TE OHONGA AKE

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

SERIES TWO

Te Ohonga Ake
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Series Two

This Report was prepared for the Ministry of Health by Jean Simpson, Judith Adams, Glenda Oben, Andrew Wicken and Mavis Duncanson of the NZ Child and Youth Epidemiology Service

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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

INTRODUCTION AND OVERVIEW

Introduction

In 2012 the Māori Affairs Committee commissioned an inquiry into the determinants of wellbeing for Māori children, the findings of which were underpinned by key principles including that the wellbeing of tamariki Māori is inextricable from the wellbeing of their whānau and that the intergenerational nature of many of the problems facing tamariki Māori must be acknowledged and addressed [1]. The World Health Organisation recognises that inequitable outcomes in health status are mostly the result of the conditions in which children are born and grow; conditions shaped largely by the distribution of power, money and resources and collectively known as the social determinants of health [2]. It is therefore not surprising that many of the submissions received by the Select Committee described how important the socioeconomic determinants of health are to the wellbeing of Māori children and their whānau. Such determinants included family income, education, housing, primary and preventative health services, and nutrition [3]. In a response to this inquiry in April 2014 the Government expressed the view that responsibility for tamariki Māori and their whānau lies with government agencies and their sectors as part of their responsibilities for ensuring the wellbeing of the whole population and acknowledged the need for reporting of outcome information for Māori alongside other groups [4].

Report Aims

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

1. Provide a snapshot of progress in addressing many of the determinants of health including child poverty and living standards, housing, early childhood education, oral health, tobacco use, alcohol related harm, and children's exposure to family violence.
2. Assist those working in the health sector to consider the roles other agencies play in influencing child and youth health outcomes related to these determinants.

Report Structure and Indicators

The report, which is one of a three part series on the health of Māori children and young people, fits into the reporting cycle as follows:

Year 1 (2011) The Health Status of Māori Children and Young People

Year 2 (2012) The Determinants of Health for Māori Children and Young People

Year 3 (2013) Māori Children and Young People with Chronic Conditions and Disabilities

Continuing the cycle would have made this year's report a health status report, but due to the delay in the release of the 2013 census data (necessary for denominators to calculate disease rates) it was decided to make this year's report deal with the determinants of health instead as fewer of the indicators relating to the determinants of health were census dependant. (The 2015 report will be a health status report.)

In exploring the underlying determinants 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 as follows:

1. **The Wider Macroeconomic and Policy Context**: Indicators in this section consider the wider economic and policy environment and include gross domestic product (GDP), income inequality, child poverty and living standards, unemployment, 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, and 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 considers issues relevant to the Well Child/Tamariki Ora Schedule, including immunisation coverage and the uptake of Well Child/Tamariki Ora contacts (via Plunket and B4 School Checks). The second part considers a range of issues associated with substance use, including smoking in pregnancy, exposure to second-hand cigarette smoke, smoking in young people, and alcohol-related harm.
4. **Health Outcomes as Determinants**: This section is divided into two parts, with the first considering hospital admissions and mortality from a range of socioeconomically sensitive conditions and the second considering children and young people's exposure to family violence and assault, including indicators of 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.

Viewpoint

A viewpoint by Dr Bridget Robson, independent Māori commentator from the University of Otago, begins on page 32 and reflects on the findings of the report in the context of Māori economic values. The viewpoint highlights the benefits to our whole society when all children have equitable access to excellent education, healthy secure housing, safe environments to live, learn and play, and opportunities to fully participate in the economic, social and cultural life of the nation. Previous commentators in the Te Ohonga Ake series have included Dr Joanne Baxter, Dr Emma Wyeth and David Tipene-Leach.

Data Quality Issues and the Signalling of Statistical Significance

In the preparation of this report, high quality data were not always available in areas of public health importance. In a number of areas, the authors have opted to utilise data of lesser quality, in order to ensure that important issues do not fall below the public health radar. As a consequence, the reader is strongly urged to read the cautions on interpretation that accompany each indicator in order to gain a better understanding of the strengths and weaknesses of the data used. A number of more specific data quality issues are outlined below.

Ethnicity Coding and the Ethnicity Classifications Used in this Report

In New Zealand's national health collections up to three ethnic groups are stored electronically for each event [5]. Because of inconsistencies in the way ethnicity information was collected in national data collections prior to 1996, all of the ethnic specific analyses presented in this report are from 1996 onwards, and therefore reflect self-identified concepts of ethnicity (see **Appendix 5** for a more detailed review). Unless otherwise specified, total response ethnicity has been used to identify Māori children and young people (i.e. those identifying as Māori in any of their first three ethnic groups). In contrast, 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: While in the Health Sector, the non-Māori reference group is often used for rate ratio comparisons, the non-Māori non-Pacific reference group was selected by the Te Ohonga Ake Advisory 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

Despite significant improvements in the quality of ethnicity data since 1996, care must still be taken when interpreting the ethnic specific rates presented in this report, as there is still the potential for Māori children and young people to be undercounted in our national data collections. In a review linking hospital admission and cancer registry data to other more reliable data sources, the authors of *Hauora Māori Standards of Health IV* [6] 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**). Therefore, when reviewing the hospital admission data in sections which follow, the reader must bear in mind that none of the rates have been adjusted for undercounting, and so the rate ratios presented may underestimate, to a variable extent, the magnitude of any ethnic inequalities present.

Denominators

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

Statistical Significance Testing

Appendix 1 outlines the rationale for the use of statistical significance testing in this report. **Appendix 2** to **Appendix 4** contain information on the data sources used to develop each indicator. **Appendix 5** covers issues regarding measuring ethnicity. Readers are urged to be aware of the contents of these appendices when interpreting the information in this report. **Appendix 6** provides an overview of the NZ Deprivation Index. There are two deprivation indices used: NZDep 2013 is used where data relate to the 2013 Census and NZDep 2006 is used for the remaining data sources.

If tests of statistical significance have been used in a particular section, the text will have the words *significant*, or *not significant* in italics. Where the words *significant* or *not significant* do not appear in the text, the associations described do not imply statistical significance or non-significance. This is explained further in **Appendix 1**.

Concluding Comments

This report provides an overview of the underlying determinants of health for Māori children and young people in New Zealand. It documents some areas where there has been progress, for example the increasing proportion of Māori new entrants who have participated in early childhood education prior to school entry, falling rates of school stand downs, suspensions, exclusions and expulsions for Māori students, increased immunisation rates, and falling tobacco use in young people, but it also documents continuing inequality between Māori and non-Māori non-Pacific children. Māori children are disproportionately likely to live in areas of high socioeconomic deprivation, to have mothers who smoked during pregnancy, and to live in sole parent households.

This report also aims to assist those working in the health sector to consider some of the other agencies which have an influence on child and youth health. An inter-agency approach is necessary since addressing the disproportionate burden of avoidable morbidity and mortality experienced by Māori children and young people is a formidable task for the health sector alone. Working jointly with Child Youth and Family and the Police to protect vulnerable children from intentional injury, or with Housing New Zealand and other social housing providers to ensure families can access affordable good quality housing, are examples of tangible starting points.

While addressing the underlying drivers of New Zealand's high child poverty rates is beyond of the reach of the health sector, this should not preclude the sector from being involved in ongoing advocacy to help ensure that every child in New Zealand has the opportunity to grow up to reach their full potential.

Overview of the Determinants of Health for Māori Children and Young People

Table 1 provides an overview of the indicators in this year's report, their distribution by various demographic factors, and where data permit, how they have tracked over time. Table 1. Overview of the Determinants of Health for Māori Children and Young People

Indicator	Distribution and trends for Māori children and young people
Regional demographic profile	
Distribution of Māori child and youth population	
2013 census population profiles	• At the 2013 census, children and young people comprised 52.1% of the Māori population. The age group that constituted the highest proportion of the Māori population was the 0–4 year old age group, followed by the 5–9 year olds. • The proportion of Māori children and young people living in each NZDep decile increased with increasing deprivation from 3.8% in the least deprived areas (NZDep decile 1) to 21.9% in the most deprived areas (decile 10). • At the 2013 census, there were 233,000 Māori children, making up 25.6% of the total New Zealand child population, and 127,750 Māori young people, making up 20.4% of the total New Zealand youth population. • The DHB with the highest number of Māori children was Waikato and the DHB with the lowest was West Coast. The DHB with the highest percentage of children identified as Māori was Tairawhiti (65%) and the DHB with the lowest was Auckland (12.8%). • The DHB with the highest number of Māori young people was Waikato and the DHB with the lowest was West Coast. The DHB with the highest percentage of young people identified as Māori was Tairawhiti (60.8%) and the DHB with the lowest was Auckland (10.4%).
Number of Māori births	
Regional births	• During 2000–2013 the number of Māori births followed a similar trend to the total number of births, generally increasing from 2000 to 2008 and then generally falling. The percentage of all New Zealand live births identified as Māori fluctuated between 27% and 30%. • In 2013, Counties Manukau DHB had the highest number of Māori babies registered and the West Coast DHB had the lowest. The DHB with the highest percentage of babies registered as Māori was Tairawhiti (68.3%), and the DHB with the lowest was Auckland (13.8%).
The wider macroeconomic and policy context	
Child poverty indicators	
Income-based measures	• In 2013 in New Zealand, 260,000 (24%) dependent children aged 0–17 years were living in relative poverty using the measure of below 60% of the contemporary median income, after housing costs, a slightly smaller percentage than in 2010–2012. • Child poverty rates were higher for younger children (0–11 vs. 12–17 years), larger households (3 or more children vs. 1 or 2 children), sole parent households and households where the adults were either workless, or where none worked full time. • During 2011–2013, on average, around 34% of Māori children lived in poor households, compared to an average of 16% of European children (using the AHC 60% fixed-line measure).The higher poverty rates seen in Māori children potentially reflect the relatively high proportion of Māori children living in sole parent beneficiary households (during 2007 to 2011 around 43% of domestic purpose benefit (DPB) recipients were Māori).

