total Neonatal Mortality	315	63.0	341.65	100.0
Post Neonatal Mortality				
SUDI: SIDS	98	19.6	106.29	30.0
SUDI: Suffocation/Strangulation in Bed	62	12.4	67.25	19.0
SUDI: Unspecified	6	1.2	6.51	1.8
Congenital Anomalies: CVS	16	3.2	17.35	4.9
Congenital Anomalies: CNS	3	0.6	3.25	0.9
Congenital Anomalies: Other	12	2.4	13.02	3.7
Other Perinatal Conditions	32	6.4	34.71	9.8
Injury/Poisoning	14	2.8	15.19	4.3
Other Causes	84	16.8	91.11	25.7
Total Post Neonatal Mortality	327	65.4	354.67	100.0
Total Infant Mortality	642	128.4	696.32	100.0

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Note: CVS = Cardiovascular system; CNS = Central Nervous System

Distribution by Ethnicity

In New Zealand during 2005–2009, neonatal and post-neonatal mortality were both *significantly* higher for Māori infants than for non-Māori non-Pacific infants. On average during this period, 63 Māori infants each year died in the neonatal period while 65 died in the post neonatal period (**Table 39**).

Table 39. Distribution of Neonatal and Post Neonatal Mortality by Ethnicity, New Zealand 2005–2009

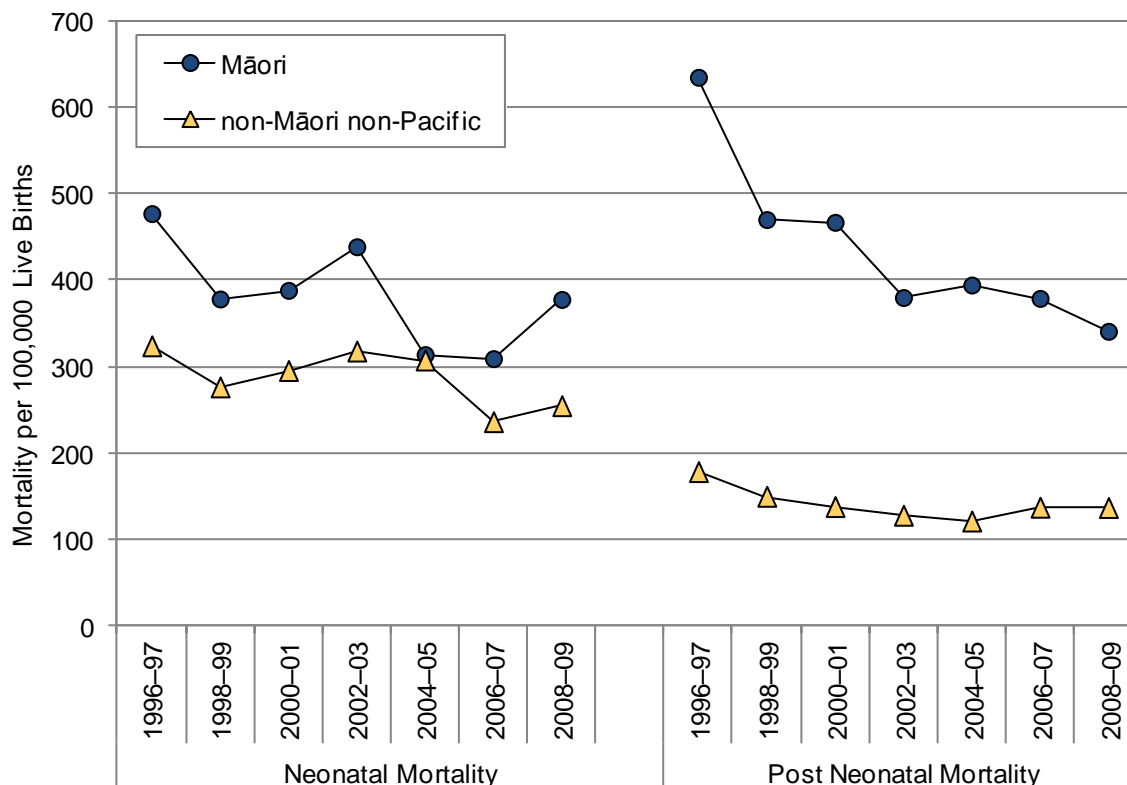
Ethnicity	Number: Total 2005–2009	Number: Annual Average	Rate per 100,000	Rate Ratio	95% CI
Neonatal Mortality					
Māori	315	63.0	341.7	1.36	1.18–1.57
non-Māori non-Pacific	468	93.6	250.9	1.00	
Post Neonatal Mortality					
Māori	327	65.4	354.7	2.70	2.29–3.19
non-Māori non-Pacific	245	49.0	131.3	1.00	

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Note: Rates are per 100,000 live births; Rate Ratios are unadjusted.

Trends by Ethnicity

In New Zealand during 1996–2009, neonatal and post neonatal mortality were consistently higher for Māori than for non-Māori non-Pacific infants. Rates for both outcomes exhibited a general downward trend, although a small upswing in neonatal mortality was evident during 2008–09 (however it is too soon to determine whether this is a one-off fluctuation, or the beginning of an upward trend) (**Figure 50**).

Figure 50. Neonatal and Post Neonatal Mortality by Ethnicity, New Zealand 1996–2009



Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset

Sudden Unexpected Death in Infancy

Distribution by Ethnicity

In New Zealand during 2005–2009, mortality from SUDI was *significantly* higher for Māori infants than for non-Māori non-Pacific infants. On average during this period, 39 Māori infants each year died as the result of SUDI (**Table 40, Figure 51**).

Table 40. Distribution of Sudden Unexpected Death in Infancy by Ethnicity, New Zealand 2005–2009

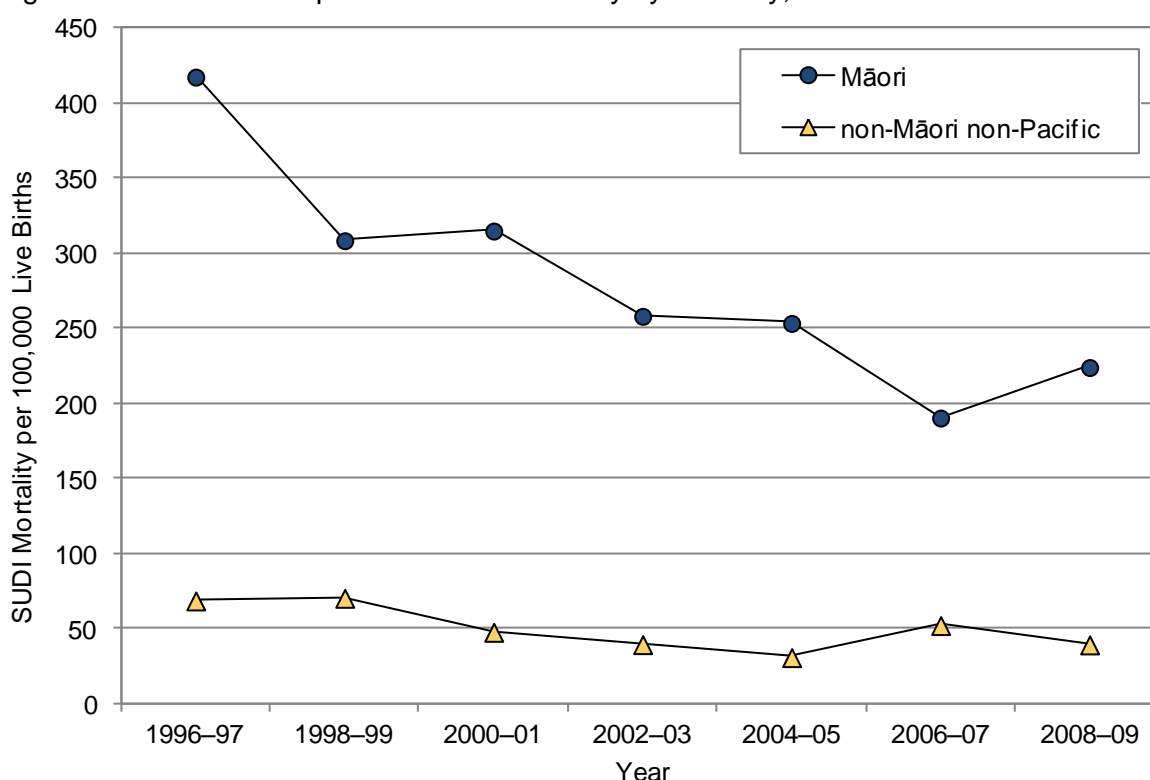
Ethnicity	Number: Total 2005–2009	Number: Annual Average	Rate per 100,000	Rate Ratio	95% CI
Sudden Unexpected Death in Infancy					
Māori	195	39.0	211.50	4.99	3.85–6.49
non-Māori non-Pacific	79	15.8	42.35	1.00	

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Note: Rates are per 100,000 live births; Rate Ratios are unadjusted

Trends by Ethnicity

In New Zealand during 1996–2009, SUDI mortality was consistently higher for Māori than for non-Māori non-Pacific infants. Rates for both ethnic groups however, exhibited a general downward trend during the late 1990s through to the mid-2000s (**Figure 51**).

Figure 51. Sudden Unexpected Death in Infancy by Ethnicity, New Zealand 1996–2009



Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset

New Zealand Distribution

Neonatal and Post Neonatal Mortality: New Zealand Trends

In New Zealand during the 1990s, neonatal and post neonatal mortality both declined, although rates were more static during the mid to late 2000s. An upswing in neonatal mortality was evident during 2007–2009. However it is too early to say whether this is a random fluctuation or the beginning of an upward trend.

Neonatal and Post Neonatal Mortality: Distribution by NZDep Index Decile and Gender

In New Zealand during 2005–2009, neonatal mortality was *significantly* higher for males and for those from average to more deprived (NZDep deciles 5–10) areas. During the same period, post neonatal mortality was also *significantly* higher for males and for those from more deprived (NZDep deciles 7–10) areas.

SUDI: New Zealand Trends

In New Zealand, SUDI rates declined during the late 1990s and early 2000s, but became more static after 2002–03. When broken down by SUDI sub-type, deaths attributed to SIDS continued to decline throughout 1996–2009, 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.

SUDI: Distribution by Age

In New Zealand during 2005–2009, SUDI mortality was highest in infants 4–7 weeks, followed by those aged 8–11 weeks and then those 0–3 weeks of age. SUDI: Suffocation/Strangulation in Bed accounted for 61.0% of all SUDI deaths in those aged 0–3 weeks and 38.2% of SUDI deaths in those aged 4–7 weeks.

SUDI: Distribution by NZ Deprivation Index Decile

In New Zealand during 2005–2009, mortality from SUDI was *significantly* higher for infants from more deprived (NZDep deciles 7–10) areas than for infants from the least deprived (NZDep deciles 1–2) areas.

Local Policy Documents and Evidence-Based Reviews Relevant to the Prevention of SUDI

The Determinants of Health for Children and Young People in New Zealand [4] provides a brief overview of local policy documents and evidence-based reviews relevant to the prevention of SUDI.





SAFETY AND FAMILY VIOLENCE

INJURIES ARISING FROM THE ASSAULT, NEGLIGENCE, OR MALTREATMENT OF CHILDREN

Introduction

The following section reviews hospital admissions for injuries arising from the assault, neglect or maltreatment of Māori children aged 0–14 years using information from the National Minimum Dataset and the National Mortality Collection.

Background

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 [120]. It includes neglect, physical, sexual and emotional abuse, and fabricated or induced illness, and is linked to harmful short-term and long-term effects [121].

A UNICEF report on child maltreatment deaths, from 1994 to 1998, placed New Zealand near the bottom for deaths in the OECD, at number 24 out of 27 countries [122]. The mortality rate for New Zealand was 1.2 deaths per 100,000 children under the age of 15 years, compared to the OECD median of 0.6 deaths per 100,000 children. A recent study published in the Lancet found no clear evidence of a decrease in child maltreatment in New Zealand over the past two decades [123].

Similarly, the Child and Youth Mortality Review Committee found that between 2006 and 2010 there were 36 deaths due to assault among children aged 28 days to 14 years [124]. Between 2006 and 2010 there were also 39.1 per 100,000 hospital admissions for Māori children for injuries arising from assault, neglect or maltreatment, as compared to 11.8 per 100,000 for European children [125]. The rate of hospitalisation also increased with increasing socioeconomic deprivation (RR 5.59, 95% CI 4.22–7.41 for NZDep deciles 9–10 vs. deciles 1–2), with rates of hospitalisation for males (24.3 per 100,000) also being higher than for females (13.9 per 100,000) [125].

Data Source and Methods

Definition

1. Hospitalisations for injuries arising from the assault, neglect or maltreatment of children aged 0–14 years
2. Deaths from injuries arising from the assault, neglect or maltreatment of children aged 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 2**, 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 (projected from 2007)

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 (projected from 2007)

Interpretation

The limitations of the National Minimum Dataset are discussed at length in **Appendix 2**. The reader is urged to review this Appendix before interpreting any trends based on hospital admission data.

Nature of the Injury Sustained

Amongst Māori children aged 0–14 years who were hospitalised with injuries sustained as the result of assault, neglect or maltreatment during 2007–2011, traumatic subdural haemorrhages were the most frequently assigned primary diagnosis, followed by superficial head injuries. Head injuries as a group, accounted for 63.7% of admissions (**Table 41**).



Table 41. Nature of Injuries Arising from Assault, Neglect or Maltreatment in Hospitalised Māori Children Aged 0–14 Years, New Zealand 2007–2011

Primary Diagnosis	Number: Total 2007–2011	Number: Annual Average	% of Total
Assault, Neglect or Maltreatment Admissions			
Māori Children 0–14 Years			
Traumatic Subdural Haemorrhage	74	14.8	18.1
Superficial Head Injury	54	10.8	13.2
Open Wound of Head	25	5.0	6.1
Concussion	24	4.8	5.9
Fracture of Mandible (Jaw)	11	2.2	2.7
Fracture of Nasal Bones	11	2.2	2.7
Other Fracture of Skull/Facial Bones	19	3.8	4.7
Other Head Injuries	42	8.4	10.3
Neck/Thorax Injuries (Including Rib Fractures)	19	3.8	4.7
Abdominal/Lower Back/Lumbar Spine/Pelvis Injuries	20	4.0	4.9
Shoulder/Upper Arm Injuries	14	2.8	3.4
Elbow and Forearm Injuries	17	3.4	4.2
Fracture/Other Injuries Wrist/Hand	15	3.0	3.7
Fracture Femur/Other Injuries Hip/Thigh	11	2.2	2.7
Knee/Lower Leg/Foot/Ankle Injuries	10	2.0	2.5
Maltreatment	28	5.6	6.9
Other Injuries	14	2.8	3.4
Total	408	81.6	100.0

Source: National Minimum Dataset

Distribution by Ethnicity

In New Zealand during 2007–2011, hospital admissions for injuries arising from assault, neglect or maltreatment were *significantly* higher for Māori children than for non-Māori non-Pacific children (**Table 42**). While similar ethnic differences were seen during 2000–2011, admission rates for Māori children increased during the mid 2000s, but then declined during 2010–2011. In contrast, admissions for non-Māori non-Pacific children declined for the majority of 2000–2011 (**Figure 52**).

Table 42. Hospital Admissions for Injuries Arising from the Assault, Neglect or Maltreatment of Children 0–14 Years by Ethnicity, New Zealand 2007–2011

Ethnicity	Rate	Rate Ratio	95% CI
Assault, Neglect or Maltreatment Admissions			
Māori	36.03	3.24	2.80–3.75
non-Māori non-Pacific	11.13	1.00	

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: Rate is per 100,000; Rate Ratios are unadjusted

Distribution by Age

In New Zealand during 2007–2011, hospital admissions for injuries arising from the assault, neglect or maltreatment of Māori children exhibited a U-shaped distribution with age, with the highest rates being seen in infants less than one year. Admissions were less frequent during mid-childhood, but increased again after eleven years of age (**Figure 53**).

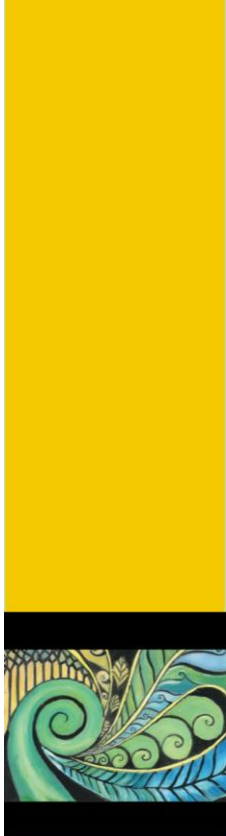
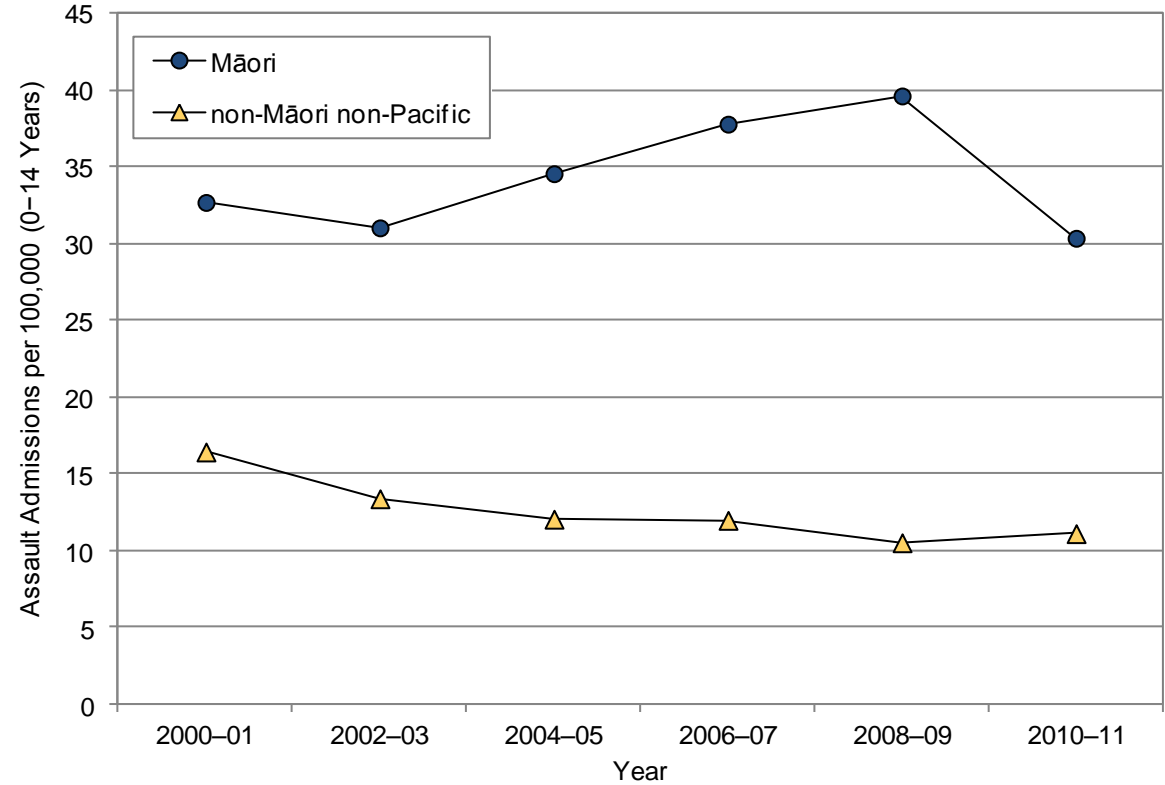
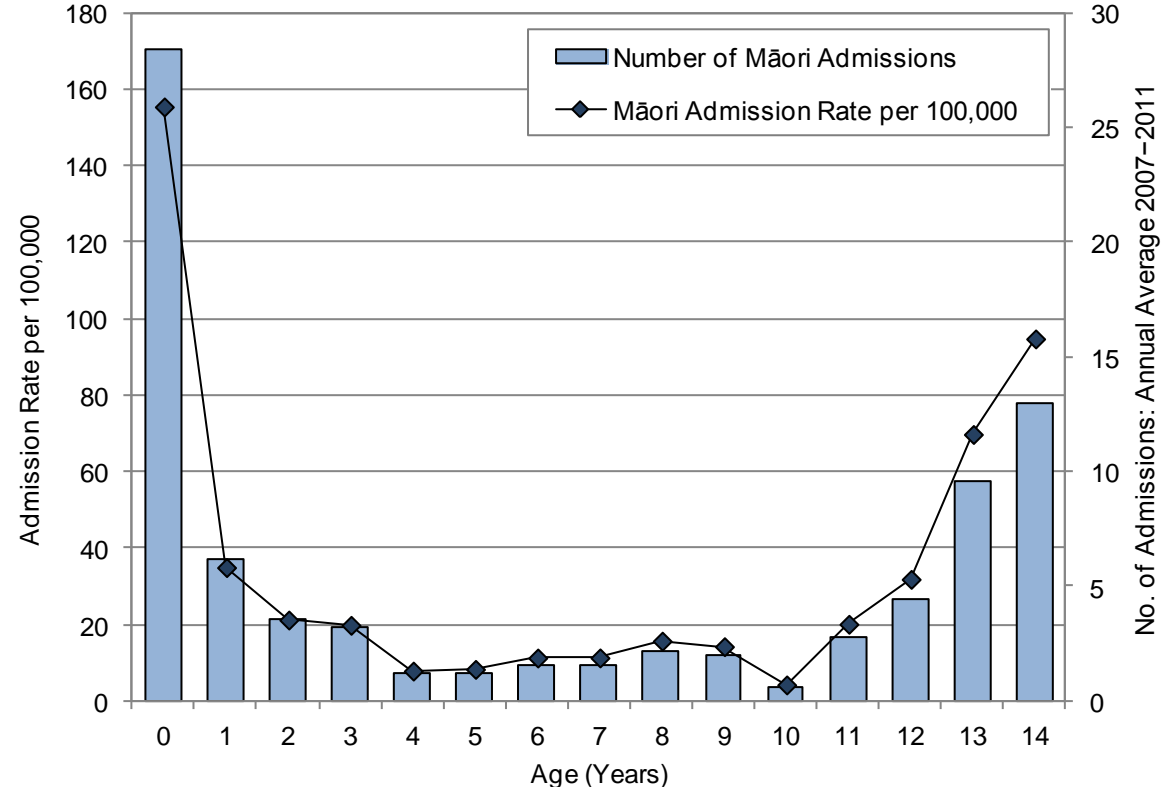


Figure 52. Hospital Admissions for Injuries Arising from the Assault, Neglect or Maltreatment of Children 0–14 Years by Ethnicity, New Zealand 2000–2011



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population (projected from 2007)

Figure 53. Hospital Admissions for Injuries Arising from the Assault, Neglect or Maltreatment of Māori Children by Age, New Zealand 2007–2011



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population (projected from 2007)

Local Policy Documents and Evidence-Based Reviews Relevant to the Prevention of the Assault, Neglect or Maltreatment of Children

The Determinants of Health for Children and Young People in New Zealand [4] provides a brief overview of local policy documents and evidence-based reviews relevant to the prevention of the assault, neglect or maltreatment of children.



INJURIES ARISING FROM ASSAULT IN YOUNG PEOPLE

Introduction

The following section explores hospital admissions for injuries arising from assault in Māori young people aged 15–24 years using information from the National Minimum Dataset and the National Mortality Collection.

Background

In 2007, the Youth'07 survey of 9,107 secondary school students from across New Zealand, assessed self-reported experiences of violence. It found that while violent and anti-social behaviours had reduced since an earlier 2001 survey, experiences of violence were common [126]. Overall, 63.9% of Māori students reported that they had (ever) been deliberately harmed by someone, a figure that was similar to that of European students (61.6%), with 44.8% of Māori students also reporting that they had been deliberately harmed in the last 12 months [113]. In the Youth'07 Survey, being exposed to violence in the home, at school, or in the community, was strongly associated with instigating violence against others and being a victim of violence, as well as with symptoms of depression and an increased risk of suicide attempts [126].

Viewed from a different perspective, the rate of Police apprehensions for violent offending increased for all age groups from 14 to 50 years between 1997 and 2007 [127]. The most marked increases were seen among those aged 14 to 16 years, with the rate peaking at 194 per 10,000 population in 2007, compared to 167 per 10,000 population in 1995 [128]. However, it is unclear whether this increase represents a true increase in violence, changes in reporting and policing practices, or a combination of these factors. Further, apprehension data represents the number of apprehensions, rather than the number of offenders, and excludes violence that is not officially reported or recorded [127].

Data Source and Methods

Definition

1. Hospitalisations 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 2**, 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 (projected from 2007)

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 (projected from 2007)

Interpretation

The limitations of the National Minimum Dataset are discussed at length in **Appendix 2**. The reader is urged to review this Appendix before interpreting any trends based on hospital admission data.

Nature of the Injury Sustained

Amongst Māori young people hospitalised as the result of an assault during 2007–2011, fractures of the lower jaw were the most frequent primary diagnosis assigned, followed by fractures of the wrist and hand. Head and upper limb injuries collectively accounted for 81.8% of admissions (**Table 43**).



Table 43. Nature of Injuries Arising from Assault in Hospitalised Māori Young People Aged 15–24 Years, New Zealand 2007–2011

Primary Diagnosis	Number: Total 2007–2011	Number: Annual Average	% of Total
Assault Admissions			
Māori Young People 15–24 Years			
Fracture of Mandible (Jaw)	437	87.4	23.0
Fracture of Nasal Bones	74	14.8	3.9
Fracture of Orbital Floor	53	10.6	2.8
Fracture Malar/Maxillary Bones	46	9.2	2.4
Other Fracture of Skull/Facial Bones	45	9.0	2.4
Open Wound Eyelid/Eye Area	37	7.4	1.9
Other Open Wound of Head	103	20.6	5.4
Concussion	97	19.4	5.1
Superficial Head Injury	51	10.2	2.7
Traumatic Subdural Haemorrhage	24	4.8	1.3
Other Head Injuries	155	31.0	8.2
Neck Injury	37	7.4	1.9
Thorax Injuries (including rib fractures)	72	14.4	3.8
Abdominal/Lower Back/Lumbar Spine/Pelvis Injuries	141	28.2	7.4
Shoulder/Upper Arm Injuries	44	8.8	2.3
Elbow and Forearm Injuries	107	21.4	5.6
Fracture of Wrist/Hand	117	23.4	6.2
Other Injuries Wrist/Hand	163	32.6	8.6
Hip/Thigh Injuries	15	3.0	0.8
Injuries to Knee/Lower Leg/Foot/Ankle	53	10.6	2.8
Other Injuries	28	5.6	1.5
Total	1,899	379.8	100.0

Source: National Minimum Dataset

Distribution by Ethnicity

In New Zealand during 2007–2011, hospital admissions for injuries arising from assault were *significantly* higher for Māori young people than for non-Māori non-Pacific young people (**Table 44**). Similar ethnic differences were seen during 2000–2011, with admission rates for both Māori and non-Māori non-Pacific young people remaining relatively static during this period (**Figure 54**).

Table 44. Hospital Admissions for Injuries Arising from Assault in Young People Aged 15–24 Years by Ethnicity, New Zealand 2007–2011

Ethnicity	Rate	Rate Ratio	95% CI
Assault Admissions			
Māori	306.5	2.41	2.28–2.56
non-Māori non-Pacific	126.9	1.00	

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: Rate is per 100,000; Rate Ratios are unadjusted

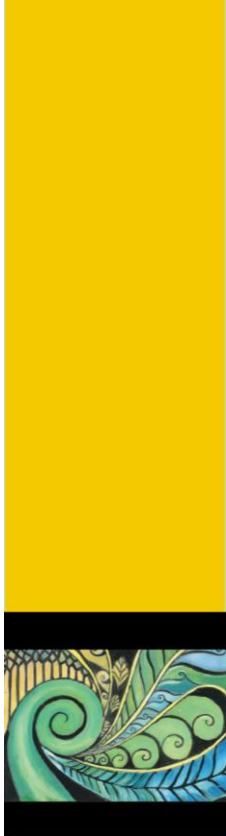
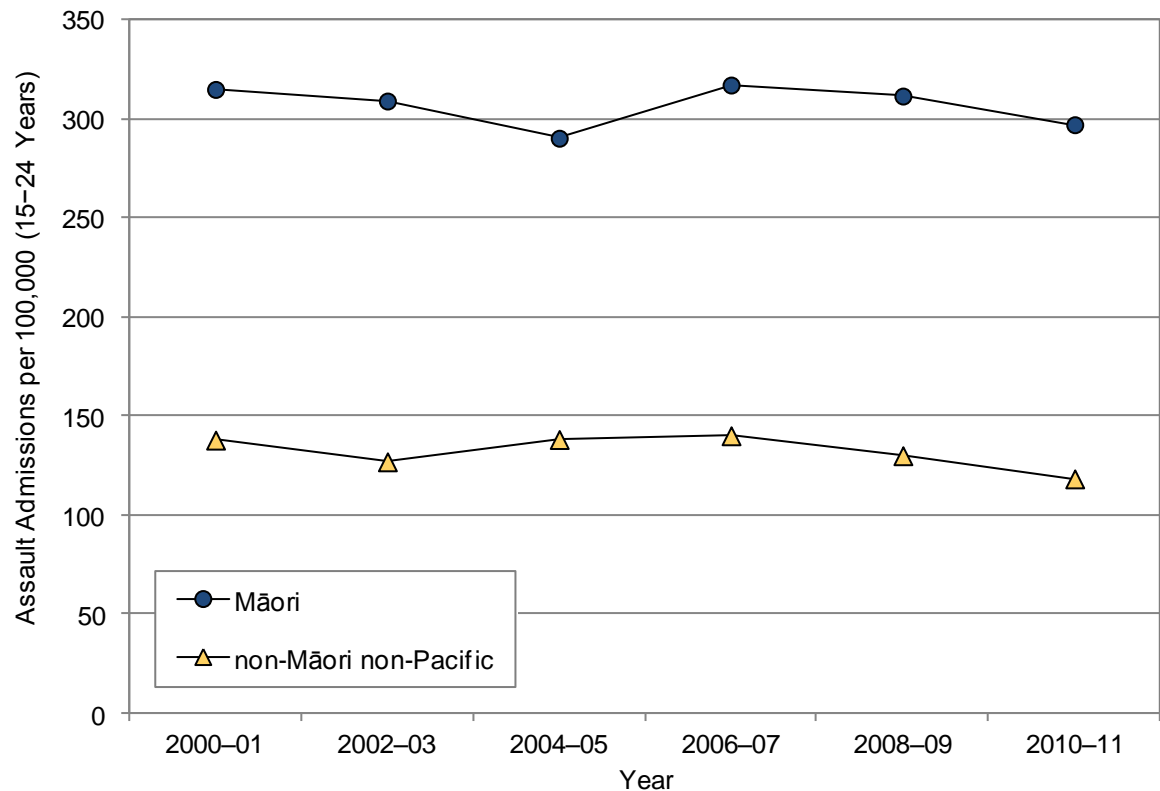
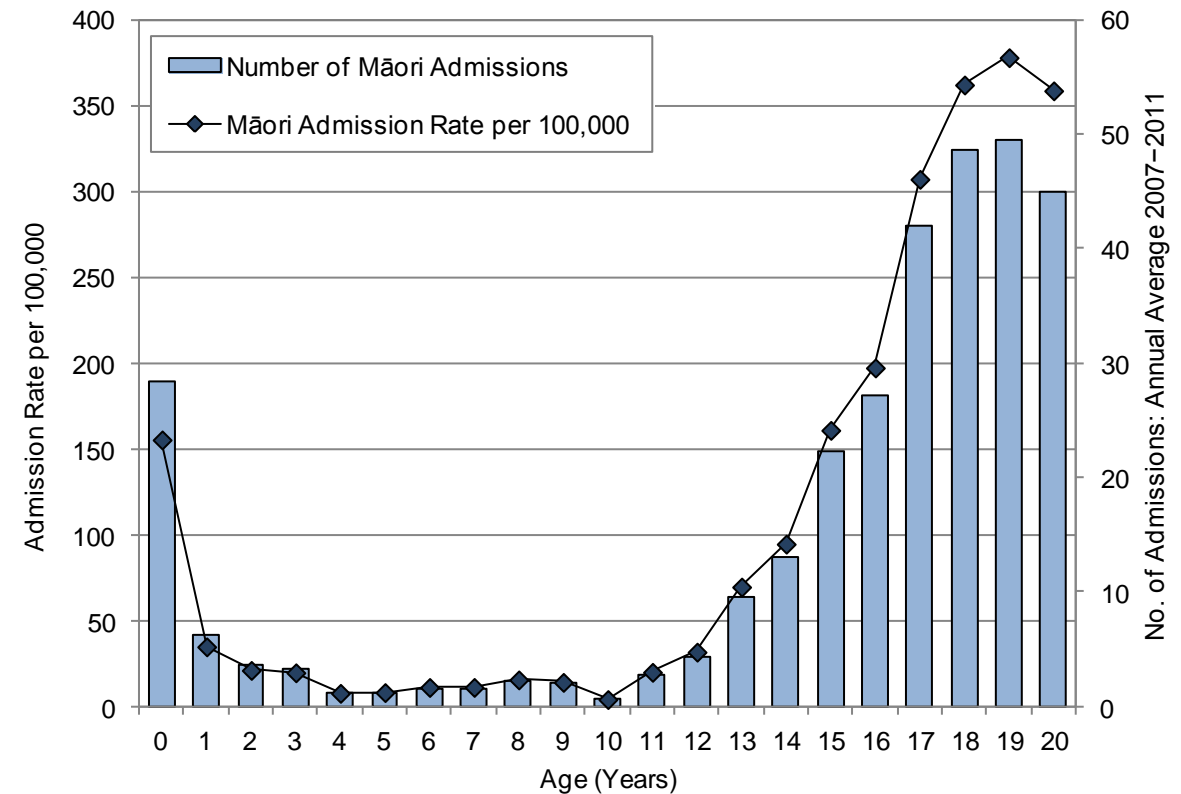


Figure 54. Hospital Admissions for Injuries Arising from Assault in Young People Aged 15–24 Years by Ethnicity, New Zealand 2000–2011



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population (projected from 2007)

Figure 55. Hospital Admissions for Injuries Arising from the Assault of Māori Children and Young People by Age, New Zealand 2007–2011



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population (projected from 2007)

Distribution by Age

Amongst Māori children and young people during 2007–2011, hospital admissions for injuries arising from assault exhibited a J shaped distribution with age, with rates being high in infants under one year, but then decreasing during childhood. Rates then increased rapidly amongst those in their mid to late teens, to reach a peak at 19 years of age (**Figure 55**).

Local Policy Documents and Evidence-Based Reviews Relevant to the Assault of Young People

In New Zealand, there is no single strategy focussed on the prevention of assault in young people. The Determinants of Health for Children and Young People in New Zealand [4] however, provides a brief overview of the available local and overseas literature in this area.



CHILD YOUTH AND FAMILY NOTIFICATIONS

Introduction

The following section reviews the number of care and protection notifications received by Child Youth and Family (CYF) offices during 2004–2011, as well as the outcome of assessments for children and young people notified to CYF.

Background

In New Zealand, Child, Youth and Family (CYF), a service of the Ministry of Social Development, has responsibility, under the Children, Young Persons and their Families Act, 1989, for protecting children and young people who are at risk of being or who have been abused or neglected [129]. When CYF receive a report of concern, for example from the education or health sectors, families/whānau or the general public, its staff are legally bound to follow it up [130]. CYF works closely with the New Zealand Police, whose primary duties are to protect victims and consider questions of criminal liability for perpetrators.

In New Zealand, the total number of reports of concern received by CYF increased from 71,927 in 2006/2007 to 152,800 in 2011/2012, with these increases being thought to reflect an increased public awareness of the need for the care and protection of children and a growing willingness by communities to contact CYF where there are concerns for a child's welfare [131,132]. The proportion of reports of concern requiring further action declined during this period however, from 61% in 2006/2007 to 38% in 2010/2011 [131]. Emotional abuse (which includes witnessing family violence) was the most common finding from investigations completed during June 2011–2012 (12,114 investigations), followed by neglect (4,766 investigations), physical abuse (3,249 investigations) and sexual abuse (1,396 investigations) [132].

In interpreting these trends, it is also important to recognise that at each point in the referral pathway, from the notifier, to the telephone operator, to the intake social worker, a decision has to be made about whether to escalate the concern further, with these decisions often being made in the context of insufficient or conflicting information, time pressures and an increasing intolerance within the community of child abuse. The consequences of errors in child protection decisions however (which may be unavoidable given the conditions of inherent uncertainty), can be damaging to children and their whānau/families [133]. In the worst case scenario missing a concern could result in an avoidable child death, while a false alarm, an investigation where no harm or abuse is substantiated, can result in humiliation, anger and fear for parents and misdirected resources.

Data Source and Methods

Definition

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. Outcome of assessments for children and young people notified to Child, Youth and Family

Data Source

Numerator: Care and protection notifications received by Child, Youth and Family

Denominator: Not applicable (see notes below)

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 assessment findings 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 NZCYES Reports as Child, Youth and Family no longer include the intakes received under court order (S19 of the Children, Young Persons, and Their Families Act 1989 and s132 of the Care of Children Act 2004) in routine reporting, 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 does not include any information on the ethnicity of individual children and young people, although this information is available for those requiring further assessment. Thus in this section, ethnicity data is presented only for those for whom further assessment was required.

Number of Notifications and Proportion Requiring Further Assessment

In New Zealand during 2011, a total of 150,747 care and protection notifications were received by CYF offices, with 38.4% being thought to require further assessment. While these figures reflect a progressive increase in notifications since 2004, when 40,939 were received, the proportion requiring further assessment declined (86.3% required further assessment in 2004). The absolute number of notifications requiring further assessment however continued to increase, from 35,350 in 2004 to 57,949 in 2011, an increase of 63.9% over this period (**Table 45, Figure 56**).