Material hardship	• In 2012, around 180,000 children (17%) were living in material hardship according to the Economic Living Standards Index (ELSI). The proportion of children aged 0–17 years in material hardship rose from 16% in 2009 to 21% in 2011, before falling to 17% in 2012. • The 2008 Living Standards Survey suggested that 22% of children lived in families experiencing four or more (out of a possible 14) "enforced lacks" (10% had a DEP Score of 4–5 and 12% had a DEP score of 6+). These children were more exposed 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. • In the 2008 Living Standards Survey 39% of Māori children, and 15% of European children aged 0–17 years were in families experiencing material hardship (i.e. had four or more "enforced lacks"). In the same survey, 59% of children whose family's income source was a benefit experienced material hardship.
Poverty severity and persistence	• Statistics New Zealand's Survey of Family, Income and Employment (SoFIE) for 2002−2009, indicated that, of the children who were aged 0–17 years in the first year of SoFIE (2002−03), 24% lived in households experiencing persistent poverty (i.e. an income which, when averaged across all seven years, was below 60% of the gross median) and 29% were deemed to be in current poverty (i.e. with an income below 60% of the gross in the year under review).
Macroeconomic indicators	
Gross Domestic Product	• In New Zealand, GDP has increased over the last 14 consecutive quarters since March 2011. GDP grew by 0.7% in the June quarter of 2014. Economic activity for the year ending June 2014 increased by 3.5%, when compared to the year ending June 2013. • In New Zealand real GDP per capita increased 60% from $31,426 in the March quarter of 1975, to $50,261 in the March quarter of 2014, while real average ordinary time hourly earnings only increased 18%, from $23.81 to $28.18, during the same period.
Income inequality	• During 1982–2013 income inequality, as measured by the P80/P20 ratio and Gini coefficient, was higher after adjusting for housing costs, as housing costs make up a greater proportion of household income for lower income, than for higher income households. • The most rapid rises in income inequality occurred in the late 1980s and early 1990s. During the early-to-mid 2000s income inequality as assessed by the P80/P20 ratio declined as a result of the Working for Families package and improving employment. • During 2009–2013, income inequality fluctuated due 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.
Unemployment rates	• In the quarter ending June 2014, the seasonally adjusted unemployment rate fell to 5.6%, while seasonally adjusted unemployment numbers decreased from 146,000 in the March quarter of 2014, to 137,000 in the June quarter. The number of people employed increased by 10,000 to reach 2,328,000. • In New Zealand during June 1987–2014, unemployment rates were consistently higher for younger people aged 15–19 years than other age groups (15–19 years > 20–24 years > 25–29 years > 35–39 years and 45–49 years). There were no consistent gender differences in unemployment rates for young people aged 15–24 years. • Unemployment rates were highest for those with no qualifications, followed by those with school qualifications only, or post school but no school qualifications, then those with both post school and school qualifications. • During the period March 2008 to June 2014 unemployment rates were consistently higher for Māori than European people. Unemployment rates increased for both ethnic groups during 2008 and 2009, but were more variable between 2010 and 2014. In the quarter ended June 2014, unemployment rates were 11.0% for Māori and 4.1% for European people.

Children reliant on benefit recipients	• The proportion of all children aged 0–17 years in New Zealand who were reliant on a benefit recipient fell from 26.2% in June 2000 to 18.5% in June 2008. The proportion then increased, to reach a peak of 21.4% in June 2010, before falling again to 19.6% in June 2013. • A large part of the initial decline was due to a fall in the proportion of children reliant on unemployment benefit recipients. The rate of decline in the number of children reliant on Domestic Purposes Benefit (DPB) recipients was much less than the rate of decline in the number reliant on unemployment benefit recipients. As a consequence, the proportion of benefit-dependent children who were reliant on DPB recipients actually increased, from 68.4% of benefit-dependent children in June 2000, to 76.9% in June 2013. • In June 2014, after the welfare reform was introduced, the proportion of all children aged 0–17 years in New Zealand who were reliant on a benefit recipient was 17.9%. The proportion of all children who were reliant on recipients of the various benefits types was: Sole Parent Support 12.9%, Jobseeker Support 3.0%, and Supported Living Payment 1.7%. • At the end of June 2014, the proportion of children reliant on a benefit recipient was highest among those aged 1–4 years. The proportion reduced gradually with increasing age through middle to late childhood, and then more steeply as children reached 13 years of age.
Young people reliant on benefits	• In New Zealand during June 2000–2013, there were large fluctuations in the number of young people aged 16–24 years reliant on a benefit, with rates falling from 165.1 per 1,000 in June 2000, to 75.5 per 1,000 in June 2007, before increasing again to 117.5 per 1,000 in June 2010. By June 2013, the rate was 97.6 per 1,000. • When broken down by benefit type, the largest initial declines were seen for those reliant on an unemployment benefit. The proportion reliant on a domestic purposes benefit declined much more slowly, before increasing again in 2011. The proportion reliant on invalid's and sickness benefits, however, increased through most of 2000–2013. • In June 2014, following the welfare reform in July 2013, the number of young people reliant on a benefit was 52,663. The majority were reliant on the Jobseeker support, followed by Sole Parent Support. • In New Zealand as at June 2014, Māori young people had much higher rates of reliance on Jobseeker Support and Sole Parent Support than non-Māori non-Pacific young people. Ethnic differences in rates of Supported Living Payment were relatively small. • In New Zealand during June 2014, 36.1% of young people receiving a Supported Living Payment benefit required financial support for psychological or psychiatric reasons, while 14.8% required support for intellectual disabilities. An additional 18.9% required support as the result of congenital conditions, and 7.7% as the result of nervous system problems.
Young people not in employment, education or training (NEET)	• In New Zealand during 2014, the majority of young people were in work, education or training. The largest category for 15–19 year olds was not in the labour force: in education (51% of both males and females). The largest category for 20–24 year olds was employed: not in education (50.5% of males and 41.8% of females). For those in the NEET category, gender differences in the proportions in the unemployed: not in education and not in the labour force: not in education or caregiving categories were not marked. However, a much higher proportion of females than males were in the not in the labour force: not in education-caregiving category especially in the 20–24 year age group. • In New Zealand, seasonally adjusted NEET rates were relatively static during 2004–2008 but began to rise thereafter, reaching their highest point, at 15.2% in the fourth quarter of 2009, and then generally falling to reach 11.1% in the June 2014 quarter. • In New Zealand during 2009–2014, NEET rates were higher for Māori, than non-Māori non-Pacific young people.

Socioeconomic and cultural determinants	
Household composition indicators	
Children in sole parent households	• The proportion of children living in sole parent households declined from 26.4% in 2001 to 24.1% in 2013. • At the 2013 Census, 42.0% of Māori children lived in sole parent households compared to 16.0% of non-Māori non-Pacific children. • The proportion of children who lived in sole parent households increased with increasing NZDep deprivation for both Māori and non-Māori non-Pacific children. • At each level of NZDep deprivation a higher proportion of Māori than non-Māori non-Pacific children lived in sole parent households. • South Canterbury and Canterbury were the DHBs with the lowest proportion of children aged 0–14 years living in sole parent households (19.0%), while Tairawhiti was the highest (36.6%).
Household crowding	• At the 2013 Census, 10.7% of New Zealand children lived in households requiring one additional bedroom, while 5.1% lived in households requiring two or more additional bedrooms. • The proportion of New Zealand children living in crowded households (i.e. households requiring one or more additional bedrooms) did not change markedly between Censuses. It was 16.2% in 2001, 16.4% in 2006 and 15.8% in 2013. There was, however, a small decline in the proportion of Māori children who lived in crowded households, from 28.6% in 2001, to 24.8% in 2013. • The proportion of Māori children living in crowded households in 2013 was 24.8%, while the proportion of non-Māori non-Pacific children was 8.4%. • The proportion of children living in crowded households in 2013 increased with increasing NZDep13 deprivation for both the Māori and non-Māori non-Pacific ethnic groups. 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 children and young people living in crowded households in 2013 varied by DHB, from 6.2% in South Canterbury to 30.4% in Counties Manukau.
Education indicators	
Early childhood education	• In New Zealand from 2000 to 2013, the number of enrolments in early childhood education increased by 30.5%. Changes varied markedly by service type, however, with enrolments in Education and Care increasing by 73.8% and enrolments in Home Based Networks increasing by 110.6%. In contrast, enrolments in Te Kōhanga Reo decreased by 17.6%, enrolments in Kindergarten decreased by 23.7%, and enrolments in Playcentre decreased by 14.2% • The average number of hours spent in ECE increased for all service types during 2000–2013, with the exception of Playcentres. • The proportion of Māori new entrants reporting participation in ECE prior to school entry increased, from 83.6% in 2001 to 96.3% in 2013. During this period the participation gap between Māori and European children decreased. • In 2013, 12.5% of Māori children attending schools in the most deprived areas (decile 1) had not attended ECE prior to school entry, as compared to only 1.2% of Māori children attending schools in the least deprived areas (decile 10). At all levels of deprivation, the proportion of Māori new entrants who had previously attended early childhood education was lower than the proportion of European children. The difference was greatest in the most deprived areas (87.5% of Māori new entrants vs. 92.7% of European new entrants) and least in the least deprived areas (98.8% of Māori new entrants vs. 99.1% of European new entrants).

Māori medium education	• In New Zealand during 2002–2013, the number of enrolments in licensed Te Kōhanga Reo decreased slightly, from 10,389 in 2002 to 9,179 in 2013. There were also number of children who attended Ngā Puna Kōhungahunga and licence-exempt Te Kōhanga Reo during this period. • There has been a substantial increase in the number of kura kaupapa Māori and kura teina, from 59 in 2000, to 72 in 2013. • In 2013, a total of 67 kura kaupapa Māori schools collectively enrolled a total of 6,352 students. All of the North Island DHBs had kura kaupapa Māori located within their catchments. In the South Island, however, there were no kura kaupapa Māori in Nelson Marlborough, South Canterbury or the West Coast DHBs.
Highest educational attainment at school leaving	• In 2013, 23.8% of Māori students left school with no formal qualifications, while 76.2% left with NCEA Level 1 or above, 60.7% left with NCEA Level 2 or above, and 30.3% attained a University Entrance standard. • While the proportion of students leaving with no formal qualifications declined during 2009−2013, the proportion attaining a University Entrance standard increased. • During 2009–2013, a higher proportion of Māori than European students left school with no formal qualifications, while a higher proportion of European than Māori students attained NCEA Level 1 or more, NCEA Level 2 or more, or a University Entrance standard. For both ethnic groups, the proportion of students with no formal qualifications declined, while the proportion attaining a University Entrance standard increased. • During 2013, the proportion of Māori students achieving a University Entrance standard increased with increasing school socioeconomic decile. At each level of socioeconomic deprivation a higher proportion European than Māori students attained a University Entrance standard.
Senior secondary school retention	• From 2009 to 2013, the proportion of Māori students who stayed on at school until at least 17 years of age increased slightly. In 2013, 67.9% of Māori students stayed on at school until at least 17 years of age, as compared to 85.1% of European, students.
Participation in tertiary education	• During 2006–2013, a large number of students participated in tertiary education. Māori students had the highest age-standardised participation rates overall, and for tertiary education leading to certificate and diploma qualifications, but the lowest rates for tertiary education leading to Bachelor's level qualifications.
School stand-downs, suspensions, exclusions and expulsions	• During 2000–2013, suspension rates gradually declined, while stand-down rates increased, reached a peak in 2006 and then declined. Exclusion and expulsion rates were more static. Throughout 2000–2013, stand-down rates greatly exceeded suspension rates, which exceeded exclusion and expulsion rates. • Stand-down and suspension rates were higher for Māori than European students throughout 2000–2011. Stand-down rates for Māori, and European students declined after 2006, but at a greater rate for Māori. Suspension rates declined for both ethnic groups during 2000–2013, with the rates for Māori students falling from 18.8 per 1,000 in 2000, to 9.1per 1,000 in 2013. • During 2000–2013, exclusion and expulsion rates for Māori students both exhibited a general downward trend, with exclusion rates falling from 6.3 per 1,000 in 2000, to 3.6 per 1,000 in 2013. Similarly, expulsion rates fell from 5.4 per 1,000 in 2000, to 2.4 per 1,000 in 2013. Throughout this period, exclusion and expulsion rates were higher for Māori than for European students • The most common reasons for a suspension were the misuse of drugs or other substances (25.7%), continual disobedience (25.3%), or a physical assault on other students (17.5%), which together accounted for 68.5% of all suspensions.

Truancy and unjustified absences	• In 2013, total unjustified absence rates were relatively low during the primary school years (Years 1–6), but increased progressively through the secondary school (Years 9–13), with the highest rates being seen in those in Year 13+. While rates of frequent truancy also increased through the secondary school years, the rate of increase was less marked than for total unjustified absences. • During 2011–2013 total unjustified absence rates in Māori students were around 6 per 100 students, while frequent truancy rates were in the range 1.8 to 1.9 per 100 students. • In each of the years 2011, 2012, and 2013, total rates of unjustified absences and frequent truancy were higher for Māori than for European students. Total unjustified absences were lower in 2013 than they were in 2011 for both Māori, and European students. Frequent truancy rates were higher in 2013 than in 2011 for Māori students, but similar for European students. • In 2013, total rates of unjustified absences and frequent truancy decreased as the degree of deprivation of school catchment decreased, with the lowest rates for both outcomes being seen in the least deprived areas (deciles 9−10).
Risk and protective factors	
Well Child indicators	
Immunisation coverage	• In New Zealand, for the year ending 30 June 2014, immunisation coverage rates for Māori children varied with age, being lowest at six months (64.8%) and highest at 12 months (92.1%). • Māori rates were lower than non-Māori non-Pacific rates at all ages but the difference was small (around 1 percentage point) at ages 12 and 24 months. • Over the period 2009–2014, immunisation rates increased for Māori children all ages.
Plunket children receiving core well child contacts	• In the year ending June 2013, around 11,000 new Māori babies were enrolled with Plunket. • The number of core contacts received by the Māori new Plunket babies increased slightly from 5.0 core contacts for the year ending June 2006 to 5.8 core contacts for the year ending June 2013. The number of additional contacts also increased, from 4.5 in 2006 to 6.2 in 2013. • Compared to non-Māori non-Pacific babies, Māori Plunket babies received slightly fewer core contacts and slightly more additional contacts.
The B4 School checks	• From 2012 to 2014, the percentage of children who received a B4 School check increased, for all New Zealand children and also for Māori children, non-Māori non-Pacific children and children in high deprivation areas. • In 2014, 82.7% of Māori children received a B4 School check, compared to 96.1% of non-Māori non-Pacific children. • In 2013, the proportion of Māori children receiving a B4 School check varied by DHB, from 64.8 % in Auckland to 114.5% in the Southern DHB. In most, but not all DHBs, a lower proportion of Māori children than non-Māori non-Pacific children received a B4School check. • In the year ending 7th July 2014, 78.0% of Māori children and 84.1% of non-Māori non-Pacific children who received a B4 School Check had started this check prior to 4.5 years of age.

B4 School checks hearing screening	• From 2012 to 2014, the percentage of children undergoing audiometry screening who required rescreening due to failed audiometry declined for Māori children, for non–Māori non-Pacific children and for all New Zealand children. • In 2014, the percentage of Māori children who required rescreening because of failed audiometry was 6.5%. The percentage of Māori children who required referral following failed audiometry increased slightly between 2012 and 2013, but changed little thereafter. In 2014, 8.9% of Māori children undergoing hearing screening required referral due to failed audiometry. • During the years ending 7 July 2012–2014, significantly higher proportions of Māori than non-Māori non-Pacific children required rescreening or referral following failed audiometry. • During 7 July 2012–2014, a *significantly higher* proportion of children from the most deprived areas (NZDep deciles 9–10 vs deciles 1–8) required rescreening or referral following failed audiometry. Rescreening rates declined for both socioeconomic groups during this period, while referral rates were more variable.
B4 School check vision screening	• During 7 July 2012–2014, the proportion of Māori children not already under care with a visual acuity of 6/12 or worse in one or both eyes changed very little. In 2014 it was 5.8% (compared to 4.9% for non-Māori non-Pacific children, a statistically significant difference). • During 7th July 2012–2014, a *significantly higher* proportion of children from the most deprived areas (NZDep deciles 9–10 vs deciles 1–8) had an untreated visual acuity of 6/12 or worse in one or both eyes. Rates for children from the most deprived areas declined during this period, while rates for children from less deprived areas changed little.
Oral health indicators	
The proportion of children who were caries-free at 5 years	• From 2000 to 2012, the percentage of children who were caries-free at age 5 years was consistently higher in areas with fluoridated water supplies. • A higher proportion of non-Māori non-Pacific children than Māori children were caries-free at age 5 years. For both Māori children and non-Māori non-Pacific children, the proportion that were caries-free was higher in areas with fluoridated water supplies from 2003 to 2012.
Mean number of decayed, missing or filled permanent teeth at 12 years	• Children aged 12 years in areas with non-fluoridated water supplies had higher mean scores for the number of decayed, missing or filled teeth (DMFT) than the mean DMFT scores for children in areas with fluoridated water supplies. • Mean DMFT scores at age 12 years were higher for Māori children than non-Māori non-Pacific children. For both ethnic groups, mean DMFT scores were higher for children in areas with non-fluoridated water supplies.