Table 45. Number of Notifications Received by Child Youth and Family Offices, New Zealand 2004–2011 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	150,747	57,949	38.4

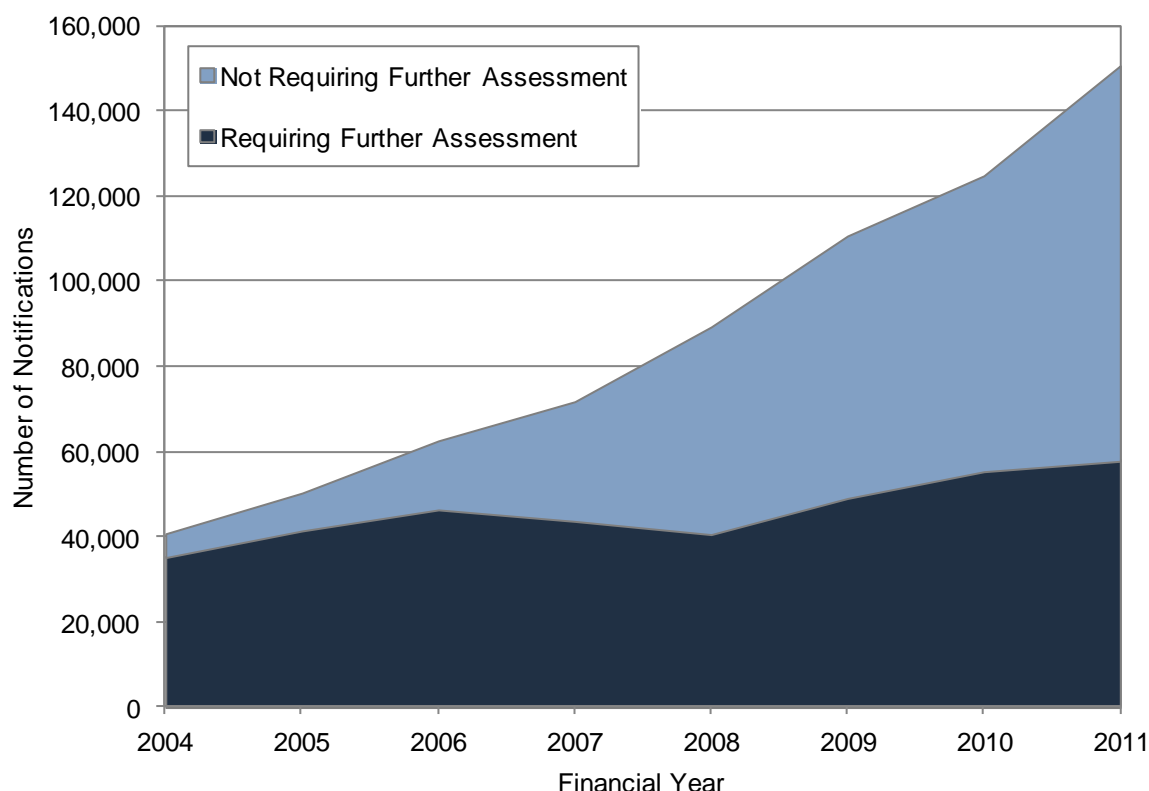
Source: Child Youth and Family

Table 46. Outcome of Assessment for Children and Young People Notified to Child Youth and Family, New Zealand 2004–2012 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	12,595	3,225	1,505	4,762	4,908	147	30,286
2012	12,114	3,249	1,396	4,766	4,840	153	31,583

Source: Child Youth and Family

Figure 56. Number of Notifications Received by Child Youth and Family Offices by Outcome, New Zealand 2004–2011 Financial Years



Source: Child Youth and Family

Assessment Findings for Cases Requiring Further Investigation

Of those notifications which were assessed further during 2004–2011, 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 46**). 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).

Notifications Requiring Further Assessment by Ethnicity

In New Zealand during 2004–2011, 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 47**). During the 2011 financial year, 45.6% of notifications requiring further assessment were for Māori children and young people, while 32.0% were for European, 11.4% were for Pacific, and 1.9% were for Asian children and young people (**Figure 57**).

Source of CYF Care and Protection Notifications

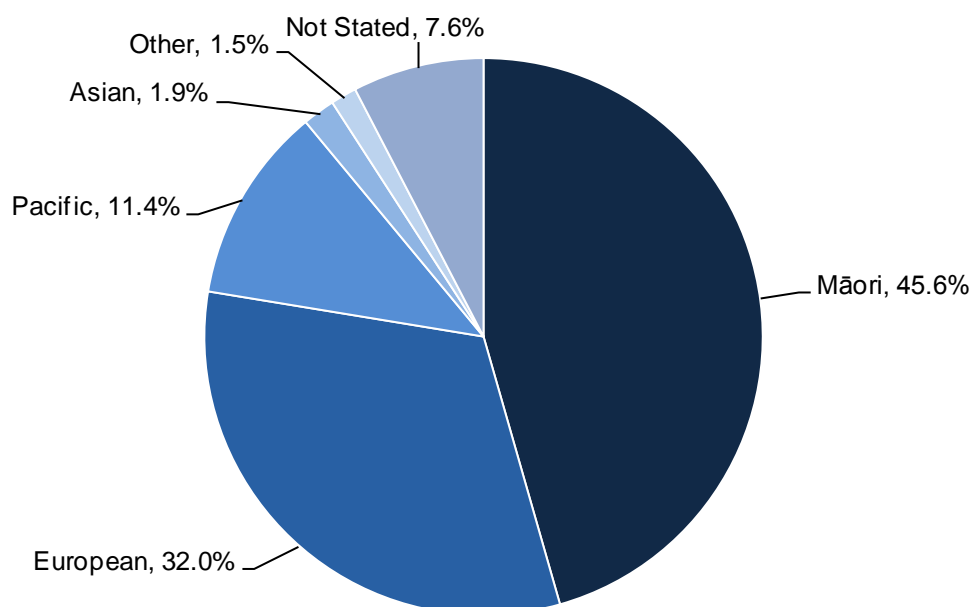
In New Zealand during 2004, family members and the police were the most frequent sources of CYF care and protection notifications, followed by the education and health sectors. While the number of notifications received from all referral sources rose during 2004–2011, the largest increases were seen for Police family violence referrals. Thus by 2011, Police family violence referrals were the most frequent source of CYF notifications, followed by the Police (other referral types) and the health sector. However, the proportion of Police family violence referrals which required further assessment declined, from 70.5% in 2004 to 15.4% in 2011. While similar trends were seen for other referral sources, the magnitude of these declines was much less marked (**Table 48**).

Table 47. Number of Notifications to Child, Youth and Family Requiring Further Assessment by Ethnicity, New Zealand 2004–2011 Financial Years

Year	Number Requiring Further Assessment						
	New Zealand						
	Māori	European	Pacific	Asian	Other	Not Stated	Total
2004	12,001	13,318	3,092	572	629	5,738	35,350
2005	15,456	14,186	3,767	763	712	6,715	41,599
2006	17,730	14,676	4,964	877	810	7,484	46,541
2007	18,791	13,707	4,927	901	750	4,769	43,845
2008	18,438	14,201	5,016	835	662	1,587	40,739
2009	23,220	15,963	5,857	1,008	709	2,467	49,224
2010	25,676	18,103	6,912	1,100	682	3,021	55,494
2011	26,405	18,555	6,599	1,094	873	4,423	57,949

Source: Child Youth and Family

Figure 57. Proportion of Notifications to Child, Youth and Family Requiring Further Assessment by Ethnicity, New Zealand 2011 Financial Year (n=57,949)



Source: Child Youth and Family

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.

New Zealand Distribution

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 2004–2011, the largest increases were seen for Police family violence referrals. Thus by 2011, Police family violence referrals were the most frequent source of CYF notifications, followed by the Police (other referral types) and the health sector. However, the proportion of Police family violence referrals which required further assessment declined, from 70.5% in 2004 to 15.4% in 2011. While similar trends were seen for other referral sources, the magnitude of these declines was much less marked.

Table 48. Number of Notifications to Child, Youth and Family and Proportion Requiring Further Assessment by Referrer, New Zealand 2004–2011 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	82,240	10,383	14,903	10,995	8,115	807	23,177	127	150,747
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	12,686	6,006	10,226	6,937	6,061	692	15,274	67	57,949
% 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	15.4	57.8	68.6	63.1	74.7	85.7	65.9	52.8	38.4

Source: Child Youth and Family

Local Policy Documents and Evidence-Based Reviews Relevant to Child Abuse and Family Violence

The Determinants of Health for Children and Young People in New Zealand [4] provides a brief overview of local policy documents and evidence-based reviews relevant to the prevention of child abuse and family violence.

FAMILY VIOLENCE

Introduction

The following section reviews the number of Police family violence investigations occurring during 2009–2011. While no information was available on the victims of family violence by ethnicity, research suggests that Māori children may have a higher exposure to violence in childhood, including child abuse and exposure to inter-parental violence, than their non-Māori peers [134]. Further, the National Survey of Crime Victims 2001 (sample size approx. 5,300, including 947 Māori participants) found that the lifetime prevalence of inter partner violence was higher for Māori women (49%) than for European women (24%) [135]. Similarly the Youth '07 survey of 9,107 secondary school students from across New Zealand in 2007 found that Māori students were significantly more likely to report witnessing an adult hitting or physically hurting a child, or hitting or physically hurting another adult, than their European counterparts [126]. Thus the national data presented in this section is likely to be of as much relevance to Māori children and young people, as to those of other ethnic groups.

When interpreting the data presented however, it must be remembered that research also suggests that Police are only involved in around 10% of the family violence incidents occurring in New Zealand each year [136]. Thus these figures need to be viewed as the “tip of the iceberg” in terms of prevalence. Further, trends may also be sensitive to public awareness campaigns and changes in the way the Police recognise and record family violence incidents. Despite this, it is hoped that these figures will provide some insights into the context surrounding family violence in New Zealand.

Data Source and Methods

Definition

1. Number of Police family violence investigations

Family violence investigations are jobs Police deal with as family violence. A given family violence investigation may relate to one or more offences and/or non-offence incidents. Only one of these (usually the most severe) is used to categorise the investigation.

Data Source

Numerator: Family violence investigations as recorded in the police's operational database

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), but does not include neighbours.

Note 2: It is likely that family violence-related offending is significantly under-reported to Police, and that recent publicity campaigns, combined with an increased Police focus on family violence, have driven increases in police statistics for family violence. Therefore, inferences about trends in the prevalence of family violence should not be made from these statistics.

Note 3: Changes in the way in which the Police produce statistics mean that some of the data presented here differs from that provided to DHBs in 2009. For example, the Police now do not routinely produce statistics on role types for those involved in family violence investigations and thus information on the ethnicity of the victims of family violence incidents is no longer available. In addition, in July 2010 the Police adapted the Australia New Zealand Standard Offence Classification (ANZSOC) to align with wider Justice Sector reporting. The offence groupings used in this report are thus based on the ANZSOC Group Description, rather than the old TPOC Offence Types reported previously. Finally, Police in recent months have made changes to the Police Area boundaries resulting in the aggregation of Lower Hutt and Upper Hutt into the Hutt Valley Area; the aggregation of Hastings and Napier into the Hawke's Bay Area; and the renaming of Wanganui and Gisborne as the Whanganui and Tairāwhiti Areas, respectively.

Note 4: All of the data in this section were extracted from the Police's dynamic operational database on 29 June 2012. Data in this database are subject to change as new information is continually recorded. The lack of a clearly defined denominator for the reported Police Areas however precluded the calculation of rates.

Family Violence Investigations Where Children Were Present

Of the 86,704 Police family violence investigations which occurred in New Zealand during 2011, children were reported as being present or usually residing with the victim in 54.0% of cases (**Table 49**).

Table 49. Number and Proportion of Police Family Violence Investigations where Children were Present or Usually Residing with the Victim, New Zealand 2009–2011

Year	Number of Family Violence Investigations		% Family Violence Investigations where Children were Present*
	Children Present*	Total	
2009	40,852	77,863	52.5%
2010	45,588	84,618	53.9%
2011	46,860	86,704	54.0%

Source: NZ Police; Note: *Children were present or usually residing with the victim

Relationship Between the Offender and the Victim

In New Zealand during 2011, there were 35,536 Police family violence investigations where an offence occurred, and where the relationship between the offender and the victim or complainant was recorded. In 40.6% of cases the victim/complainant was the spouse or partner of the offender, with a further 24.4% having been either previously married or in a relationship. In 20.3% of cases there was a parent/child relationship between the offender and the victim or complainant (**Table 50, Figure 58**).

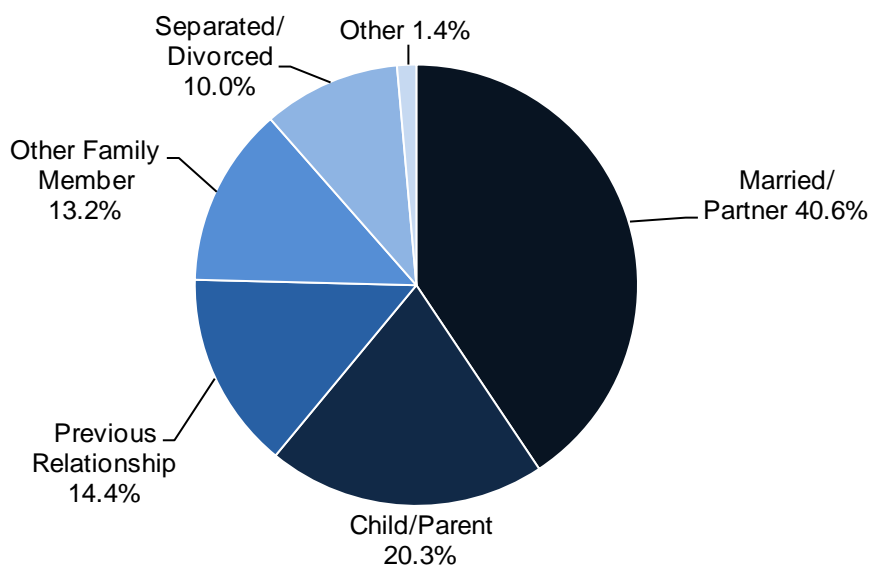
Table 50. Relationship Between the Offender and the Victim in Police Family Violence Investigations where an Offence Occurred, New Zealand 2009–2011

Relationship	2009		2010		2011	
	Number	%	Number	%	Number	%
Married/Partner	16,193	42.9%	16,623	42.0%	14,445	40.6%
Child/Parent	6,582	17.5%	7,218	18.2%	7,219	20.3%
Previous Relationship	5,287	14.0%	5,616	14.2%	5,129	14.4%
Other Family Member	4,455	11.8%	4,819	12.2%	4,679	13.2%
Separated/Divorced	3,778	10.0%	3,900	9.8%	3,566	10.0%
Other	1,415	3.8%	1,419	3.6%	498	1.4%
Total	37,710	100.0%	39,595	100.0%	35,536	100.0%

Source: NZ Police



Figure 58. Relationship Between the Offender and the Victim in Police Family Violence Investigations where an Offence Occurred, New Zealand 2011



Source: NZ Police

Table 51. Police Family Violence Investigations where Injuries were Reported by Injury Type, New Zealand 2009–2011

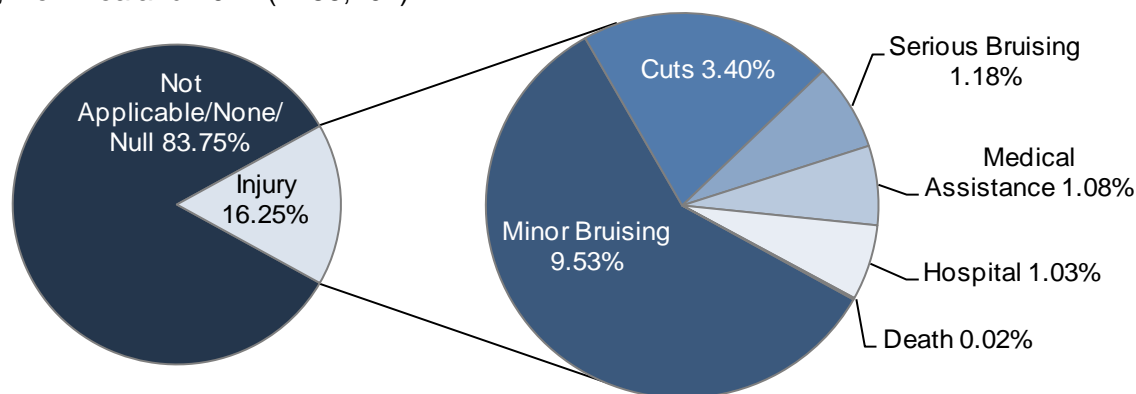
Injury Reported	2009		2010		2011	
	Number	%	Number	%	Number	%
None	15,473	19.87%	17,037	20.13%	17,684	20.40%
Minor Bruising	8,556	10.99%	8,758	10.35%	8,264	9.53%
Cuts	2,749	3.53%	3,003	3.55%	2,949	3.40%
Serious Bruising	1,062	1.36%	1,132	1.34%	1,026	1.18%
Medical Assistance	854	1.10%	931	1.10%	939	1.08%
Hospital	783	1.01%	874	1.03%	893	1.03%
Death	45	0.06%	31	0.04%	20	0.02%
Not Applicable/Null	48,341	62.08%	52,852	62.46%	54,929	63.35%
Total	77,863	100.00%	84,618	100.00%	86,704	100.00%

Source: NZ Police

Family Violence Investigations Where Injuries Were Reported

In New Zealand during 2011, injuries were reported in 16.3% of Police family violence investigations. The most common injuries reported were minor bruising (9.5%), cuts (3.4%) and serious bruising (1.2%). In 893 cases (1.0%) a hospital attendance was required, and in 20 cases (0.02%) the incident resulted in a death (**Table 51, Figure 59**).

Figure 59. Police Family Violence Investigations where Injuries were Reported by Injury Type, New Zealand 2011 (n=86,704)



Source: NZ Police

Family Violence Investigations Where an Offence Occurred

Police family violence investigations during 2011 resulted in 39,935 offences being disclosed. While not all family violence investigations identified an offence and some investigations identified more than one offence, the nature of the offences disclosed gives some indication as to the types of incidents occurring. In this context, a very high proportion of the offences related to assaults, with property damage, breach of violence orders, and threatening behaviour also making a significant contribution (**Table 52**).

Table 52. Police Family Violence Investigations where an Offence Occurred by Offence Group, New Zealand 2009–2011

Offence Type	2009		2010		2011	
	Number	%	Number	%	Number	%
Assault Not Further Defined	12,012	30.5%	11,785	28.0%	11,307	28.3%
Common Assault	9,594	24.3%	10,824	25.7%	10,217	25.6%
Property Damage, NEC	4,071	10.3%	4,383	10.4%	4,308	10.8%
Breach of Violence Order	3,715	9.4%	3,983	9.5%	3,808	9.5%
Threatening Behaviour	3,842	9.7%	3,854	9.2%	3,590	9.0%
Trespass	1,771	4.5%	2,092	5.0%	1,849	4.6%
Disorderly Conduct, NEC	1,612	4.1%	1,941	4.6%	1,795	4.5%
Aggravated Sexual Assault	543	1.4%	593	1.4%	592	1.5%
Misuse Weapons/Explosives	440	1.1%	474	1.1%	404	1.0%
Harassment and Private Nuisance	355	0.9%	399	0.9%	352	0.9%
Other Offences	1,464	3.7%	1,716	4.1%	1,713	4.3%
Total	39,419	100.0%	42,044	100.0%	39,935	100.0%

Source: NZ Police

Local Policy Documents and Evidence-Based Reviews Relevant to Family Violence

The Determinants of Health for Children and Young People in New Zealand [4] provides a brief overview of local policy documents and evidence-based reviews relevant to the prevention of family violence.