Hospital admissions for dental caries and other dental conditions	• During 2000–2013, hospital admission rates for dental caries were highest for children aged 0–4 years, followed by children aged 5–14 years, and then young people aged 15–24 years. While admissions increased for all three age groups during 2000–2013, in absolute terms, increases were greater for those aged 5–14 and 0–4 years. • During 2009–2013, hospital admission rates for dental caries were low in infants <1 year, but rose rapidly with increasing age thereafter, to reach a peak at 4 years of age. Rates then decreased, with admissions being relatively infrequent after 14 years of age. • During 2009–2013, dental caries, followed by diseases of the pulp and periapical tissue, were the leading reasons for a dental admission in Māori children aged 0–4 and 5–14 years. Embedded/impacted teeth, followed by dental caries were the leading reasons for an admission in Māori young people aged 15–24 years. • Over the period 2000 to 2013, hospital admissions for dental caries increased for Māori children, in the 0–4 years age group (up 40%), in the 5–14 years age group (up 112%) and in the 15–24 years age group (up 49%). Over the same period, there was little change in non-Māori non-Pacific children's admission rates in the 0–4 years age group, but there were increases in the 5−14 years age group (up 80%) and in the 15–24 years age group (up 39%). During 2000–2013, hospital admissions for dental caries were significantly higher for Māori than non-Māori non-Pacific children and young people in all age groups. The difference between the ethnic groups was greatest for 0–4 year olds, where the Māori rate was double the non-Māori non-Pacific rate, but it was small in the 15–24 years age group.
Substance use	
Smoking in pregnancy	• During 2008–2012, 56.9% of Māori babies were born to mothers who were non-smokers both at first registration with a Lead Maternity Carer (LMC) and two weeks after their babies were born, while 30.3% of Māori babies were born to mothers who were smokers both at first registration with a LMC and two weeks after their babies were born. These figures apply only to babies whose mother was registered with a LMC. During 2008–2010, 14.7% of Māori babies and 11.2% of non-Māori non-Pacific babies were born to mothers who were not registered with a LMC at the time of delivery. However, many of these babies' mothers may have accessed hospital-based maternity services, so it is difficult to estimate the proportion of babies who were born to mothers who received no antenatal care at all during pregnancy. • In contrast, 87.7% of non-Māori non-Pacific babies were born to mothers who were non-smokers both at first registration with a LMC and two weeks after their babies were born, and 6.1% of non-Māori non-Pacific babies were born to mothers who were smokers both at first registration with a LMC and two weeks after their babies were born. • During 2008–2012, the proportion of Māori babies who had smoking mothers was highest for babies born to mothers aged in their late teens and early 20s and lowest for babies born to mothers aged in their mid-30s.The proportion of Māori babies with smoking mothers was higher than the proportion of Non-Māori non-Pacific babies with smoking mothers for all maternal ages.
The proportion of children who live in a household with a smoker	• The proportion of all New Zealand children living in a household with a smoker declined from 40.2% in 1996 to 26.7% in 2013. • At the 2013 Census, 48.0% of Māori children lived in a house with a smoker compared to 19.1% of European children. The proportion of children living in a household with a smoker declined for both ethnic groups between 1996 and 2013. • At the 2013 Census, the proportion of children living in a household with a smoker increased from 9.9% for those in the least deprived areas (NZDep decile 1) to 47.7% for those in the most deprived areas (NZDep decile 10). • At the 2013 Census, the proportion of Māori children living in a household with a smoker increased from 17.3% for those in the least deprived areas (NZDep decile 1) to 62.6% for those in the most deprived areas (NZDep decile 10). In the same period, the proportion of European children living in a household with a smoker increased from 8.9% for those in the least deprived areas to 41.0% for those in the most deprived areas. At all levels of deprivation, the proportion of Māori children living in households with a smoker was higher than the proportion of non-Māori non-Pacific children.

The proportion of young people who are regular smokers (census data)	• The proportion of young people who were regular smokers declined from 24.5% in 1996 to 14.1% in 2013. • At the 2013 Census, 28.2% of Māori were regular smokers compared to 12.8% of European young people. The proportion of Māori young people who were regular smokers was significantly higher than the proportion of European young people. The proportion of young people who were regular smokers declined for both ethnic groups between 1996 and 2013. • At the 2013 Census, the proportion of young people who were regular smokers increased from 6.5% for those in the least deprived areas (NZDep decile 1) to 23.1% for those in the most deprived areas (NZDep decile 10). • At the 2013 Census, the proportion of Māori young people who were regular smokers increased from 12.4% for those in the least deprived areas (NZDep decile 1) to 37.7% for those in the most deprived areas (NZDep decile 10). The proportion of European young people who were regular smokers increased from 6.5% for those in the least deprived areas to 23.6% for those in the most deprived areas. At each level of deprivation, a higher proportion of Māori young people than European young people were regular smokers.
The proportion of Year 10 students who are daily smokers (ASH surveys)	• From 1999 to 2013 the proportion of Year 10 students who were daily smokers declined, from 15.6% in 1999 to 3.2% in 2013 while the proportion who had never smoked increased, from 31.6% in 1999 to 75.1% in 2013. • During 1999–2013, daily smoking rates for Māori students were higher for females than for males. There were marked ethnic differences in daily smoking during this period. The proportions of Māori students who smoked daily were consistently higher than the proportions of NZ European students. • Daily smoking rates declined for both Māori and European students (for both males and females) during 1999–2013.
Alcohol-related hospital admissions	• During 2000–2013, rates of alcohol-related hospital admissions in Māori young people were relatively static. • On average, during 2000–2013, the Māori alcohol-related admission rate was *significantly higher* than (approximately double) the non-Māori non-Pacific rate. • During 2009–2013, there were very few alcohol-related hospital admissions in Māori children aged less than 13 years. The alcohol-related admissions rate for Māori young people increased with increasing age from the age of 13 years. • During 2009–2013, alcohol was listed as a contributory cause in a considerable number of hospital admissions in Māori young people. However, only 10.2% of these admissions had acute intoxication or the toxic effects of alcohol listed as the primary diagnosis. In 43.8% of cases an injury was the primary diagnosis, with head and upper limb injuries being particularly common. • In addition, 34.7% of admissions had a mental health condition (including alcohol dependence) listed as the primary diagnosis. Schizophrenia and other schizotypal and delusional disorders were the most frequent mental health diagnoses recorded. Poisoning by drugs, medicines, or substances was listed as the primary reason in 8.1% of admissions.

Health outcomes as determinants	
Hospital admissions and mortality with a social gradient	
Hospital admissions	• During 2009–2013, for Māori children, bronchiolitis, asthma and wheeze, and acute respiratory infections made the largest individual contributions to hospitalisations for medical conditions with a social gradient, and infectious and respiratory diseases collectively were responsible for the majority of admissions. Falls, followed by inanimate mechanical forces were the leading causes of injury admissions with a social gradient. • Medical admissions with a social gradient in Māori children increased from 2000 to 2001, remained steady through to 2007, increased from 2007 to 2009, remained steady until 2012, and fell from 2012 to 2013 to reach a level similar to that seen in 2001–2007. In contrast, injury admissions with a social gradient fluctuated from year to year in the early 2000s and followed a downward trend from 2006 to 2013. Throughout the period Māori children's medical admissions for conditions with a social gradient were considerably higher than those for non-Māori non-Pacific children. Their admissions for injuries with a social gradient were also higher than those for non-Māori non-Pacific children but the difference between the two groups was much less marked.
Mortality	• During 2007–2011, post-neonatal 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 deaths made the largest contribution to injury-related deaths, followed by drowning/submersion and pedestrian injuries, while bacterial/non-viral/unspecified pneumonia was the leading cause of mortality from medical conditions. • During 2000 to 2011, in Māori children, mortality from injuries with a social gradient has generally decreased over time, except for an increase from 2004–05 to 2006–07. Māori children's mortality rates for post-neonatal SUDI have shown year to year fluctuations, but, overall, have decreased since 2000–01. No clear pattern is apparent in mortality due to medical conditions. For non-Māori non-Pacific children mortality from injuries has declined, while mortality from medical conditions and post-neonatal SUDI has remained steady.
Infant mortality and sudden unexpected death in infancy	• During 2007–2011, extreme prematurity and congenital anomalies were the leading causes of Māori neonatal mortality, although intrauterine/birth asphyxia and other perinatal conditions also made a significant contribution. In contrast, SUDI was the leading cause of post neonatal mortality, followed by congenital anomalies. • During the late 1990s Māori neonatal and post neonatal mortality both declined. While there was some year to year variation during the 2000s, Māori neonatal and mortality rates in 2010–11 were very similar to what they were in the early 2000s. Māori post-neonatal mortality decreased considerably from 1996–07 to 2002–03, but since then has declined only slightly. Non-Māori neonatal mortality has fluctuated from year to year but overall there has been no clear trend, while non-Māori post-natal mortality has decreased slightly over the period 1996–2011. Throughout the period, neonatal and post-neonatal mortality was consistently higher for Māori than non-Māori non-Pacific infants and, on average, for 2007–2011, *significantly* higher. • During 1996–2011, SUDI mortality was consistently higher for Māori than for non-Māori non-Pacific infants. Rates for both ethnic groups exhibited a general downward trend, but Māori rates declined more steeply so that the absolute difference between the two ethnic groups decreased over the period. • During 2007–2011, mortality from SUDI was significantly higher for Māori infants than for non-Māori non-Pacific infants. On average during this period, 40 Māori infants each year died as the result of SUDI.