MENTAL HEALTH

ACCESS TO MENTAL HEALTH SERVICES: INTRODUCTION AND METHODS

Introduction

The Prevalence of Mental Health Issues in Children and Young People

In New Zealand, the community prevalence of mental health disorders in children is uncertain. The Dunedin Multidisciplinary Health and Development Study suggested that the prevalence of mental health problems increases as children move through adolescence [137]. In the Youth '07 survey of 9,107 secondary school students in 2007, 9.3% of students had a Strengths and Difficulties Questionnaire (SDQ) score above the 90th percentile, a finding consistent with an underlying mental health issue, with a higher proportion of Māori students (11.7%) than European students (8.1%) having a SDQ above the 90th percentile. In this survey, 16.4% of female Māori students and 4.9% of male Māori students reported symptoms of depression, with Māori females being significantly more likely to report symptoms of depression than European females (12.7%) but Māori males being significantly less likely to report symptoms of depression than European males (6.5%) [138].

A recent review of international community surveys however, found that anxiety disorders were the most frequent conditions in children, followed by behavioural disorders, mood disorders, and substance use disorders [139]. Those with the most severe disorders tended to receive mental health services, but fewer than half of young people with current mental disorders received mental health specialty treatment. Among younger children, the type of mental health problem also varies by age and gender. For example, there are differential peak periods of specific subtypes of anxiety: separation anxiety and specific phobias in middle childhood; overanxious disorder in late childhood; social phobia in middle adolescence; and panic disorder in late adolescence. ADHD, conduct disorder and oppositional defiant disorder are all more common in boys.

For young people, Te Rau Hinengaro, The New Zealand Mental Health Survey, found that the twelve month prevalence for any mental disorder was highest among the 16–24 year age group (28.6%, 95% CI 25.1–32.3) and declined across the age groups [140]. The lifetime prevalence of any psychiatric disorder was 41.6% (95% CI 37.4–45.9) for 16–24 year olds and half of all those with any psychiatric disorder reported the age of onset as 18 years or younger. Major depressive disorder and anxiety disorders (except obsessive compulsive disorder) were more common in females and alcohol and drug abuse and dependence were more common in males. The 12 month prevalence of any mental disorder was higher for Māori (29.5%, 95% CI 26.6–32.4) than for non-Māori non-Pacific peoples (19.3%; 95% CI 18.0–20.6), although these differences reduced after adjustment for age, sex, education and household income [141]. Māori were significantly less likely than non-Māori non-Pacific peoples to have had a visit to any service for a mental health problem, suggesting that, relative to need, Māori are less likely than non-Māori non-Pacific peoples to have contact with services [141].

Contents of Access to Mental Health Services Chapters

The following three sections use data from the Project for the Integration of Mental Health Data (PRIMHD) to explore access to mental health outpatient, community and inpatient services for Māori children and young people with specific mental health diagnoses. The diagnoses reviewed have been grouped into three clusters, which are loosely based on the age groups most commonly experiencing these conditions:

1. *Children 0–14 years:* Attention deficit hyperactivity disorder (ADHD), conduct/disruptive behaviour disorders, parent-child relational problems, autism/pervasive developmental disorders, learning disorders and intellectual disabilities.
2. *Children and young people 0–24 years:* Anxiety disorders, stress reaction/adjustment disorders, and eating disorders.



3. *Young people 15–24 years*: Schizophrenia and other psychotic disorders, personality disorders; depression, bipolar disorder and other mood disorders; and substance-related disorders (alcohol, cannabis, and other substances). This section also includes a small subsection which uses the National Minimum Dataset to explore hospital admissions for young people with mental health diagnoses.

In addition the *Suicide and Intentional Self-Harm* section commencing on **Page 204** considers suicide and self-harm in young people.

Cautions Relating to the Methodology Used

Because PRIMHD data is configured in a very different way to that contained in the National Minimum Dataset (hospital admissions) the reader is urged to review the methods section below, in order to become familiar with the strengths and limitations of PRIMHD, as well as the methodology used in the sections which follow.

Data Source and Methods

Definition

1. *Number of Children and Young People Accessing Mental Health Services by Mental Health Diagnosis*
2. *Contacts with Mental Health Services for Children and Young People by Mental Health Diagnosis*
3. *Inpatient Bed Nights for Children and Young People by Mental Health Diagnosis*

Data Source

Numerator: Project for the Integration of Mental Health Data (PRIMHD)

Individuals: Number of individuals accessing mental health services who ever received a specified mental health diagnosis. Diagnoses included DSM-IV Alcohol-Related Disorders (305.00, 303.90, 291.89, 291.1, 291.2, 291.5, 291.3, 303.00, 291.0, 291.9, 291.81); Cannabis-Related Disorders (305.20, 304.30); Other Substance-Related Disorders (305.70, 304.40, 292.11, 292.12, 292.81, 292.9, 292.0, 292.89, 305.60, 304.20, 292.84, 305.30, 304.50, 305.90, 292.82, 305.50, 304.00, 304.60, 305.40, 304.10, 292.83, 304.80, 304.90); Schizophrenia (295.20, 295.10, 295.30, 295.60, 295.90); Other Psychotic Disorders (295.40, 295.70, 297.1, 298.8, 297.3, 293.81, 293.82, 298.9); Bipolar Disorders (296.80, 296.56, 296.55, 296.51, 296.52, 296.53, 296.54, 296.50, 296.40, 296.46, 296.45, 296.41, 296.42, 296.43, 296.44, 296.40, 296.66, 296.65, 296.61, 296.62, 296.63, 296.64, 296.60, 296.7, 296.06, 296.05, 296.01, 296.02, 296.03, 296.04, 296.00, 296.89); Depression (296.36, 296.35, 296.31, 296.32, 296.33, 296.34, 296.30, 296.26, 296.25, 296.21, 296.22, 296.23, 296.24, 296.20, 311); Other Mood Disorders (300.4, 301.1.3, 293.83, 296.90); Anxiety Disorders (300.02, 300.21, 300.01, 300.22, 300.29, 300.23, 300.3, 309.81, 308.3, 293.84, 300.00); Adjustment Disorders (309.9, 309.24, 309.0, 309.3, 309.28, 309.4); Eating Disorders (307.1, 307.51, 307.50); Personality Disorders (301.0, 301.20, 301.22, 301.7, 301.83, 301.50, 301.81, 301.82, 301.6, 301.4, 301.9); Mental Retardation (317, 318.0, 318.1, 318.2, 319); Autism/Pervasive Developmental Disorders (299.00, 299.80, 299.10); Attention Deficit Hyperactivity Disorder (314.01, 314.00, 314.9); Conduct/Disruptive Behaviour Disorders (312.81, 312.82, 312.89, 313.81, 312.9); Learning Disorders (315.00, 315.1, 315.2, 315.9); Parent-Child Relational Problem (V612.0)

Contacts: Individual contacts, attendances, groups or day programmes reported to PRIMHD. Examples of contacts include mental health crisis attendances, individual treatment or group program attendances, healthcare coordination contacts, support needs assessment attendances, court liaison attendances, day program attendances, home based care contacts, and contacts with family/Whānau.

Bed Nights: Where a client occupies a bed at midnight in a ward or residential facility. Examples of bed nights include acute, sub-acute and respite mental health inpatient bed nights; mental health maximum, medium and minimum secure inpatient bed nights; community mental health residential bed nights.

Denominator: Statistics NZ Projected Population

Notes on Interpretation

Note 1: PRIMHD is the Ministry of Health's national database covering the provision of publicly funded secondary mental health and alcohol and drug services. Commencing on July 1 2008, it integrates information from the previous Mental Health Information National Collection (MHINC) and the MH-SMART data collection. It includes secondary inpatient, outpatient and community care provided by hospitals and non-Government organisations (although data from NGOs is incomplete). It does not include information on outpatient visits to paediatricians, and in the context where local referral pathways result in children seeing a paediatrician rather than a mental health professional for behavioural or emotional problems, this may significantly underestimate the prevalence of mental health issues (e.g. autism, ADHD, learning disorders) in the community. Referral pathways (i.e. the relative balance between paediatrics vs. mental health services) are likely to vary both by region (depending on the availability of specialist child and youth mental health services) and by age (with the role of the paediatrician decreasing as adolescence approaches). As paediatric outpatient data is currently not coded by diagnosis, the workload of community/developmental paediatricians in this context remains invisible, making it difficult to assess for children in particular, the underlying prevalence of mental health conditions in

the community. For adolescents/young adults however, the PRIMHD may provide a better reflection of access to secondary services for mental and behavioural issues.

Note 2: The PRIMHD records principal, secondary and provisional diagnoses for clients at each contact, although in a large number of cases the diagnosis was either missing or deferred. In this section, children/young people have been assigned a diagnosis, if they ever received this diagnosis (principal/secondary/provisional) in the period under review (i.e. numbers = total number of individuals receiving the diagnosis; rates = total number of individuals with the diagnosis divided by the number in the population at the mid-point of this period (i.e. 2010)). Contacts and bed-nights have then been ascribed to individuals with a particular diagnosis, irrespective of the reason the person sought care (e.g. contacts for ADHD = number of contacts for children ever diagnosed with ADHD (including those where the consultation related to another diagnoses), rather than the number of contacts specifically addressing ADHD issues. Where individuals were assigned multiple diagnoses (e.g. ADHD and a conduct disorder), they appear twice in the analysis. As a result, the figures in the tables which follow do not add to 100%, making it difficult to assess the contribution each diagnoses made to the total volume of services accessed during this period.

Note 3: In PRIMHD each diagnosis has a specified start and finish date. A number of children and young people accessing services during 2009–2011 however had a diagnosis with a specified start date which began in 2008, but which continued through the period under review. In addition, it is likely that a number of children and young people accessing services during 2009–2011 had their diagnosis deferred until early 2012, even though their care during 2009–2011 related to this diagnosis. Thus in this analysis, all children and young people have been included if they accessed mental health services during 2009–2011 (with year being determined by the service start date rather than the finish date). However, the diagnoses assigned to these children and young people have been drawn from PRIMHD diagnostic data with diagnosis start dates extending from mid-2008 to mid-2012.

Note 4: Where an individual accessed services on multiple occasions, and was thus recorded as having multiple ages, the mean age (averaged across the 3-year period) has been used, with the age being taken as the age of the patient at the activity start date. All activities for patients where their age at the activity start date was 25+ years have been excluded.

Further detail on the methodology used is available from the NZCYES on request.



ACCESS TO MENTAL HEALTH SERVICES IN CHILDREN AGED 0–14 YEARS

Introduction

The following section use data from the Project for the Integration of Mental Health Data (PRIMHD) to explore access to mental health outpatient, community and inpatient services for Māori children aged 0–14 years with the following mental health diagnoses:

- Attention deficit hyperactivity disorder (ADHD)
- Conduct/disruptive behaviour disorders
- Parent-child relational problems
- Autism/pervasive developmental disorders
- Learning disorders and intellectual disabilities

These diagnoses were selected as they were the most commonly assigned to children who were recorded as accessing mental health services in the PRIMHD.

Data Source and Methods

Information on the Project for the Integration of Mental Health Data (PRIMHD) and the DSM-IV codes used in this analysis is provided in the *Access to Mental Health Services: Introduction* section on **Page 183**.

Note 1: Because PRIMHD data is configured in a very different way to that contained in the National Minimum Dataset (hospital admissions) the reader is urged to review the methods section on **Page 183**, in order to become familiar with the strengths and limitations of PRIMHD.

Numbers Accessing Services

In New Zealand during 2009–2011, attention deficit hyperactivity disorder (ADHD) was the most frequent diagnosis assigned to Māori children accessing mental health services, followed by conduct/disruptive behaviour disorders and parent-child relational problems. In interpreting these figures it must be remembered that many children with these diagnoses access paediatric outpatient services, and that this workload is not captured by PRIMHD. Thus the rates given in **Table 53** are likely to underestimate the prevalence of these conditions in the community.

Numbers Accessing Services by Diagnosis and Ethnicity

In New Zealand during 2009–2011, the number of Māori children accessing mental health services with the diagnoses of ADHD, parent-child relational problems, autism/pervasive developmental disorders, or learning disorders were *significantly* lower than for non-Māori non-Pacific children, with similar ethnic differences being seen for mental health service contacts and inpatient bed nights.

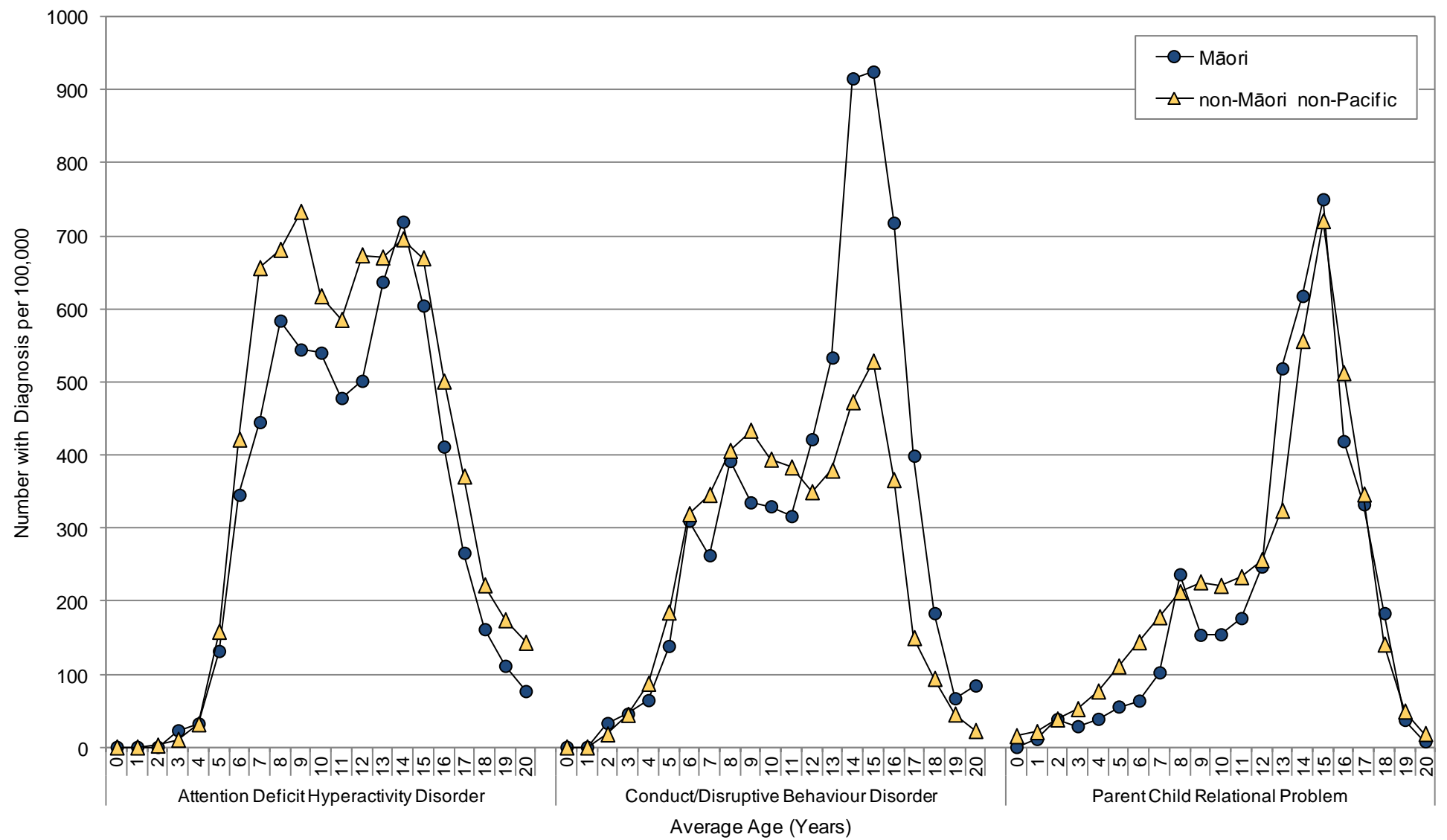
In contrast, the number of Māori children accessing mental health services with a diagnosis of conduct/disruptive behaviour disorder was similar to that of non-Māori non-Pacific and Māori children, although the number of mental health service contacts for Māori children with this diagnosis was *significantly* (albeit marginally) higher than for non-Māori non-Pacific children. Similarly, while the number of Māori children accessing mental health services with a diagnosis of an intellectual disability was similar to that of non-Māori non-Pacific and Māori children, the number of mental health service contacts and inpatient bed nights for Māori children with this diagnosis was *significantly* higher than for non-Māori non-Pacific children (**Table 53**).

Table 53. Children Aged 0–14 Years Accessing Mental Health Services with Attention Deficit Hyperactivity Disorder, Conduct/Disruptive Behaviour Disorders, Parent-Child Relational Problems, Autism/Pervasive Developmental Disorders, Learning Disorders and Intellectual Disabilities by Ethnicity, New Zealand 2009–2011

Ethnicity	Individuals				Contacts				Inpatient Bed Nights			
	Number: Total 2009–2011	Rate per 100,000	Rate Ratio	95% CI	Number: Annual Average	Rate per 100,000	Rate Ratio	95% CI	Number: Annual Average	Rate per 100,000	Rate Ratio	95% CI
Attention Deficit Hyperactivity Disorder												
Māori	691	299.89	0.75	0.69–0.82	9,267	4,021.8	0.84	0.82–0.86	92	39.78	0.19	0.15–0.23
non-Māori non-Pacific	2,306	400.19	1.00		27,622	4,793.6	1.00		1,215	210.91	1.00	
Conduct/Disruptive Behaviour Disorders												
Māori	571	247.81	0.96	0.87–1.06	8,205	3,560.7	1.06	1.03–1.08	218	94.61	0.96	0.82–1.12
non-Māori non-Pacific	1,482	257.19	1.00		19,415	3,369.3	1.00		567	98.40	1.00	
Parent-Child Relational Problem												
Māori	340	147.56	0.81	0.72–0.92	4,431	1,923.0	0.78	0.76–0.81	44	18.95	0.15	0.11–0.21
non-Māori non-Pacific	1,046	181.52	1.00		14,134	2,452.8	1.00		707	122.69	1.00	
Autism/Pervasive Developmental Disorders												
Māori	126	54.68	0.35	0.29–0.42	1,501	651.3	0.34	0.32–0.36	67	29.22	0.29	0.23–0.37
non-Māori non-Pacific	896	155.49	1.00		11,152	1,935.3	1.00		580	100.60	1.00	
Learning Disorders												
Māori	86	37.32	0.61	0.48–0.78	706	306.3	0.51	0.47–0.55	9	3.91	0.16	0.08–0.30
non-Māori non-Pacific	351	60.91	1.00		3,476	603.2	1.00		145	25.16	1.00	
Intellectual Disabilities												
Māori	76	32.98	0.95	0.73–1.23	1,041	451.9	1.34	1.24–1.44	40	17.22	2.27	1.48–3.49
non-Māori non-Pacific	201	34.88	1.00		1,944	337.4	1.00		44	7.58	1.00	