Safety and Family Violence	
Injuries arising from the assault, neglect, or maltreatment of children	• During 2000–2013, hospital admissions for injuries arising from the assault, neglect, or maltreatment of children declined gradually, while mortality during 2000–2011 remained relatively static. On average during 2000–2011, approximately eight children per year died as a result of injuries arising from assault, neglect, or maltreatment. • During 2000–2013, Māori children's admission rates for injuries due to assault, neglect of maltreatment increased from 2002–2003 to 2008–09, and then declined rates for non-Māori non-Pacific children declined slightly from 2000–2001 to 2008–09 and from then on changed little. Māori children's rates were higher than rates for non-Māori non-Pacific children throughout the period 2000–2013. They were significantly higher for the period 2009–2013. The number of deaths was too small for it to be possible to undertake any meaningful analysis by ethnicity. • During 2009–2013, hospital admissions for injuries arising from the assault, neglect or maltreatment of Māori children exhibited a U-shaped distribution with age. Infants aged less than one year had the highest rates. Admissions rates were lowest during mid-childhood, but increased with age after eleven years of age. • Amongst Māori children aged 0–4 years who were hospitalised with injuries sustained as the result of assault, neglect or maltreatment during 2009–2013, traumatic subdural haemorrhage were the most frequently assigned primary diagnosis, followed by superficial head injuries. Head injuries as a group accounted for 66.0% of such admissions in these children. In Māori children aged 5–9 years, head injuries accounted for 50% of such admissions (superficial head injuries 22.2.% and other head injuries 27.8%), while in Māori children aged 10–14 years, concussion was the most common primary diagnosis (17.9% of the total), followed by fracture of the skull or facial bones and injuries to the upper limb (both 17.1%).
Injuries arising from the assault in young people	• During 2000–2013, hospital admissions for injuries arising from assault in young people remained relatively static, while mortality during 2000–2013 fluctuated from year to year. On average during 2000–2011, around 12 young people per year died from injuries arising from an assault. • During 2000–2013, Māori young people's admission rates for injuries due to assault were variable. The rate for 2013 was the lowest in the whole period. Rates for non-Māori non-Pacific young people were steady from 2000–01 to 2006–07 and since then have been declining slightly. • Rates for Māori young people were higher than rates for non-Māori non-Pacific young people throughout the period 2000–2013. They were significantly higher for the period 2009–2013. The number of deaths was too small for it to be possible to undertake any meaningful analysis by ethnicity. • Amongst Māori young people during 2009–2013, hospital admission rates for injuries arising from assault increased with increasing age from ages 15 to 18 years but changed very little with increasing age from ages 18 to 23 years. The rates in 24 year olds was lower than in any of the 18–23 years age groups. • Of the 1,840 Māori young people hospitalised as the result of an assault during 2009−2013, 1,115 (60.6%) had a primary diagnosis of a head injury and 725 (39.4%) had a primary diagnosis of a non-head injury. Fractures of the lower jaw were the most frequent primary diagnosis assigned (24.2% of all admissions), followed by injuries of the wrist and hand (13.5% of all admissions). Head and upper limb injuries collectively accounted for 81.7% of admissions.

Child Youth and Family notifications	• During 2013, a total of 148,659 care and protection notifications were received by CYF offices, with 41.6% being thought to require further assessment. The total number of notifications was a little lower than in 2011 and 2012, but the number and the proportion of notifications deemed to require further assessment were a little higher. The number of notifications requiring further assessment has increased steadily since 2004, from 35,350 to 61,877. • During 2004–2013, the number of care and protection notifications received by CYF that required further assessment increased for Māori and children and young people. For non-Māori non-Pacific children over the same period it followed the same general pattern, but there was a small decrease from 2012 to 2013. During the 2013 financial year, 46.3% of notifications requiring further assessment were for Māori children and young people, while 42.4% were for non-Māori non-Pacific children and young people. • 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 almost all referral sources generally rose during 2004–2013, much the largest increases were seen for Police family violence referrals, which increased from 3,389 in 2004 to 82,408 in 2011 before falling to 70,542 in 2013. In 2013, Police family violence referrals were the most frequent source of CYF notifications, followed by the Police (other referral types) and the health sector. The proportion of Police family violence referrals which required further assessment declined, from 70.5% in 2004 to 11.1% in 2013. While similar trends were seen for other referral sources, the magnitude of these declines was much less marked. • Of those notifications which were assessed further during 2004–2013, a large proportion (over 50% in all years except 2008, where the proportion was 49%) resulted in no abuse being found. Where abuse was found, it was most commonly emotional abuse and least commonly sexual abuse Behavioural and relationship difficulties were the most frequent non-abuse findings. Because of the nature of the reporting system, and the fact that a single child may appear in a number of abuse categories, it is difficult to determine what proportion of cases related predominantly to a particular type of abuse.
Family violence	• Of the 95,082 Police family violence investigations which occurred in New Zealand during 2013, children were reported as being present or usually residing with the victim in 62.2%. • Of the 95,082 Police family violence investigations during 2013, 37,886 (39.8%) resulted in at least one offence being recorded.

VIEWPOINT: TE TOTO O TE TANGATA, TE ORANGA O TE IWI. DIFFERENTIAL IMPACT OF INCOME AND WEALTH INEQUITIES ON MĀORI CHILDREN AND YOUNG PEOPLE

Dr Bridget Robson

This edition of Te Ohonga Ake highlights the unequal distribution of the determinants of health between Māori and non-Māori families, and the consequences of socioeconomic gradients for the health and wellbeing of Māori children and young people. Inequalities in income and living standards put Māori children and youth at increased risk of problems with ears, eyes, and teeth; higher likelihood of living with a smoker and becoming a smoker as a young adult; higher risk of alcohol related hospitalisations and admissions for socioeconomically sensitive medical conditions. Housing, education, and employment options are also constrained.

Māori (and Pacific) children are more than twice as likely as Pākehā children to grow up in households experiencing significant hardships – evidence of structural discrimination that differentially streams a child's health and life chances by ethnicity. Yet it doesn't have to be this way. As the introduction to this report states, 'inequitable outcomes in health status are mostly the result of conditions in which children are born and grow; conditions shaped largely by the distribution of power, money and resources' (p.17). Redistribution of power, money and resources is essential to achieve an inclusive society, and a central responsibility of governments.

Te Ohonga Ake heralds a growing awareness, an awakening to the realisation that inequality is a whole of society issue, that the forces driving concentrations of poverty are the same as those impelling concentrations of affluence [7]. While much attention has rightly been paid to those without sufficient resources, those with more than enough have remained unexamined and under-researched. However, there is a reinvigorated focus on those who benefit most from the nation's economic resources as concerns that the power associated with wealth, and increasing segregation of 'the rich and the rest' [8], undermines the goals of a sustainable and inclusive economy [9,10]. Income and wealth both matter, and inequalities in each are inextricably linked.

"Te toto o te tangata he kai; te oranga o te tangata he whenua" (the lifeblood of a person is derived from food; the livelihood of a people depends on land) illustrates the importance of wealth as well as income. Income provides the kai – what we need to survive every day. Wealth is with the whenua. With whenua we can feed the people of today and the generations of tomorrow. We can store kai for lean times, grow our pa harakeke, and build our whare to house the people. It was this imperative that drove the Māori Land marchers of 1975 who called for "not one more acre of Māori land" to be taken, [11] and again at the Hikoi of 2004.

Other concepts of wealth reveal the values motivating the strategic focus of many Māori - "our people are our wealth", "the marae is our principal home", "the Māori language is a taonga" [12]. Our people, our marae, our language, (our cultural capital) support our capacity to understand our environment, to nurture relationships with ancestors and with future generations. They nourish and sustain our cultural, spiritual, and social wellbeing.

Joe Williams [13] argues that according to the first law of Aotearoa land transfers based on tuku depended on the maintenance of healthy relationships between those who transferred the land and the transferee. Thus the transfer was reversible. The second law brought by the settlers brought viewed land transfers or 'contracts' as one-off, autonomous, and final. The clash of values between the two laws was that "one was predicated on personal connectedness (and through that group autonomy) and the other was predicated on personal

autonomy (and through that group welfare)" [13]. The dominance of the second law facilitated massive Māori land alienations through Crown purchases, war and confiscations, the Native Land Court, and the Public Works Acts.