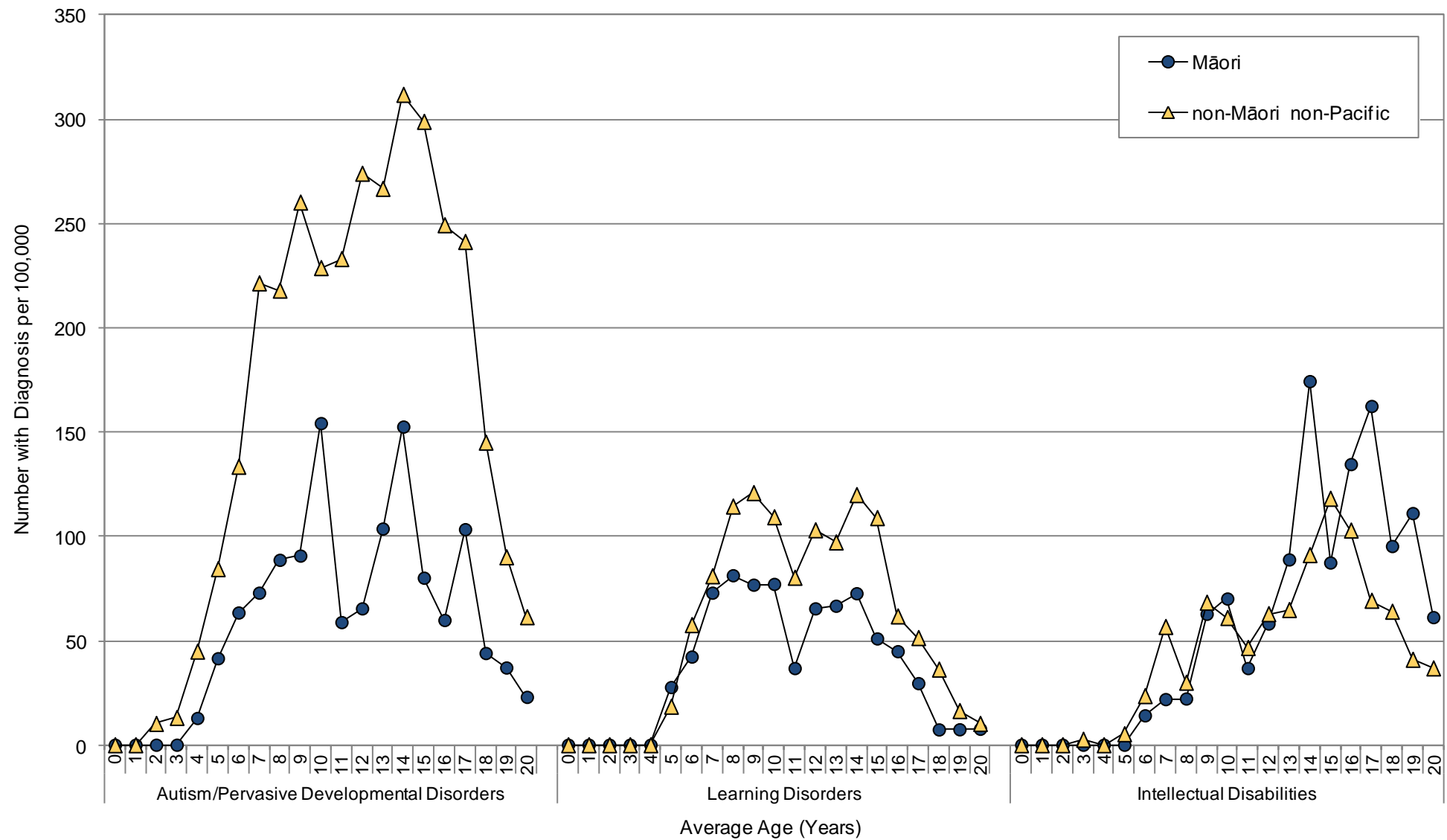
Source: PRIMHD; Note: *Individuals*: Total = total number of individuals with diagnosis accessing services during 2009–2011; Rate = number with diagnosis per 100,000 children 0–14 years (at midpoint of period (i.e. 2010)); *Contacts*: Annual Average = number of contacts each year (averaged over 2009–2011) with clients with this diagnosis; Rate = average number of contacts with clients with this diagnosis each year, per 100,000 children 0–14 years; *Inpatient Bed Nights*: Annual Average = number of bed nights each year (averaged over 2009–2011) for clients with this diagnosis; Rate = average number of bed nights for clients with this diagnosis each year, per 100,000 children 0–14 years

Figure 60. Children and Young People Accessing Mental Health Services with Attention Deficit Hyperactivity Disorder, Conductive/Disruptive Behaviour Disorders, or a Parent-Child Relational Problem by Ethnicity and Age, New Zealand 2009–2011



Source: Numerator: PRIMHD (individuals attending Mental Health Services who had ever been assigned these diagnoses); Denominator: Statistics NZ Projected Population (2010 = mid-point of 2009–2011)

Figure 61. Children and Young People Accessing Mental Health Services with Autism/Pervasive Developmental Disorders, Learning Disorders, or Intellectual Disabilities by Ethnicity and Age, New Zealand 2009–2011



Source: Numerator: PRIMHD (individuals attending Mental Health Services who had ever been assigned these diagnoses); Denominator: Statistics NZ Projected Population (2010 = mid-point of 2009–2011)

Numbers Accessing Services by Diagnosis, Age and Ethnicity

Attention Deficit Hyperactivity Disorder: In New Zealand during 2009–2011, the number of Māori children accessing mental health services with a diagnosis of ADHD increased rapidly during early to mid childhood, reached a peak at eight years of age and then declined briefly, before increasing again to reach a second peak at 14 years. Amongst non-Māori non-Pacific children, the number accessing services peaked at nine years of age, with a smaller peak also being evident at 14 years (**Figure 60**).

Conduct/Disruptive Behaviour Disorders: During 2009–2011, the number of Māori children accessing mental health services with a conduct/disruptive behaviour disorder increased rapidly between three and eight years of age and then remained relatively static until 11 years. Numbers then rose relatively rapidly to reach a peak at 15 years of age, before tapering off during the late teenage years. While similar patterns were seen for non-Māori non-Pacific children, access rates for non-Māori non-Pacific young people were lower than for Māori young people from 12 years of age onwards (**Figure 60**).

Parent-Child Relational Problems: During 2009–2011, the number of Māori children accessing mental health services with a parent-child relational problem increased rapidly between three and eight years of age and then remained relatively static until 11 years. Numbers then rose rapidly to a peak at 15 years, before tapering off again during the late teenage years. Similar patterns were seen for non-Māori non-Pacific children and young people (**Figure 60**).

Autism/Pervasive Developmental Disorders and Learning Disorders: During 2009–2011, the number of Māori children accessing mental health services with autism/pervasive developmental disorders increased rapidly between three and ten years of age. Rates then fluctuated during the early to mid teens, before declining amongst those in their late teens. At every age, from two years onwards, access rates for Māori were lower than for non-Māori non-Pacific children and young people. Similar patterns were seen for learning disorders (**Figure 61**).

Intellectual Disabilities: During 2009–2011, the number of Māori children accessing mental health services with intellectual disabilities increased from five years of age onwards, with rates reaching a peak at 14 years. Rates then fluctuated during the mid-teens before declining again amongst those in their late teens. While similar patterns were seen for non-Māori non-Pacific children, access rates for Māori young people in their late teens were generally higher than for non-Māori non-Pacific young people in the same age group (**Figure 61**).

New Zealand Distribution

Numbers Accessing Services by Diagnosis and Gender

In New Zealand during 2009–2011, the number of children aged 0–14 years accessing mental health services with diagnoses of ADHD, conduct/disruptive behaviour disorders, autism/pervasive developmental disorders, intellectual disabilities, learning disorders and parent-child relational problems was *significantly* higher for males than for females.

Local Policy Documents and Evidence-Based Reviews Relevant to Mental Health Issues in Children

The Determinants of Health for Children and Young People in New Zealand [4] provides a brief overview of local policy documents and evidence-based reviews relevant to mental health issues in children.

ACCESS TO MENTAL HEALTH SERVICES: LATE CHILDHOOD AND ADOLESCENCE

The following section uses data from the Project for the Integration of Mental Health Data (PRIMHD) to explore access to mental health outpatient, community and inpatient services for Māori children and young people with the following mental health diagnoses:

- Anxiety disorders
- Stress reaction/adjustment disorders
- Eating disorders

These diagnoses were selected as they were the most commonly assigned in late childhood and early adolescence to those recorded as accessing mental health services in the PRIMHD.

Data Source and Methods

Information on the Project for the Integration of Mental Health Data (PRIMHD) and the DSM-IV codes used in this analysis is provided in the *Access to Mental Health Services: Introduction* section on **Page 183**.

Note 1: Because PRIMHD data is configured in a very different way to that contained in the National Minimum Dataset (hospital admissions) the reader is urged to review the methods section on **Page 183**, in order to become familiar with the strengths and limitations of PRIMHD.

Numbers Accessing Services

In addition to the diagnoses reviewed in the section on access to mental health services for children, a number of mental health diagnoses became increasingly common during late childhood and early adolescence. During 2009–2011, these included anxiety disorders, stress reaction/adjustment disorders and eating disorders (**Table 54**). While it is likely that a number of Māori children and young people with these diagnoses would still have their care managed in the paediatric outpatient setting (with this workload not being captured by PRIMHD) the extent to which PRIMHD undercounts access to services for these children and young people may be less than in the previous section, due to the older age cohort involved (and the likelihood that mental health services rather than paediatric outpatients would be primarily responsible for their care).

Numbers Accessing Services by Diagnosis, Ethnicity and Gender

In New Zealand during 2009–2011, the number of Māori children and young people accessing mental health services with anxiety and eating disorders was *significantly* lower than for non-Māori non-Pacific children and young people. A similar pattern was seen for mental health service contacts and inpatient bed nights (**Table 54**).

While the number of Māori children and young people accessing mental health services with stress reaction/adjustment disorders was also *significantly* lower than for non-Māori non-Pacific children and young people, the number of mental health service contacts and inpatient bed nights for Māori children and young people with these diagnoses was *significantly* higher (**Table 54**).

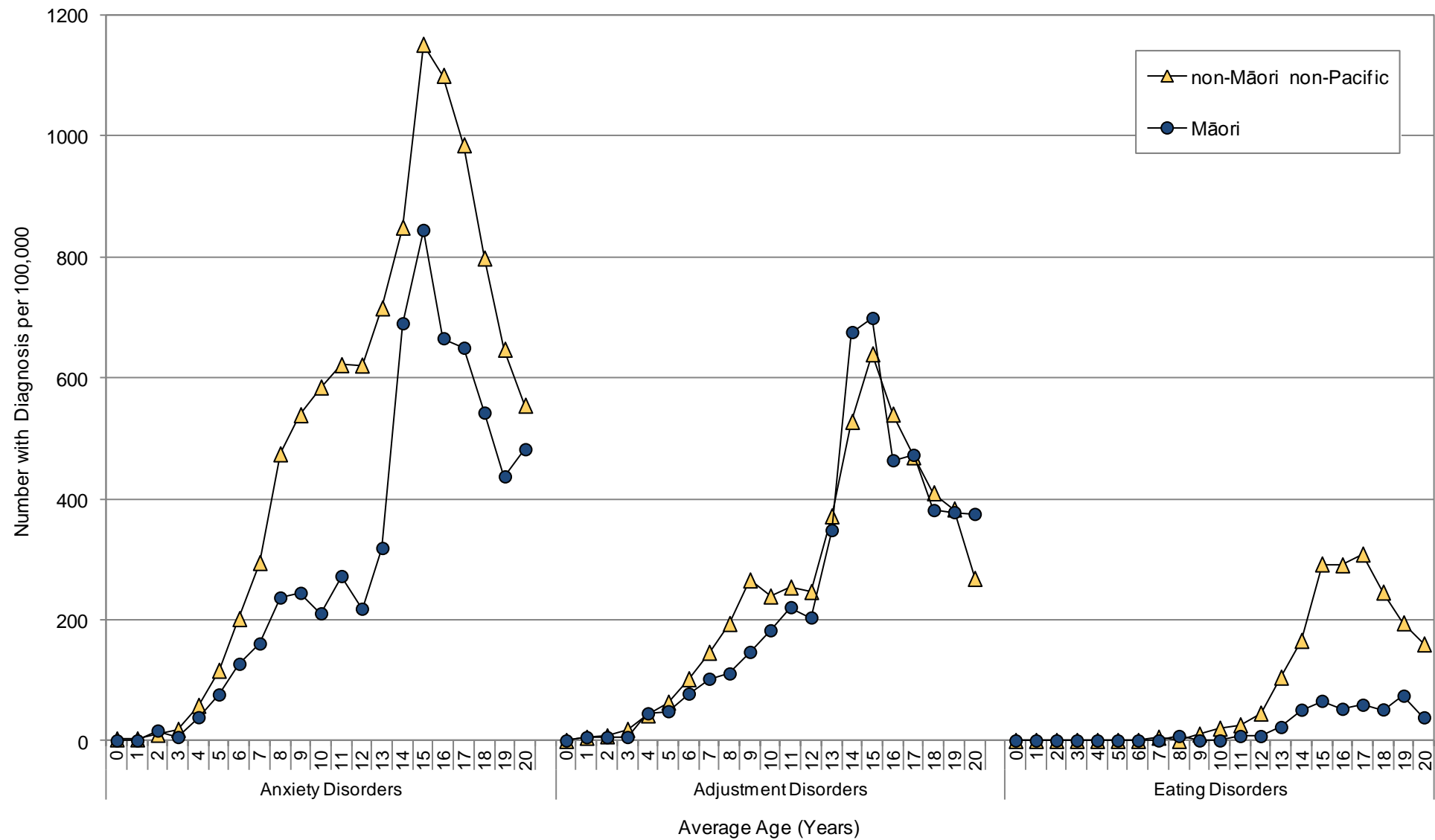


Table 54. Children and Young People Aged 0–24 Years Accessing Mental Health Services with Anxiety Disorders, Stress Reaction/Adjustment Disorders, and Eating Disorders by Ethnicity, New Zealand 2009–2011

Ethnicity	Individuals				Contacts				Inpatient Bed Nights			
	Number: Total 2009–2011	Rate per 100,000	Rate Ratio	95% CI	Number: Annual Average	Rate per 100,000	Rate Ratio	95% CI	Number: Annual Average	Rate per 100,000	Rate Ratio	95% CI
Anxiety Disorders												
Māori	1,120	314.06	0.57	0.54–0.61	24,550	6,884.2	0.76	0.75–0.77	4,798	1,345.3	0.90	0.88–0.93
non-Māori non-Pacific	5,629	548.26	1.00		92,763	9,034.9	1.00		15,274	1,487.6	1.00	
Stress Reaction/Adjustment Disorders												
Māori	832	233.30	0.87	0.81–0.94	12,067	3,383.6	1.06	1.04–1.08	1,967	551.7	1.19	1.13–1.25
non-Māori non-Pacific	2,740	266.87	1.00		32,739	3,188.8	1.00		4,774	465.0	1.00	
Eating Disorders												
Māori	74	20.75	0.19	0.15–0.24	1,759	493.3	0.19	0.18–0.20	477	133.8	0.19	0.18–0.21
non-Māori non-Pacific	1,118	108.89	1.00		27,037	2,633.3	1.00		7,095	691.0	1.00	

Source: PRIMHD; Note: *Individuals*: Total = total number of individuals with diagnosis accessing services during 2009–2011; Rate = number with diagnosis per 100,000 children and young people 0–24 years (at midpoint of period (i.e. 2010)); *Contacts*: Annual Average = number of contacts each year (averaged over 2009–2011) with clients with this diagnosis; Rate = average number of contacts with clients with this diagnosis each year, per 100,000 children and young people 0–24 years; *Inpatient Bed Nights*: Annual Average = number of bed nights each year (averaged over 2009–2011) for clients with this diagnosis; Rate = average number of bed nights for clients with this diagnosis each year, per 100,000 children and young people 0–24 years

Figure 62. Children and Young People Accessing Mental Health Services with Anxiety, Stress Reaction/Adjustment, or Eating Disorders by Ethnicity and Age, New Zealand 2009–2011



Source: Numerator: PRIMHD (individuals attending Mental Health Services who had ever been assigned these diagnoses); Denominator: Statistics NZ Projected Population (2010 = mid-point of 2009–2011)

Numbers Accessing Services by Diagnosis, Ethnicity and Age

Anxiety Disorders: In New Zealand during 2009–2011, the number of Māori children accessing mental health services with anxiety disorders increased between four and eight years of age. Rates then remained relatively static until twelve years, but then increased rapidly to reach a peak at 15 years of age. While similar patterns were seen for non-Māori non-Pacific children and young people, access rates for non-Māori non-Pacific children and young people with anxiety disorders were higher than for Māori children and young people at all ages, from three years onwards (**Figure 62**).

Stress Reaction/Adjustment Disorders: In New Zealand during 2009–2011, the number of Māori children accessing mental health services with stress reaction/adjustment disorders increased gradually between three and eleven years of age. Rates then remained relatively static until twelve years, but then increased rapidly to reach a peak at 15 years of age, before tapering off. Similar patterns were seen for non-Māori non-Pacific children and young people (**Figure 62**).

Eating Disorders: In New Zealand during 2009–2011, very few Māori children accessed mental health services with eating disorders prior to eleven years of age. Numbers then increased gradually during adolescence, to reach a plateau between 15 and 19 years. The number of Māori young people accessing mental health services with eating disorders however, was consistently lower than for non-Māori non-Pacific young people throughout the teenage years (**Figure 62**).

New Zealand Distribution

Numbers Accessing Services by Gender

In New Zealand during 2009–2011, the number of children and young people accessing mental health services with anxiety, stress reaction/adjustment and eating disorders were all *significantly* higher for females than for males.

Local Policy Documents and Evidence-Based Reviews Relevant to Mental Health Issues in Children and Young People

The Determinants of Health for Children and Young People in New Zealand [4] provides a brief overview of local policy documents and evidence-based reviews relevant to mental health issues in children and young people.

ACCESS TO MENTAL HEALTH SERVICES: LATE ADOLESCENCE

The following section uses the National Minimum Dataset to explore the most common reasons for hospitalisation with a mental health diagnosis in Māori young people aged 15–24 years. In this section, the unit of analysis is the number of hospital admissions, rather than the number of individuals accessing services, with the coding system used to assign diagnoses being ICD-10-AM.

In addition, data from the Project for the Integration of Mental Health Data (PRIMHD) is used to explore access to mental health outpatient, community and inpatient services in young people with the following diagnoses:

- Schizophrenia and other psychotic disorders
- Personality disorders
- Depression, bipolar disorder and other mood disorders
- Substance-related disorders (alcohol, cannabis, and other substances).

These diagnoses were selected as they were the most commonly assigned to young who were recorded as accessing mental health services in the PRIMHD. In this second section, the units of analysis are the number of young people accessing services, and the number of contacts and inpatient bed nights, with the coding system used to assign diagnoses being DSM-IV.



Data Source and Methods

Information on the Project for the Integration of Mental Health Data (PRIMHD) and the DSM-IV codes used in this analysis is provided in the Access to Mental Health Services: Introduction section on **Page 286**.

Note 1: Because PRIMHD data is configured in a very different way to that contained in the National Minimum Dataset (hospital admissions) the reader is urged to review the methods section on **Page 286**, in order to become familiar with the strengths and limitations of PRIMHD.

In addition, the section below provides additional information on the National Minimum Dataset, which has been used to review mental health inpatient admissions for those aged 15–24 years.

Definition

Hospital admissions for young people aged 15–24 years with an ICD-10-AM mental health diagnosis

Data Source

Numerator: National Minimum Dataset: Hospital admissions in young people aged 15–24 years with a *primary diagnosis* of a Mental or Behavioural Disorder (ICD-10-AM F00–F99). Admissions with an Emergency Medicine specialty code in the range M05–M08 on discharge were excluded. Specific diagnoses included ICD-10-AM F10 or Z72.1 (Mental Health Issues due to Alcohol or Alcohol Use); F12 (Mental Health Issues due to Cannabis Use); F17 or Z72.0 (Mental Health Issues due to Tobacco or Tobacco Use); F11, F13, F14, F15, F16, F18, F19 or Z72.2 (Mental Health Issues due to Other Specified Drugs); F20 (Schizophrenia); F21–F29 (Schizotypal/Delusional Disorders); F31 (Bipolar Affective Disorder); F32 or F33 (Depression); F30, F34, F38, or F39 (Other Mood Disorders); F40 or F41 (Anxiety Disorders); F42 (Obsessive Compulsive Disorder); F43 (Stress Reaction/Adjustment Disorder); F50 (Eating Disorders); F60–F69 (Personality/Behaviour Disorders).

Denominator: Statistics NZ Projected Population

Notes on Interpretation

Note 1: The limitations of the National Minimum Dataset are discussed in **Appendix 2**. The reader is urged to review this Appendix before interpreting any analyses based on hospital admission data. In particular, due to inconsistent uploading of Emergency Department (ED) cases to the NMDS, all admissions with an ED health specialty code on discharge have been excluded (see **Appendix 2** for a more detailed discussion).

Note 2: Whereas the inpatient data derived from PRIMHD refers to the number of bed nights utilised by young people with various mental health diagnoses, the section on mental health inpatient admissions uses hospital admissions as the unit of analysis (i.e. a hospital admission is counted only once, irrespective of the number of bed nights utilised, with the same client potentially being counted several times, if they are admitted on a number of occasions with a mental health diagnosis).

Note 3: For hospital admission data, only the primary diagnosis has been used (vs. PRIMHD data, where a client with more than one diagnosis may appear several times in conjunction with each of the diagnoses received). In addition, in the National Minimum Dataset, all mental health diagnoses were coded in ICD-10-AM, whereas PRIMHD data was provided by the Ministry with diagnoses coded in DSM-IV. Thus the two analyses are not strictly comparable.

Hospital Admissions for Māori Young People with ICD-10-AM Mental Health Diagnoses

In New Zealand during 2007–2011, the most common reasons for hospital admissions with mental health diagnoses in Māori young people were for schizophrenia, followed by schizotypal/delusional disorders. Composite categories such as drug and alcohol-related conditions also made a significant contribution (**Table 55**).

Table 55. Hospital Admissions for Mental Health Conditions in Young People Aged 15–24 Years by Ethnicity and Primary Diagnosis, New Zealand 2007–2011

ICD-10-AM Diagnosis	Number: Total 2007–2011	Number: Annual Average	Rate per 100,000	Percent of Admissions (%)
Māori Young People 15–24 Years				
Schizophrenia	1,442	288.4	232.76	31.4
Schizotypal/Delusional Disorders	985	197.0	159.00	21.5
Depression	427	85.4	68.93	9.3
Bipolar Affective Disorder	335	67.0	54.07	7.3
Other Mood Disorders	107	21.4	17.27	2.3
Alcohol/Drug Mental Health Effects	515	103.0	83.13	11.2
Stress Reaction/Adjustment Disorder	356	71.2	57.46	7.8
Personality Disorders	119	23.8	19.21	2.6
Anxiety Disorders	35	7.0	5.65	0.8
Eating Disorders	16	3.2	2.58	0.3
Other Mental Health Issues	252	50.4	40.68	5.5
Māori Total	4,589	917.8	740.75	100.0
non-Māori non-Pacific Young People 15–24 Years				
Schizophrenia	983	196.6	43.92	10.9
Schizotypal/Delusional Disorders	1,129	225.8	50.45	12.6
Depression	1,692	338.4	75.60	18.8
Bipolar Affective Disorder	750	150.0	33.51	8.3
Other Mood Disorders	280	56.0	12.51	3.1
Alcohol/Drug Mental Health Effects	985	197.0	44.01	11.0
Stress Reaction/Adjustment Disorder	852	170.4	38.07	9.5
Obsessive Compulsive Disorder	45	9.0	2.01	0.5
Anxiety Disorders	253	50.6	11.30	2.8
Personality Disorders	582	116.4	26.01	6.5
Eating Disorders	738	147.6	32.98	8.2
Other Mental Health Issues	703	140.6	31.41	7.8
non-Māori non-Pacific Total	8,992	1,798.4	401.78	100.0

Source: Numerator: NMDS; Denominator: Statistics NZ Projected Population; Note: ED cases removed

Access to Mental Health Services (PRIMHD Data)

Numbers Accessing Services

In addition to the diagnoses reviewed in the earlier sections on access to mental health services during childhood and early adolescence, a number of mental health diagnoses became increasingly common during late adolescence. During 2009–2011, these included schizophrenia and other psychotic disorders, depression, bipolar disorder and other mood disorders and personality disorders (**Table 56**). When compared to the paediatric population, it is likely that very few Māori young people with these diagnoses would have their care managed primarily in the paediatric outpatient setting (which is not captured by PRIMHD) and thus the extent to which PRIMHD undercounts access to services for Māori young people with these diagnosis is likely to be less than in the previous sections.

Numbers Accessing Services by Diagnosis and Ethnicity

In New Zealand during 2009–2011, the number of Māori young people accessing mental health services with schizophrenia and other psychotic disorders, and bipolar disorder was *significantly* higher than for non-Māori non-Pacific young people. Similar patterns were seen for mental health service contacts and inpatient bed nights (**Table 56**).

In contrast, the number of Māori young people accessing mental health services with depression and other mood disorders was *significantly* lower than for non-Māori non-Pacific young people. While similar patterns were seen for mental health service contacts, the number of inpatient bed nights accessed by Māori young people with depression was *significantly* higher than for non-Māori non-Pacific young people, while the number of inpatient bed nights accessed by Māori young people with other mood disorders was *significantly* lower (**Table 56**).

The number of Māori young people accessing mental health services with a personality disorder however, was not *significantly* different from that of non-Māori non-Pacific young people. While similar patterns were seen for the number of mental health service contacts, the number of inpatient bed nights was *significantly* higher for Māori young people with personality disorders than for non-Māori non-Pacific young people (**Table 56**).

Numbers Accessing Services by Diagnosis and Age

Schizophrenia and Other Psychotic Disorders, and Personality Disorders: In New Zealand during 2009–2011, the number of Māori young people accessing mental health services with schizophrenia and other psychotic disorders increased rapidly after 12 or 13 years of age, while the number accessing services with personality disorders increased after 14 years. For all three diagnoses, the number of young people accessing services continued to increase up until 20 years, with access rates for Māori young people with schizophrenia and other psychotic disorders being higher than for non-Māori non-Pacific young people during their teenage years, while access rates for those with personality disorders were similar for both ethnic groups (**Figure 63**).

Depression, Bipolar Disorder and Other Mood Disorders: In New Zealand during 2009–2011, the number of Māori young people accessing mental health services with a diagnosis of depression increased rapidly between eleven and fifteen years of age, with numbers then remaining relatively static until 17 years, before decreasing again. Access rates for Māori young people with depression however, were consistently lower than for non-Māori non-Pacific young people from 14 years of age onwards. A similar pattern (albeit at a lower baseline rate) was seen for other mood disorders. In contrast, the number of Māori young people accessing mental health services with a diagnosis of bipolar disorder increased gradually from twelve years of age onwards, with access rates being similar for Māori and non-Māori non-Pacific young people (**Figure 64**).

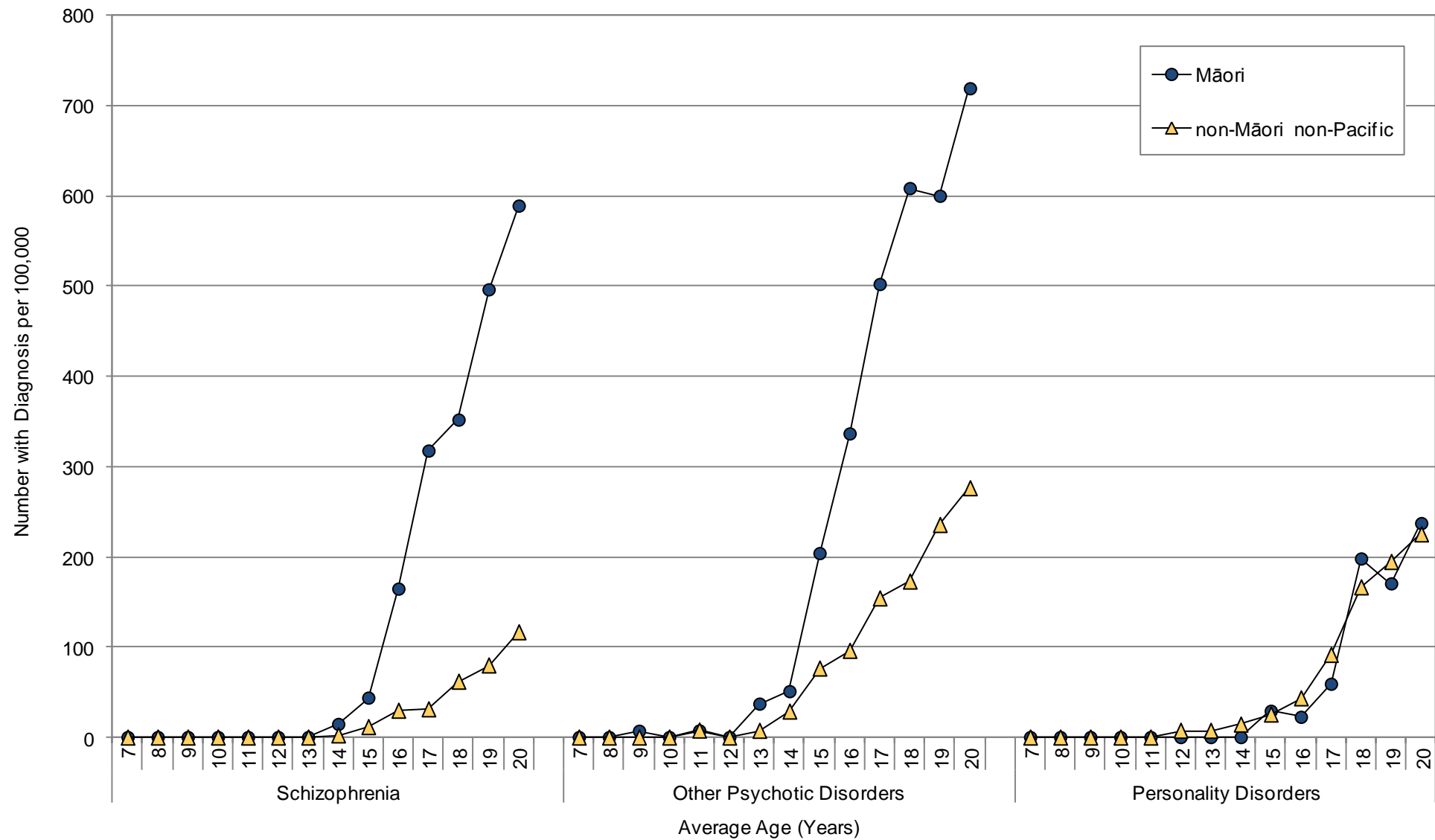


Table 56. Young People Aged 15–24 Years Accessing Mental Health Services with Schizophrenia and Other Psychotic Disorders, Depression, Bipolar Disorder and Other Mood Disorders, and Personality Disorders by Ethnicity, New Zealand 2009–2011

Ethnicity	Individuals				Contacts				Inpatient Bed Nights			
	Number: Total 2009–2011	Rate per 100,000	Rate Ratio	95% CI	Number: Annual Average	Rate per 100,000	Rate Ratio	95% CI	Number: Annual Average	Rate per 100,000	Rate Ratio	95% CI
Schizophrenia												
Māori	695	550.7	4.40	3.94–4.91	45,982	36,435.8	4.98	4.92–5.04	28,644	22,697.6	4.80	4.72–4.88
non-Māori non-Pacific	564	125.2	1.00		32,965	7,317.8	1.00		21,314	4,731.5	1.00	
Other Psychotic Disorders												
Māori	772	611.7	2.49	2.27–2.73	44,203	35,025.9	3.44	3.40–3.48	21,004	16,643.7	3.59	3.52–3.65
non-Māori non-Pacific	1,106	245.5	1.00		45,814	10,170.1	1.00		20,908	4,641.3	1.00	
Depression												
Māori	1,239	981.8	0.80	0.76–0.85	24,583	19,479.7	0.97	0.95–0.98	7,335	5,812.5	1.49	1.45–1.53
non-Māori non-Pacific	5,500	1,220.9	1.00		90,907	20,180.0	1.00		17,598	3,906.5	1.00	
Bipolar Disorder												
Māori	275	217.9	1.23	1.07–1.41	10,672	8,456.2	1.67	1.63–1.70	6,349	5,030.6	2.65	2.57–2.74
non-Māori non-Pacific	800	177.6	1.00		22,872	5,077.2	1.00		8,537	1,895.2	1.00	
Other Mood Disorders												
Māori	224	177.5	0.75	0.65–0.87	4,805	3,807.7	0.82	0.80–0.85	1,213	961.2	0.76	0.72–0.81
non-Māori non-Pacific	1,062	235.8	1.00		20,817	4,621.0	1.00		5,681	1,261.2	1.00	
Personality Disorders												
Māori	226	179.1	0.89	0.77–1.03	9,563	7,577.4	1.00	0.98–1.02	4,784	3,791.1	1.57	1.52–1.62
non-Māori non-Pacific	905	200.9	1.00		34,240	7,600.8	1.00		10,892	2,417.8	1.00	

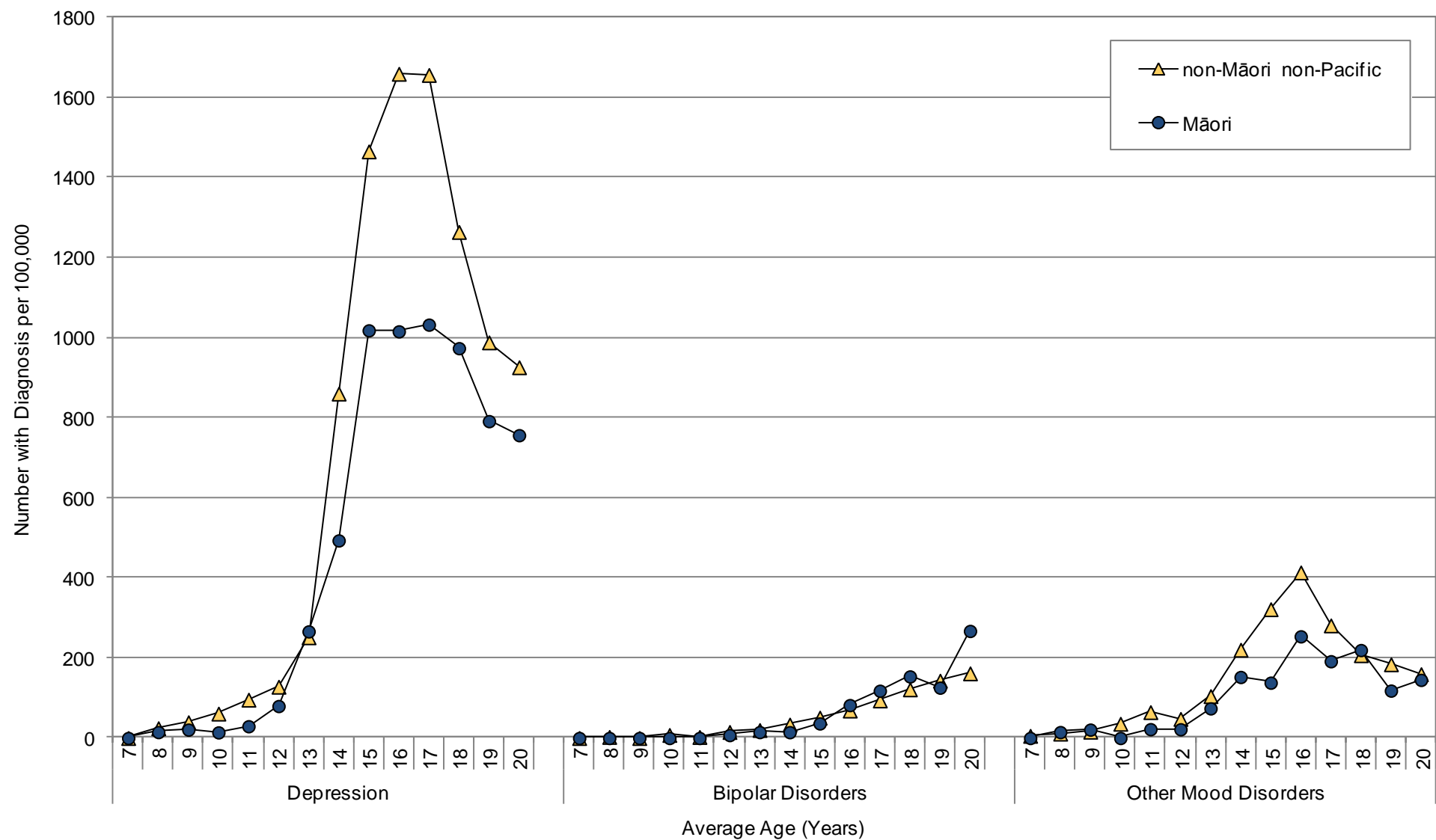
Source: PRIMHD; Note: *Individuals*: Total = total number of individuals with diagnosis accessing services during 2009–2011; Rate = number with diagnosis per 100,000 young people 15–24 years (at midpoint of period (i.e. 2010)); *Contacts*: Annual Average = number of contacts each year (averaged over 2009–2011) with clients with this diagnosis; Rate = average number of contacts with clients with this diagnosis each year, per 100,000 young people 15–24 years; *Inpatient Bed Nights*: Annual Average = number of bed nights each year (averaged over 2009–2011) for clients with this diagnosis; Rate = average number of bed nights for clients with this diagnosis each year, per 100,000 young people 15–24 years

Figure 63. Children and Young People Accessing Mental Health Services with Schizophrenia, Other Psychotic Disorders or Personality Disorders by Ethnicity and Age, New Zealand 2009–2011



Source: Numerator: PRIMHD (individuals attending Mental Health Services who had ever been assigned these diagnoses); Denominator: Statistics NZ Projected Population (2010 = mid-point of 2009–2011)

Figure 64. Children and Young People Accessing Mental Health Services with Depression, Bipolar Disorder or Other Mood Disorders by Ethnicity and Age, New Zealand 2009–2011



Source: Numerator: PRIMHD (individuals attending Mental Health Services who had ever been assigned these diagnoses); Denominator: Statistics NZ Projected Population (2010 = mid-point of 2009–2011)

New Zealand Distribution

Numbers Accessing Services by Diagnosis and Gender

In New Zealand during 2009–2011, the number of young people accessing mental health services with schizophrenia or other psychotic disorders was *significantly* higher for males, while the number accessing mental health services with depression, bipolar disorder and other mood disorders, and for personality disorders was *significantly* higher for females.

Local Policy Documents and Evidence-Based Reviews Relevant to Mental Health Issues in Young People

The Determinants of Health for Children and Young People in New Zealand [4] provides a brief overview of local policy documents and evidence-based reviews relevant to mental health issues in young people.