This erosion of the Māori economic base, alongside environmental degradation that reduced the capacity for subsistence living [14], led to more and more Māori becoming dependent on the labour market for income. Discrimination in the education sector [15], housing sector [16], and labour market [17] also made (and continue to make) Māori more vulnerable to economic shocks. During the mid 1980s and '90s, this was compounded by the neoliberal restructuring of New Zealand's economy, and state infrastructure. Māori unemployment soared, leaving large numbers of families reliant on benefits to survive. At the same time, severe welfare cuts were instituted, entrenching poverty among sole-parents and children reliant on benefit recipients [18]. As New Zealand achieved the unenviable distinction of the steepest increase in income inequality in all developed countries [18], youth suicide, previously rare among Māori [19], reached epidemic proportions, and Māori life expectancy stalled [20]. Three important modifiable factors that contribute to income disparities are growing inequalities in wages, wealth, and changes in the way we redistribute resources (taxes and welfare). The political influence of the wealthy is evident in the removal of inheritance taxes and gift duties, the flattening of New Zealand's tax rates [8] and the laissez faire approach to tax fraud (or evasion as it is euphemistically termed) that costs the country up to $7 billion (estimated total) compared to the punitive approach to benefit fraud (worth $80 million –just over one percent of tax fraud.[21]

Figure 17 in this report shows that average hourly earnings have increased only 18% since 1975 while GDP per capita over three times that amount (60%). This implies that more and more of the nation's wealth is going to capital rather than labour, and that workers need to work more hours to achieve the same weekly income. Of course an averages mask inequalities and the fact that average salaries of those at the top increased rapidly over this period, with the average salary of the top 1% reaching nine times the average of the bottom 90% in 2012.[22] The impact of wage inequalities is magnified for Māori families. The average hourly earnings of Māori wage earners is more than $5 lower than that of Pākehā[23] and the Treasury reports that about 60% of Māori (and Pacific) wage earners earn below the Living Wage ($18.40 per hour).[9] Sole parents are over-represented among those who earn less than $15 per hour.[9]

According to Rashbrooke[24] low wages are the result of multiple factors including the wage freezes of the early 1980s, deregulation and globalisation moving jobs offshore, high unemployment creating competition for jobs, and weakened unions. An International Monetary Fund study found that erosion in union membership in NZ explained a seven percentage point increase in the income shares of the top tenth (a much higher increase than in other countries), due to reduced bargaining power and diminished political influence on redistribution policy.[25] Rosenberg estimates this represents a loss to wage earners of $10,000 per wage earner per year.[22]

Wage inequalities contribute to wealth inequalities as those with the highest salaries have the ability to save and build assets. Housing and property are the major sources of household wealth in New Zealand and housing has a central role in child health inequalities. Low home ownership levels among Māori families put children at increased risk of transience. Unplanned changes of school interrupt a child's education, continuity of primary health care provider is affected, social networks are fragmented, and the quality of the house is not under the control of the family. The high costs of housing contribute to income poverty and material deprivation. And on the other side of the coin, those who own houses or other properties are better off, conferring intergenerational advantage to their children, and annual increases in capital value beyond the owner's total salary.[26] The OECD notes that the lack of a capital gains tax in New Zealand 'exacerbates inequality (by reducing the redistributive power of taxation)', and undermines housing affordability by encouraging speculative housing investment.[10]

As Rashbrooke argues, individual successes are built on communal foundations – "someone who has started up a successful business will also have driven on roads that everyone funded and others built; they will employ a workforce educated at the taxpayer's expense, use

healthcare that the' public provides, transmit information through government-owned telecommunications networks"[8 page 48] The high Māori child poverty rates of today are even more poignant in view of the disproportionate contribution of Māori land for public works, roads, schools, hospitals, railways, and ports.

Many policy options for reducing inequalities in wealth and income have been proposed.[8] Some include: changes to the tax structures to increase redistributive power;[10] realigning the social security framework to align with 21st Century conditions;[21] moving towards 'asset based welfare;[24] changing the way we manage housing and property development;[26] and emphasising a whanau-centric approach to economic development.[27]

So what do tikanga Māori (tools of thought and understanding) bring to this issue? As Joe Williams explains on page 4 of his article, whanaungatanga (or kinship) is at the heart of the 'first law' of Aotearoa, and its natural off-shoot, kaitiakitanga.

> "This is the idea that any right over a human or resource carries with it a reciprocal obligation to care for his, her or its physical and spiritual welfare. … The point is that whanaungatanga was, in traditional Māori society, not just about emotional and social ties between people and with the environment. It was just as importantly about economic rights and obligations."[13]

Our tax, welfare, financial and social policies need to resurface and reinforce the values of whanaungatanga and kaitiakitanga to ensure the wealth holders of Aotearoa, fulfil their obligations to past generations that contributed to their fortunes, and ensure the children and youth of today and tomorrow have the best prospects for fulfilling their potential. The whole of society gains when all children have equitable access to excellent education, healthy secure housing, safe environments to live, learn and play, and opportunities to fully participate in the economic, social and cultural life of the nation.

REGIONAL DEMOGRAPHIC PROFILE

INTRODUCTION TO REGIONAL DEMOGRAPHY

While it is not always explicitly stated, much of the interest in monitoring Māori health status in recent years is related to benchmarking, and the desire to assess changes in health disparities between Māori and other New Zealanders based on a basket of key indicators. The ability to undertake such analyses in a robust manner and in a way that simultaneously takes into account differences in population age structure, geography and socioeconomic deprivation, although possible, is technically difficult as a result of the fragmented nature of New Zealand's national datasets and the lack of appropriate denominators in electronic format.

At the national level, what is often needed for planning purposes is not an adjusted analysis, where the effects of each of these factors have been discounted, but rather an overview of crude rates for Māori, with consideration then being given to why these rates might differ from the national average. As a consequence, the report which follows uses unadjusted / crude rates to provide an overview of morbidity and mortality for Māori children and young people. In interpreting these crude rates, a knowledge of national demography is essential, as well as an understanding of the ways in which the underlying determinants of health, such as socioeconomic deprivation, influence health outcomes at the population level. It is suggested that when reading the sections which follow, the reader considers the answers to the following questions:

What are the characteristics of the Māori child and youth populations in terms of age structure, place of living and exposure to socioeconomic disadvantage? (This information is provided in the current section on Regional Demography).

For each health issue under review, how might this demographic profile influence the distribution of health outcomes at the population level?

What are the actual rates for the health issue in question and do they differ in any way from those which might be predicted based on an understanding of the demographic profile?

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

Data source and methods

Definition
Distribution of the Māori child and youth population by age and NZ Deprivation Index decile
Data Sources
Statistics New Zealand: 2013 Census

Notes on interpretation of data
Note 1: New Zealand's national health datasets have traditionally continued to use the previous Censuses' domicile codes for ≈ 2 years after any new Census, meaning that all of the information derived from the Birth Registration dataset is based on 2006 domicile codes and the NZDep2006 Index. In addition, NZDep is assigned on the basis of Domicile Code / Census Area Unit (≈1-2,000 people), so in regions where there appear to be no births in e.g. decile 10 areas, there still may be babies born into, for example, decile 10 meshblocks (smaller areas of ≈100 people). When these smaller meshblocks are aggregated into larger census area units, they collectively fail to achieve an overall decile 10 score.
Note 2: unless otherwise specified, total response ethnicity has been used to identify Māori children and young people (i.e. those identifying as Māori in any of their first three ethnic groups). In contrast, 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 3: Tests of statistical significance have not been applied to the data in this section, so any associations described do not imply statistical significance or non-significance.

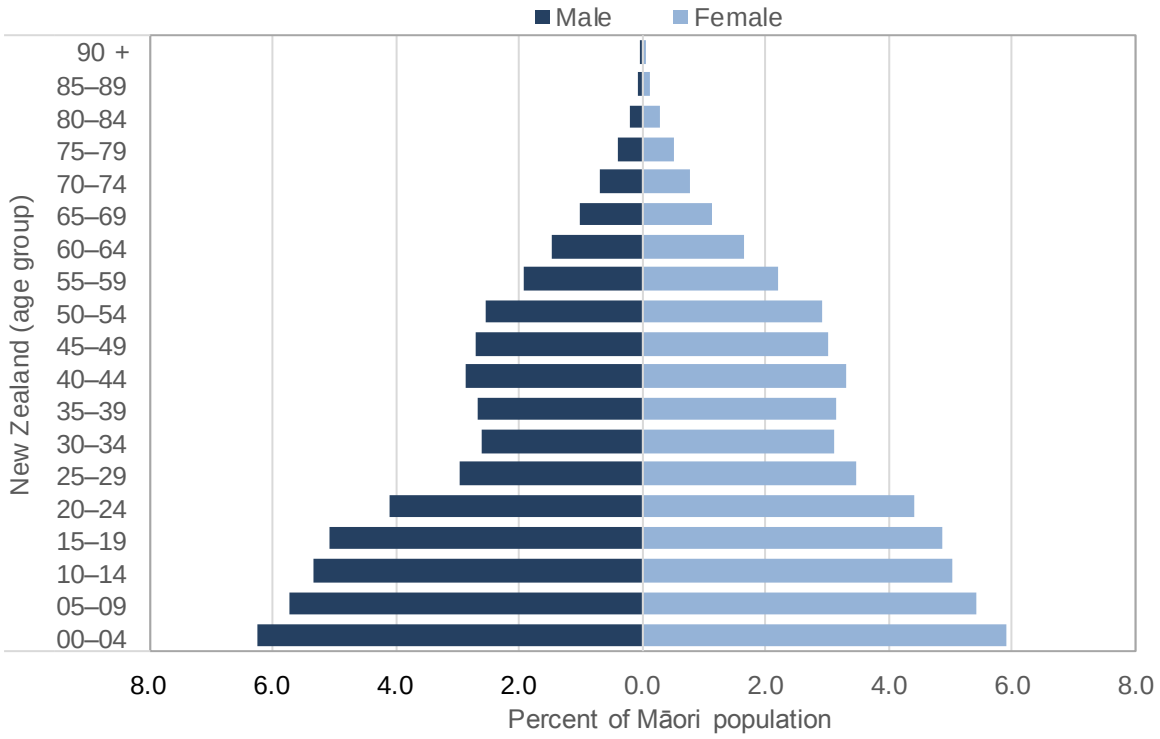
2013 census population profiles

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

Age distribution

At the 2013 census, children and young people comprised 52.1% of the Māori population. The age group that constituted the highest proportion of the Māori population was the 0–4 year old age group, followed by the 5–9 year olds (**Figure 1**).