Mental Health Issues Associated with Substance Use

Distribution by Ethnicity

In New Zealand during 2009–2011, the number of Māori young people accessing mental health services with alcohol-related, cannabis-related and other substance-related disorders was *significantly* higher than for non-Māori non-Pacific young people. Similar patterns were seen for mental health contacts and inpatient bed nights (**Table 57**).

Access to Services by Ethnicity and Age

In New Zealand during 2009–2011, the number of Māori young people accessing mental health services for mental health issues associated with alcohol, cannabis or other substance use, or where substance use was recorded as a co-diagnosis, increased rapidly after 12 years of age, with access rates being higher for Māori than for non-Māori non-Pacific young people from thirteen years of age onwards (**Figure 65**).

Note: As a result of the considerable overlap between mental health diagnoses and substance use, it is likely that a proportion of the mental health contacts and inpatient bed nights presented in the tables which follow actually occurred in the context of care for other diagnoses, rather than primarily for the management of a substance-related disorder.

New Zealand Distribution

Distribution by Gender

In New Zealand during 2009–2011, the number of young people accessing mental health services with alcohol-related, cannabis-related and other substance-related disorders was *significantly* higher for males than for females.

Mental Health Issues with Substance Use as a Co-Diagnosis

In New Zealand during 2009–2011, substance use was a very frequent co-diagnosis for children and young people accessing mental health services. Personality disorders, followed by schizophrenia and other psychotic disorders were the most frequent diagnoses to have an alcohol-related disorder listed as a co-diagnosis, while schizophrenia, other psychotic disorders, and then personality disorders, were the most frequent diagnoses to have cannabis use, or other substance use listed as a co-diagnosis. Amongst those with schizophrenia 19.8% had an alcohol-related disorder listed as a co-diagnosis, while 26.6% had a cannabis-related disorder, and 21.3% had other substance use listed as a co-diagnosis.

Age Distribution of those Accessing Services with Substance-Related Disorders and Schizophrenia and Other Psychotic Disorders

While there was considerable overlap in the number of young people diagnosed with substance-related disorders and schizophrenia and other psychotic disorders, the age-related increases in the numbers diagnosed with alcohol and cannabis-related disorders occurred around two to three years earlier than the age-related increase in the number of young people diagnosed with schizophrenia.

Local Policy Documents and Evidence-Based Reviews Relevant to Substance Use in Young People

The Determinants of Health for Children and Young People in New Zealand [4] provides a brief overview of local policy documents and evidence-based reviews relevant to substance use in young people.

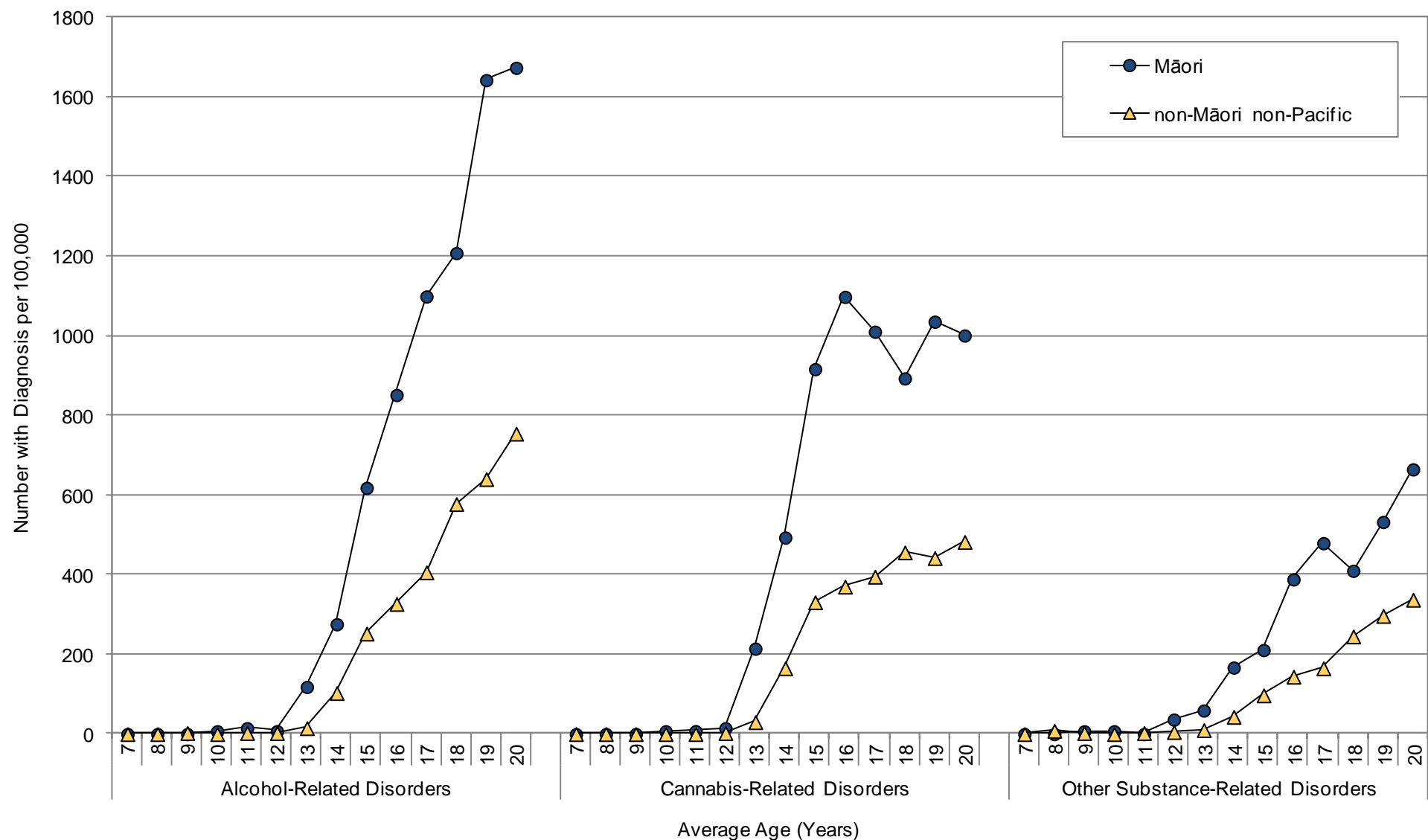


Table 57. Young People Aged 15–24 Years Accessing Mental Health Services with Alcohol, Cannabis or Other Substance-Related Disorders by Ethnicity, New Zealand 2009–2011

Ethnicity	Individuals				Contacts				Inpatient Bed Nights			
	Number: Total 2009–2011	Rate per 100,000	Rate Ratio	95% CI	Number: Annual Average	Rate per 100,000	Rate Ratio	95% CI	Number: Annual Average	Rate per 100,000	Rate Ratio	95% CI
Alcohol-Related Disorders												
Māori	1,837	1,455.6	2.34	2.21–2.48	31,438	24,911.3	2.96	2.92–3.00	12,048	9,547.0	3.71	3.62–3.80
non-Māori non-Pacific	2,800	621.6	1.00		37,880	8,408.7	1.00		11,597	2,574.4	1.00	
Cannabis-Related Disorders												
Māori	1,313	1,040.4	2.34	2.18–2.51	34,513	27,347.9	3.56	3.51–3.60	17,716	14,037.8	5.07	4.96–5.18
non-Māori non-Pacific	2,004	444.9	1.00		34,651	7,691.9	1.00		12,471	2,768.4	1.00	
Other Substance-Related Disorders												
Māori	758	600.6	1.92	1.75–2.09	27,271	21,609.6	2.91	2.86–2.95	13,903	11,016.6	4.72	4.61–4.84
non-Māori non-Pacific	1,412	313.4	1.00		33,492	7,434.8	1.00		10,514	2,334.0	1.00	

Source: PRIMHD; Note: *Individuals*: Total = total number of individuals with diagnosis accessing services during 2009–2011; Rate = number with diagnosis per 100,000 young people 15–24 years (at midpoint of period (i.e. 2010)); *Contacts*: Annual Average = number of contacts each year (averaged over 2009–2011) with clients with this diagnosis; Rate = average number of contacts with clients with this diagnosis each year, per 100,000 young people 15–24 years; *Inpatient Bed Nights*: Annual Average = number of bed nights each year (averaged over 2009–2011) for clients with this diagnosis; Rate = average number of bed nights for clients with this diagnosis each year, per 100,000 young people 15–24 years; **Substance use may be a comorbidity rather than primary reason for accessing services**

Figure 65. Children and Young People Accessing Mental Health Services with Mental Health Issues Associated with Substance Use by Ethnicity and Age, New Zealand 2009–2011



Source: Numerator: PRIMHD (individuals attending Mental Health Services who had ever been assigned these diagnoses); Denominator: Statistics NZ Projected Population (2010 = mid-point of 2009–2011)

SUICIDE AND INTENTIONAL SELF-HARM

Introduction

The following section uses information from the National Minimum Dataset and the National Mortality Collection to review hospital admissions for intentional self-harm and mortality from suicide in Māori young people aged 15–24 years.

Background

In New Zealand during 2009, suicide was the second most common cause of death after motor vehicle accidents for young people aged 15 to 24 years [142]. Although rates have declined since the late 1990s, youth suicide rates remain high compared to other OECD countries and prevention of youth suicide remains an important focus [143].

In terms of prevalence, Māori young people are at a substantially higher risk of suicide than non-Māori young people. In 2009, the rate of suicide among Māori young people was over 80% higher than for non-Māori young people (28.7 and 15.6 per 100,000 population respectively) [142]. While hospitalisation rates for intentional self-harm dropped markedly for non-Māori between 1996 and 2006, rates for Māori remained stable, thereby increasing disparities between Māori and non-Māori during this period [142]. The Youth '07 survey of 9,107 secondary school students in 2007 also found that 25.3% (95% CI 22.8 to 27.7) of Māori students reported deliberately harming themselves in the preceding 12 months, compared to 19.4% (95% CI 17.9 to 20.8) of European students [138]. Suicidal thoughts, plans and attempts were all reported more commonly among Māori than European students.

In terms of its aetiology, suicidal behaviour in young people is thought to result from an accumulation of risk factors which may include childhood and family adversity, individual vulnerabilities, mental disorders including depression and substance abuse, non-heterosexual sexual orientation, exposure to suicidal behaviour by others, and exposure to stressors and adverse circumstances [144,145]. Te Rau Hinengaro, The New Zealand Mental Health Survey found that the risk of suicidal ideation, a suicide plan, or a suicide attempt were also significantly higher in young people, compared to those aged over 25 years [140]. The risk of suicidal behaviours was also increased in those with low household incomes and those living in deprived areas [140]. Socioeconomic disadvantage and child welfare care are also associated with higher suicide rates among young people in New Zealand [146,147]. A caring parent or other family member and a fair, safe school environment however, appear to be protective against suicide attempts [145].

Data Source and Methods

Definition

1. Hospital admissions for injuries arising from intentional self-harm in young people aged 15–24 years
2. Mortality from suicide in young people aged 15–24 years

Data Source

1. Hospital Admissions

Numerator: National Minimum Dataset: Hospital admissions for young people aged 15–24 years with a primary diagnosis of injury (ICD-10-AM S00–T79) and an external cause code (e-code) of intentional self-harm (ICD-10-AM X60–X84); Admissions with an Emergency Medicine specialty code (M05–M08) on discharge were excluded (see **Appendix 2**).

2. Mortality

Numerator: National Mortality Collection: Deaths of young people aged 15–24 years with a main underlying cause of death of intentional self-harm (ICD-10-AM X60–X84)

Denominator: Statistics NZ Estimated Resident Population (projected from 2007)

Notes on Interpretation

The limitations of the National Minimum Dataset are discussed at length in **Appendix 2**

Distribution in Māori Young People

Distribution by Ethnicity

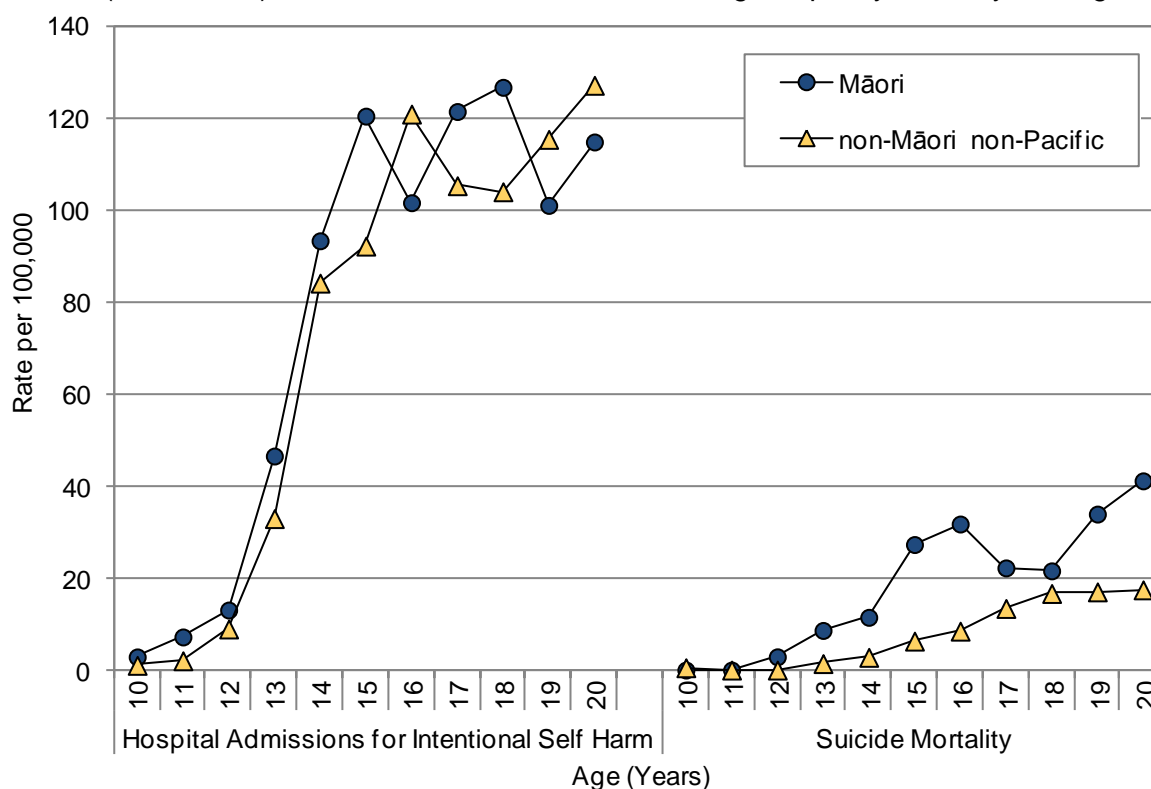
In New Zealand during 2007–2011, hospital admissions for intentional self-harm were *significantly* higher for Māori than for non-Māori non-Pacific young people, although the magnitude of these differences was not large. On average, there were 143 hospital admissions for intentional self-harm each year amongst Māori young people during this period (**Table 58**). During 2005–2009, suicide mortality rates were also *significantly* higher for Māori than for non-Māori non-Pacific young people, with on average 36 Māori young people each year dying as a result of suicide during this period (**Table 58**).

Table 58. Hospital Admissions for Intentional Self-Harm (2007–2011) and Mortality from Suicide (2005–2009) in New Zealand Young People Aged 15–24 Years by Ethnicity

Intentional Self-Harm Admissions in Young People 15–24 Years					
Ethnicity	Number: Total 2007–2011	Number: Annual Average	Rate per 100,000	Rate Ratio	95% CI
Māori	714	142.8	115.25	1.12	1.03–1.21
non-Māori non-Pacific	2,312	462.4	103.31	1.00	
Suicide Mortality in Young People 15–24 Years					
Ethnicity	Number: Total 2005–2009	Number: Annual Average	Rate per 100,000	Rate Ratio	95% CI
Māori	180	36.0	30.25	2.11	1.75–2.53
non-Māori non-Pacific	317	63.4	14.37	1.00	

Source: Numerators: National Minimum Dataset and National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: Rate Ratios are unadjusted

Figure 66. Hospital Admissions for Intentional Self-Harm (2007–2011) and Mortality from Suicide (2005–2009) in New Zealand Children and Young People by Ethnicity and Age



Source: Numerators: National Minimum Dataset and National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population (projected from 2007)

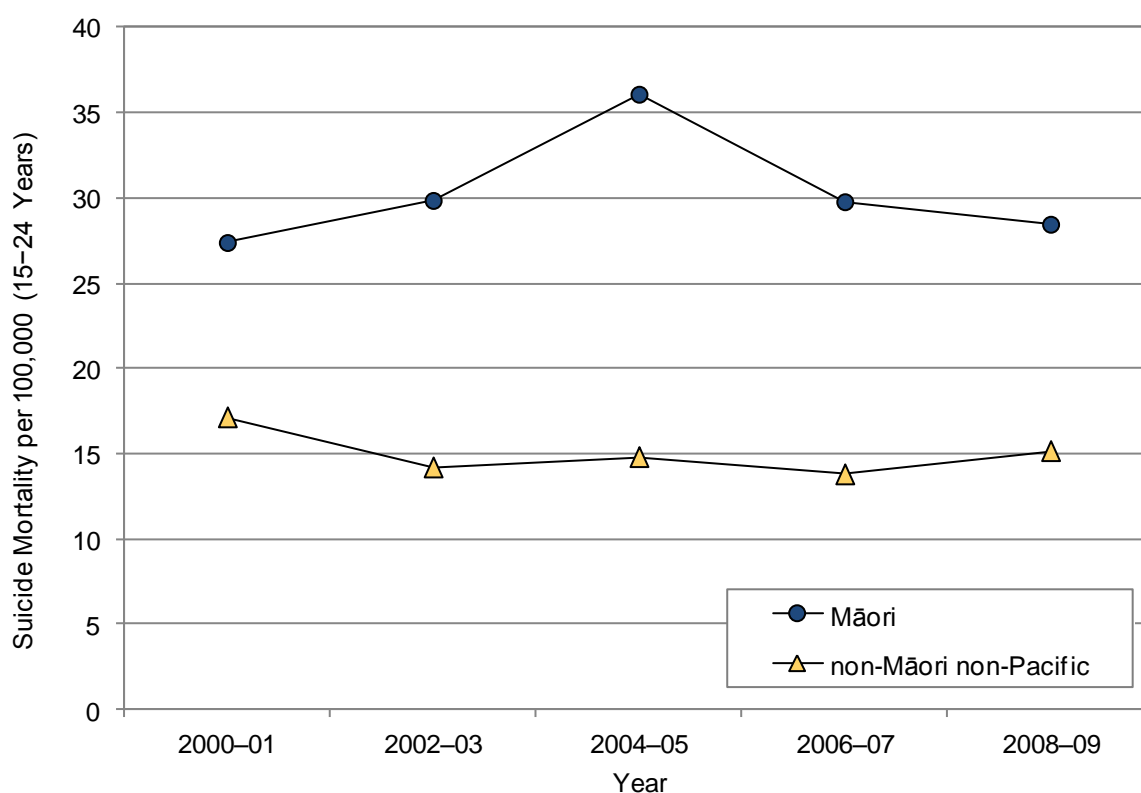
Distribution by Ethnicity and Age

In New Zealand during 2007–2011, hospital admissions for intentional self-harm increased rapidly after 12 years of age, with the highest rates being seen amongst those in their mid to late teens. During this period, the distribution by age was very similar for Māori and non-Māori non-Pacific young people. In contrast, mortality from suicide during 2005–2009 increased more slowly during the teenage years, with the highest rates being seen amongst those in their late teens. At every age from 12 years onwards, suicide mortality was higher for Māori than for non-Māori non-Pacific young people (**Figure 66**).