Figure 1. Māori population distribution at 2013 census by age group



Source: Statistics New Zealand

Distribution by NZ Deprivation Index decile

In New Zealand in 2013, the proportion of Māori children and young people living in each decile increased with increasing deprivation from 3.8% in the least deprived areas (NZDep decile 1) to 21.9% in the most deprived areas (decile 10). In contrast, the population of non-Māori non-Pacific children and young people was much more evenly spread across the deciles. The proportions living in each of the middle deciles (decile 3 to 8) were fairly similar (in the range 9.5% to 11.0%) with slightly higher proportions living in deciles 1 (11.3%) and 2 (12.4%) and somewhat lower proportions living in deciles 9 (9.0%) and 10 (5.5%) **(Figure 2**).

Māori and non-Māori child and youth populations at the 2013 census

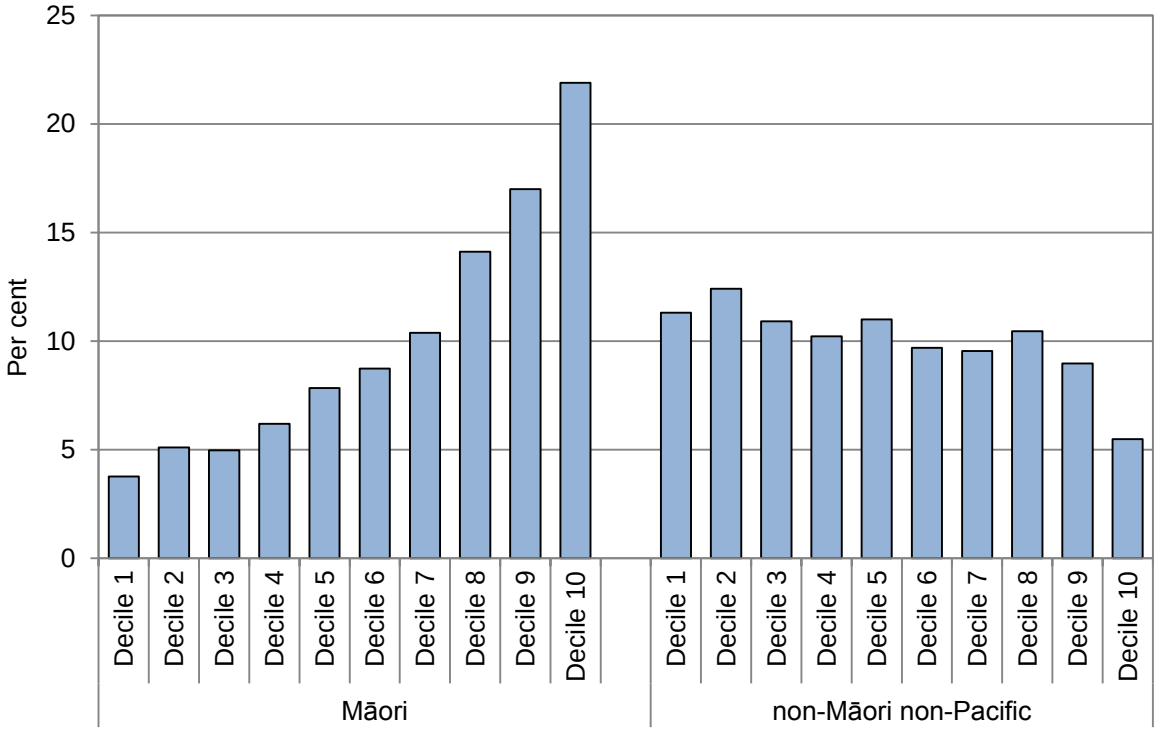
In this report, most of the comparisons presented compare Māori children and young people's data with that for non-Māori non-Pacific children and young people. For this reason **Table 2** has been provided to indicate the size of the Māori and non-Māori non-Pacific child and youth populations and the percentages of the total New Zealand child and youth population who belong to these ethnic categories. At the 2013 census, there were 233,000 Māori children making up 25.6% of the total New Zealand child population, and 127,750 Māori young people making up 20.4% of the total New Zealand youth population.

Distribution by DHB

At the 2013 census there were wide variations between DHBs in the number and proportion of resident children and young people who were identified as Māori. The DHB with the highest number of Māori children was Waikato and the DHB with the lowest was West Coast (**Table 3).** The DHB with the highest percentage of children identified as Māori was Tairawhiti (65%) and the DHB with the lowest was Auckland (12.8%).

The DHB with the highest number of Māori young people was Waikato and the DHB with the lowest was West Coast. The DHB with the highest percentage of young people identified as Māori was Tairawhiti (60.8%) and the DHB with the lowest was Auckland (10.4%) (**Table 4**).

Figure 2. Distribution of Māori children and young people (0–24 years) at the 2013 Census by NZ Deprivation Index decile, compared to non-Māori non-Pacific children and young people



Source: Statistics New Zealand

Table 2. Māori and non-Māori child and youth populations at the 2013 census

Prioritised ethnic group	Number of children aged 0−14 years	% of all NZ children aged 0–14 years	Number of young people aged 15–24 years	% of all NZ young people aged 15–24 years
Māori	233,000	25.6	127,750	20.4
non-Māori non-Pacific	588,010	64.7	445,600	71.0

Source: Statistics New Zealand Note: Ethnicity is total response.

Table 3. Distribution of Māori children aged 0-14 years at the 2013 census by District Health Board

District Health Board	Māori		non-Māori non-Pacific		Total
	Number	Per cent	Number	Per cent	
Children aged 0–14 years					
Northland	18,850	51.7	16,590	45.5	36,440
Waitemata	18,650	16.5	82,440	72.9	113,130
Auckland	10,670	12.8	57,330	69.0	83,100
Counties Manukau	28,610	24.0	55,890	46.9	119,280
Waikato	29,090	35.4	49,810	60.7	82,060
Bay of Plenty	18,230	40.0	26,050	57.2	45,560
Lakes	11,830	50.6	10,740	45.9	23,380
Tairawhiti	7,600	65.0	3,650	31.2	11,690
Taranaki	7,180	29.8	16,440	68.3	24,070
Hawke's Bay	13,730	39.6	19,000	54.8	34,640
MidCentral	11,070	32.3	21,630	63.1	34,260
Whanganui	5,160	39.9	7,180	55.5	12,940
Hutt	7,930	26.5	18,770	62.6	29,980
Capital & Coast	10,100	18.4	39,040	71.0	54,950
Wairarapa	2,430	28.9	5,610	66.6	8,420
Nelson Marlborough	4,790	17.8	21,560	79.9	26,970
South Canterbury	1,590	15.0	8,790	83.1	10,580
Canterbury	14,410	15.2	76,840	81.0	94,830
West Coast	1,180	18.8	4,870	77.5	6,280
Southern	9,870	17.5	44,680	79.4	56,260
New Zealand	233,000	25.6	588,010	64.7	908,770

Source: Statistics New Zealand Note: Ethnicity is total response.

Table 4. Distribution of Māori young people aged 15-24 years at the 2013 census by District Health Board

District Health Board	Māori		non-Māori non-Pacific		Total
	Number	Per cent	Number	Per cent	
Young people aged 15–24 years					
Northland	9,150	47.0	9,730	50.0	19,450
Waitemata	10,500	13.6	59,610	77.0	77,380
Auckland	7,770	10.4	56,840	76.3	74,530
Counties Manukau	14,860	19.4	41,250	54.0	76,420
Waikato	16,000	29.4	36,410	67.0	54,350
Bay of Plenty	8,930	35.3	15,660	61.9	25,280
Lakes	6,230	46.7	6,560	49.1	13,350
Tairawhiti	3,870	60.8	2,220	34.9	6,360
Taranaki	3,560	25.9	9,940	72.2	13,760
Hawke's Bay	6,960	35.5	11,560	59.0	19,580
MidCentral	6,280	24.9	17,870	70.8	25,240
Whanganui	2,860	36.8	4,580	58.9	7,770
Hutt	4,230	22.5	12,510	66.5	18,820
Capital & Coast	6,800	14.6	35,640	76.7	46,480
Wairarapa	1,320	27.5	3,220	67.1	4,800
Nelson Marlborough	2,480	16.5	12,160	80.9	15,030
South Canterbury	790	12.1	5,560	85.3	6,520
Canterbury	8,600	12.1	60,140	84.5	71,160
West Coast	620	16.8	2,940	79.9	3,680
Southern	5,980	12.7	40,160	85.0	47,270
New Zealand	127,750	20.4	445,600	71.0	627,410

Source: Statistics New Zealand Note: Ethnicity is total response.