Trends by Ethnicity

In New Zealand during 2000–2009, suicide mortality was consistently higher for Māori than for non-Māori non-Pacific young people. Mortality rates for Māori young people increased during the early 2000s, reached a peak in 2004–05 and then declined, while rates for non-Māori non-Pacific young people were more static (**Figure 67**).

Figure 67. Mortality from Suicide in Young People Aged 15–24 Years by Ethnicity, New Zealand 2000–2009



Source: Numerator: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population (projected from 2007)

New Zealand Distribution and Trends

New Zealand Trends in Suicide Mortality

In New Zealand during 2000–2009, suicide rates in young people aged 15–24 years remained relatively static. On average during this period, 107 New Zealand young people each year died as the result of suicide.

Distribution by Gender

In New Zealand during 2007–2011, hospital admissions for intentional self-harm were *significantly* higher for females than for males. Admissions for females increased rapidly after 12 years of age, reached a peak at 16 years and then declined. Admission rates for males increased more slowly during the teenage years, and were lower than for females at all ages from 12 years onwards.

In contrast, during 2005–2009 suicide mortality rates were *significantly* higher for males than for females. While mortality also increased during the teenage years, rates were higher for males than for females from 15 years of age onwards.

Local Policy Documents and Evidence-Based Reviews Relevant to the Prevention of Suicide and Intentional Self-Harm

The Determinants of Health for Children and Young People in New Zealand [4] provides a brief overview of local policy documents and evidence-based reviews relevant to the prevention of suicide and intentional self-harm in young people.





APPENDICES AND REFERENCES

APPENDIX 1: 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%) [148].

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) [148].

The Use of Statistical Significance Testing in this Report

In the preparation of this report a large range of data sources were 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 (i.e. the word *significant* in italics is used to imply that a test of statistical significance has been applied to the data and that the significance of the associations is as indicated). 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 [149] 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 SIDS in New Zealand is 10 times higher in the most deprived NZDep areas might be used to make inferences about the impact of the socioeconomic environment on SIDS mortality 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 2005–2009, 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 [149].

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 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 2: THE NATIONAL MINIMUM DATASET

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 [7]. 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, with a view to predicting future health service demand, and planning new services and interventions. However, there are a number of issues which must be taken 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 5**, 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 [150].

Admissions which 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 [151]. 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

In New Zealand, there is considerable variation in the way DHBs report their ED day cases to the NMDS. Such variations have included:

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 those events whose treatment time exceeded 3 hours [151]. 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 consistently reporting their ED cases 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 which 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 [152], 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 [153], 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 [154] 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, paediatric assessment units 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. Thus 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 [155], 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, paediatric assessment unit, 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, which alerts readers to these issues, so that any 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 more 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, the filtering out of 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.

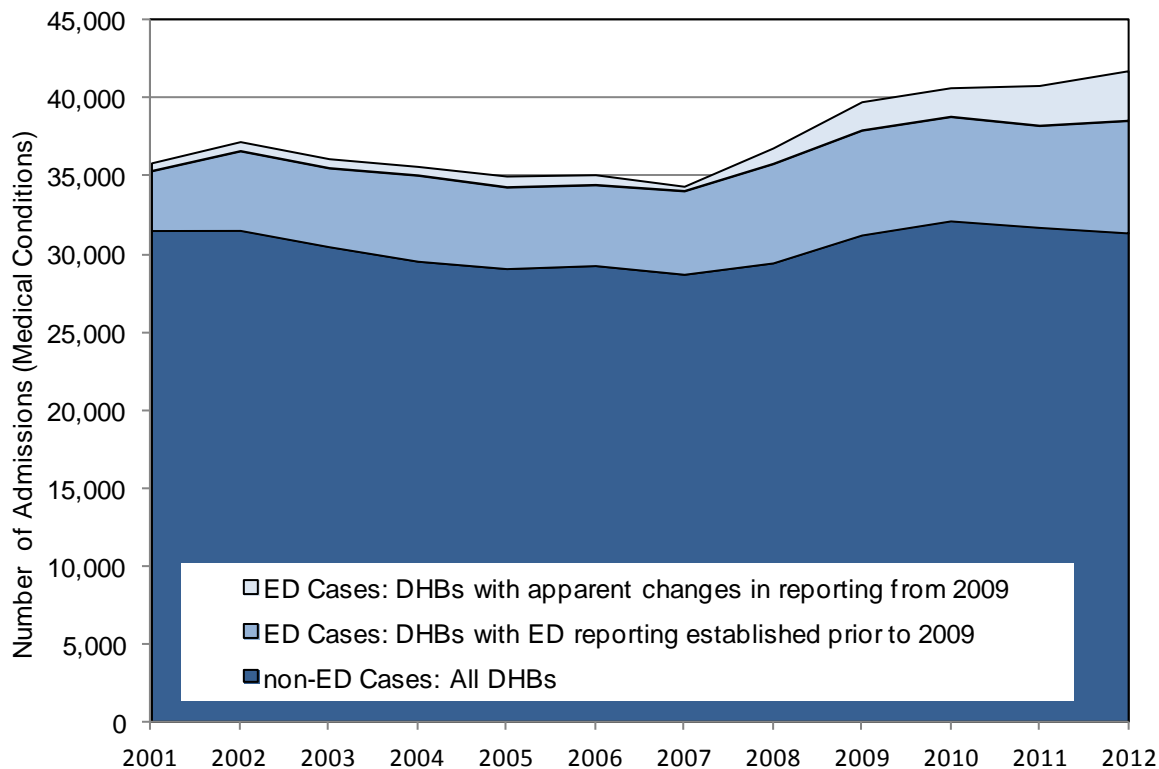
Implications for Interpretation

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 68** 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 68. 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; Acute and Arranged Admissions only; ED cases are those with a health speciality code on discharge of M05–M08. Note: The graph above uses the 2013 coding algorithms for medical admissions with a social gradient, whereas the rest of this report uses the 2012 codes.

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 specialty code on discharge (as there is no specific code for PAU), making them indistinguishable from other paediatric ward admissions.
2. Conversely, the filtering out of 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 is 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 is 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 [7].

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 [156]. 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 [157]. 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 5** 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 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 3: 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 it 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 [158].

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 5** 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, BMI 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 4: 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 [159].

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 Organisation's rules and guidelines for mortality coding [159].

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, LTSA, Police, Water Safety NZ and ESR [156]. 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 5** of this report.

APPENDIX 5: 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 [160]. 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 [161].

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 [160]. 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 [161].

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 [161].

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 [160].



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 [161]. 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 [161].

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 [160]. 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* [162] 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 [163]. 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/combination, total response, or prioritised ethnicity needed to be reported, with the methods used being clearly described in any report [162].

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* [164], 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 [165]. In 2009 Statistics NZ amended the Standard to reflect these issues [166] 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 [165]).

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 [7]. In this Classification System increasing detail is provided at each level. For example [162]:

- 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 [162]. This ensures that each individual is counted only once and that the sum of the ethnic group sub-populations equals the total NZ population [161]. 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 [162]. 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 [162].

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 [8] 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 [167].
2. Research also suggests that ethnic misclassification may vary significantly by DHB [167], 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 analysis 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 6: 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 [168]. 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 59**). 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 approx 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 NZDep decile 1 reflecting the least deprived 10% of small areas and NZDep decile 10 reflecting the most deprived 10% of small areas [169].

Table 59. Variables used in the NZDep2006 Index of Deprivation [170]

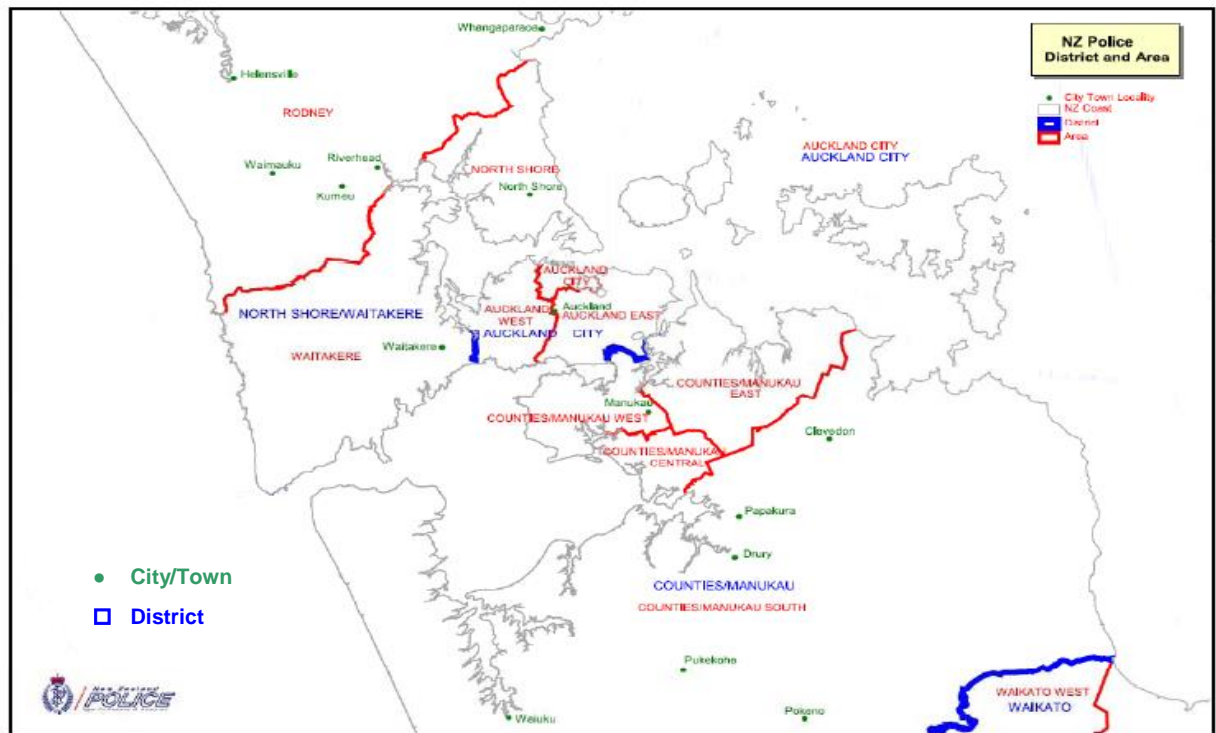
No	Factor	Variable in Order of Decreasing Weight in the Index
1	Income	People aged 18–64 receiving means tested benefit
2	Employment	People aged 18–64 unemployed
3	Income	People living in households with income below an income threshold
4	Communication	People with no access to a telephone
5	Transport	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 (where 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 [168]. Despite these limitations, the NZDep has been shown to be predictive of mortality and morbidity from a number of diseases in New Zealand.



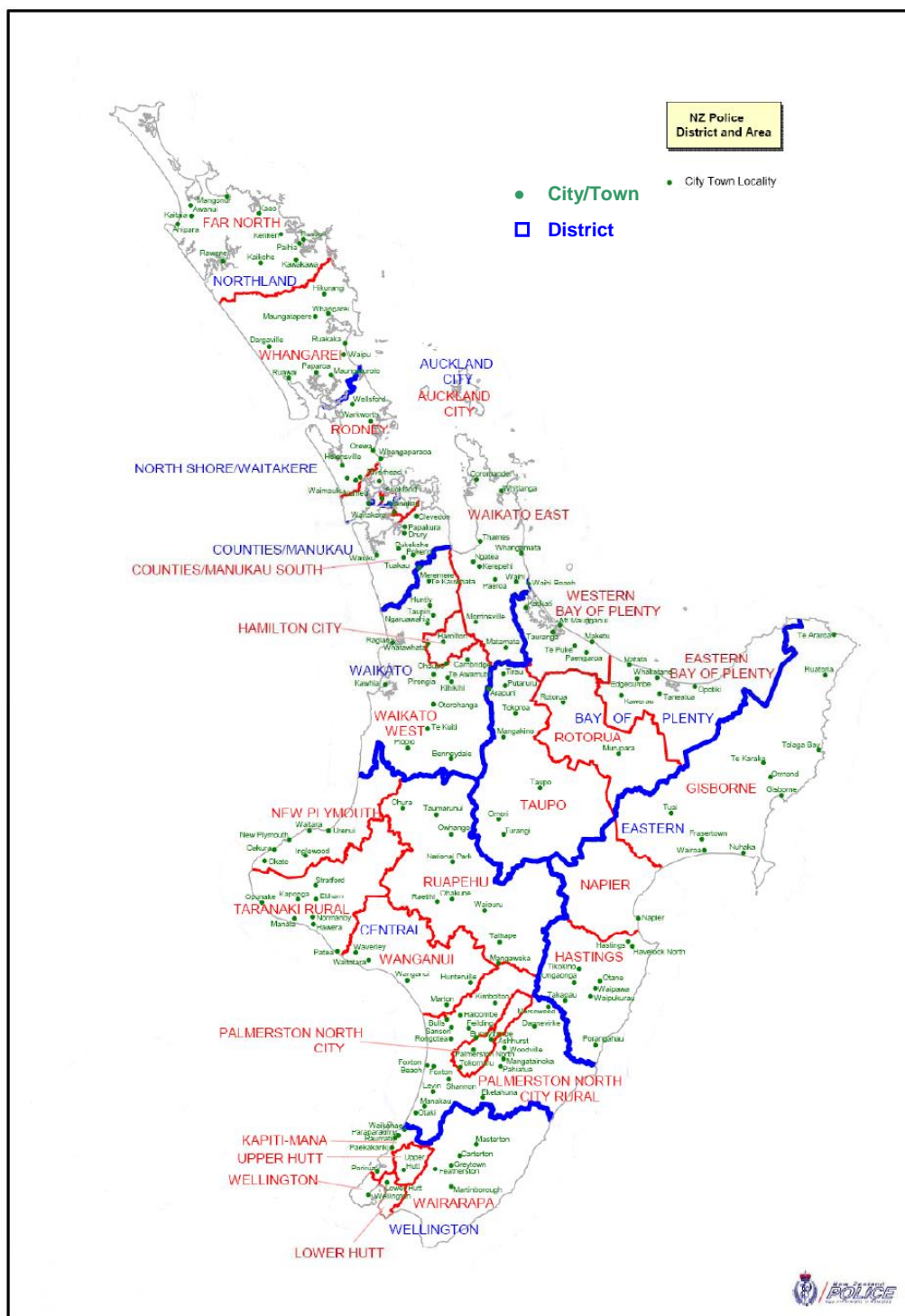
APPENDIX 7: POLICE AREA BOUNDARIES

Figure 69. New Zealand Police Area Boundaries in the Auckland Region



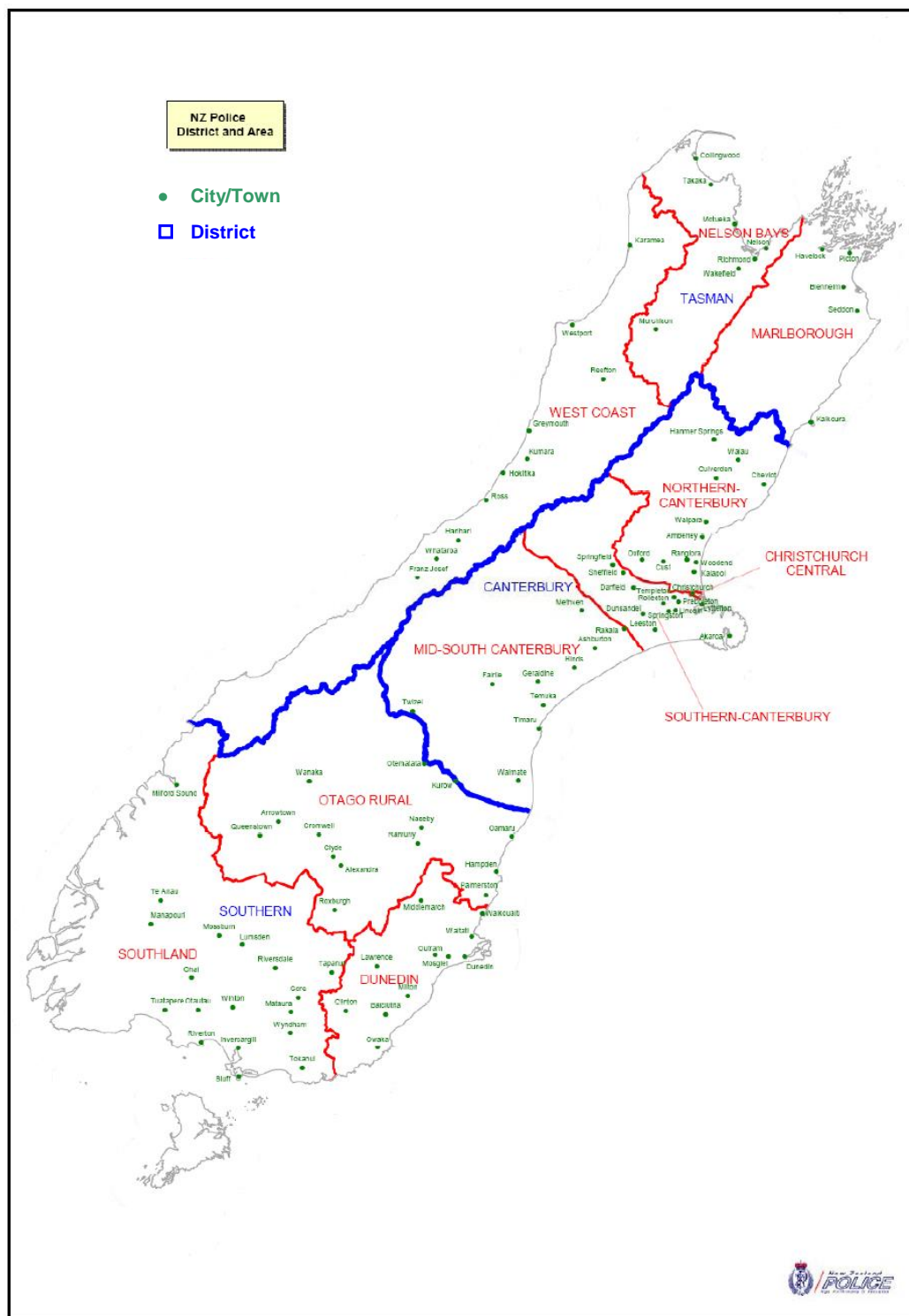
Source: <http://www.stats.govt.nz/products-and-services/table-builder/crime-tables/maps.htm>

Figure 70. Police Area Boundaries in the North Island



Source: <http://www.stats.govt.nz/products-and-services/table-builder/crime-tables/maps.htm>

Figure 71. Police Area Boundaries in the South Island



For further information see <http://koordinates.com/layer/3825-nz-police-area-boundaries/>

APPENDIX 8: HOSPITAL ADMISSIONS AND MORTALITY WITH A SOCIAL GRADIENT METHODS

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 decile) and the association was biologically plausible.

Inclusion and Exclusion Criteria

Neonatal hospital admissions (<29 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. As with other NZCYES reports, 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 2** 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.



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