Regional births

The following section provides an overview of Māori births in New Zealand by NZ Deprivation Index decile, maternal age and District Health Board using information from the Birth Registration Dataset.

Data sources and methods

Indicator

1. Distribution of Live Births by Ethnicity, NZ Deprivation Index Decile and Maternal Age
Numerator: Birth Registration Dataset

Notes on Interpretation

Note 1: In this analysis, NZDep2006decile has been assigned on the basis of Domicile Code / Census Area Unit (CAU ≈1,000–2,000 people). In regions where there are no births in e.g. decile 10 areas, there still may be babies born into e.g. decile 10 meshblocks (smaller areas of ≈100 people). When these smaller meshblocks are aggregated into larger CAUs however, they may collectively fail to achieve an overall decile 10 ranking.
Note 2: The number of births presented here may vary slightly from previous years, as the Ministry of Health no longer provides information on stillbirths in the Birth Registration Dataset due to concerns about data quality. Thus the current analysis is restricted to live births (as compared to total births (including stillbirths) which were presented in previous years).
Note 3: Year is year of birth registration rather than year of birth.

New Zealand trends

In New Zealand during 2000–2013 the number of Māori births followed a similar trend to the total number of births, generally increasing from 2000 to 2008 and then generally falling. The percentage of all New Zealand live births who were identified as Māori fluctuated between 27% and 30% (**Table 5**).

Table 5. Number of Māori live births, New Zealand 2000–2013

Year	Number of Māori births	% of all births who were identified as Māori	Total New Zealand births
New Zealand			
2000	15,867	28	56,994
2001	15,869	28	56,224
2002	14,905	27	54,515
2003	15,682	28	56,576
2004	16,520	28	58,723
2005	17,004	29	58,727
2006	17,935	30	60,274
2007	19,338	30	65,121
2008	19,452	30	65,333
2009	18,470	29	63,285
2010	18,893	29	64,699
2011	18,034	29	62,174
2012	17,948	29	62,035
2013	17,149	29	59,701

Source: Birth Registration Dataset. Note: Year is year of birth registration; ethnicity is based on total response

Distribution by DHB

In New Zealand during 2013 the number of Māori babies born varied by DHB with the Counties Manukau DHB having the highest number of Māori babies registered and the West Coast DHB having the lowest. The DHB with the highest percentage of babies registered as Māori was Tairawhiti (68.3%), and the DHB with the lowest was Auckland DHB (13.8%) (**Table 6**).

Table 6. Distribution of Māori live births by District Health Board, New Zealand 2013

District Health Board	Māori		non-Māori non-Pacific		*Total number of births
	Number of births	Percent of births	Number of births	Percent of births	
Northland	1,363	62.1	784	35.7	2,196
Waitemata	1,381	18.0	5,437	70.8	7,677
Auckland DHB	859	13.8	4,223	68.0	6,214
Counties Manukau	2,250	26.9	3,530	42.3	8,349
Waikato	2,082	39.4	3,001	56.8	5,285
Bay of Plenty	1,295	46.2	1,416	50.5	2,806
Lakes DHB	833	56.4	596	40.3	1,478
Tairawhiti	488	68.3	210	29.4	714
Taranaki	517	34.0	980	64.4	1,522
Hawke's Bay	1,042	47.1	1,035	46.8	2,211
MidCentral	788	36.7	1,249	58.2	2,145
Whanganui	420	48.4	422	48.7	867
Hutt Valley	593	31.2	1,106	58.1	1,903
Capital & Coast	750	20.6	2,479	68.2	3,636
Wairarapa	174	35.0	311	62.6	497
Nelson Marlborough	340	21.9	1,166	74.9	1,556
South Canterbury	126	20.0	480	76.3	629
Canterbury	1,047	17.6	4,611	77.6	5,940
West Coast	87	22.2	293	74.7	392
Southern	693	19.9	2,645	76.1	3,476
New Zealand	17,128	29	35,974	60	59,493

Source: Birth registration dataset; Note: *Total: Some totals may differ due to a small number of births with missing information; ethnicity is based on total response

THE WIDER MACROECONOMIC AND POLICY CONTEXT

CHILD POVERTY AND LIVING STANDARDS

CHILD POVERTY: MEASUREMENT AND POLICY SOLUTIONS

"Children living in poverty are those who experience deprivation of the material resources and income that is required for them to develop and thrive, leaving such children unable to enjoy their rights, achieve their full potential and participate as equal members of New Zealand society" OCC EAG on Solutions to Child Poverty 2012 [28].

Material deprivation or hardship measures relate to a family's living standards and the degree to which a family must do without things that are important for a good quality of life, for example fruit and vegetables, shoes and clothing, or heating, in order to make ends meet [29].

Income measures are based on a family's disposable income (i.e. after-tax market income, plus social assistance, including Working for Families tax credits) adjusted for family size and composition. Income poverty thresholds are traditionally set at a proportion of the national median household income, for example at 60% of the median household equivalent disposable income, after adjusting for housing costs. The median income is the mid-point of the distribution of all incomes in New Zealand, so that half the number of households have income below that point, and half above [28,29].

This report includes two types of income poverty threshold. The first, the standard relative income poverty measure, compares incomes to 60% of the median in the current year. This measure is usually referred to as a relative, moving-line or relative-to-contemporary median measure. The second income measure compares current incomes (expressed in the dollar value of a particular year, known as the reference year) to 60% of the median income in the reference year (e.g. 2007). This is often referred to as a fixed line measure [28,29].

Each group of poverty measures captures a slightly different facet of economic wellbeing.

In recognition of this fact, in its report on Solutions to Child Poverty, the EAG [28] recommended that the Government monitor at least five different poverty measures:

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

These five measures were selected because the EAG [28] believed it was important not only to assess families' incomes, but also their day to day living standards. Measures of poverty severity and persistence were considered to be important because poverty is likely to have a greater impact on child outcomes when it is severe, or lasts for a long time. The following sections review the data currently available in the New Zealand for each of these measures of child poverty.

CHILD POVERTY: INCOME-BASED MEASURES

Introduction

The following section uses information from the NZ Household Economic Survey (NZHES) to review the proportion of children aged 0–17 years living in households with incomes below the 60% income poverty threshold (after tax, and adjusting for family size and composition) [30]. The NZHES report provides only limited analyses by ethnic group due to the relatively small numbers of people in the survey who belonged to Māori, Pacific or other ethnic groups. Housing costs can consume a significant proportion of a family's income so an after housing costs (AHC) income measure provides a good picture of the resources available for other necessary spending.

Background

In New Zealand, the Ministry of Social Development uses a range of income-based measures to monitor child poverty. All are based on a family's disposable income (i.e. market income, less tax, plus social assistance). This income has been equivalised: that is, adjusted for family size and composition. An income poverty threshold commonly used is a household equivalent disposable income of less than 60% of the median, after adjusting for housing costs. Two measures are used: the relative or standard measure that is calculated using the contemporary median income, and a fixed-line measure, which compares income to the median at a fixed point in time (1998 or 2007 in this report) [30].

Data source and methods

Indicator

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

Data source

New Zealand Household Economic Survey (NZHES n=2,800–3,500 households per survey) via Perry 2014 [30]. Note: Child Poverty measures are reported on by the Ministry of Social Development using NZHES data [30] which it reports 2-yearly from 1982–1998, and 3-yearly thereafter. Since 2007, income data have been reported annually through the new HES Incomes Survey. The full NZHES (including expenditure data) remains 3-yearly. For more detail on methodology see Perry 2014 [30].

Notes on interpretation

Note 1: Child poverty measures traditionally compare a household's income to the national median rather than the mean. The median is calculated by assigning individuals the income of their household, ranking them from those with the lowest to the highest income, and then finding the middle point of the income distribution. The mean income is usually higher than the median because a few households with a very high income will shift the mean upwards, but not the median. The number of very high income households varies from year to year so the mean is a less stable measure than the median. For more detail see Perry 2014 [30].

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

In his 2014 update, Perry [30] notes that in real terms, the median income in 1998 was similar to 1982 so there is a good case for using 1998 as the reference year for fixed-line poverty calculations back to 1982, as well as forward from 1998. By 2007, however, the median was 16% higher than in 1998 and by 2009 26% higher, hence the reference year was changed to 2007.

Note 3: While reporting fixed-line poverty figures back to 1982 using 2007 as the reference tells us what proportion was 'poor' back then relative to 2007, this approach is not useful for assessing the extent of hardship 'back then' relative to the standards of the day. In the analyses which follow, 2007 fixed-line figures are provided from 2007 onwards, with earlier years using 1998 as the reference year.

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

The number of children living in poverty in New Zealand

In 2013 in New Zealand, 260,000 (24%) dependent children aged 0–17 years were living in relative poverty using the measure of below 60% of the contemporary median income, after housing costs (**Table 7**). If a fixed-line measure is applied (in this case, below 60% of the 2007 median income), 230,000 (22%) of dependent children aged 0–17 years were living in poverty in 2013 (**Table 7**).

Table 7. Number and proportion of dependent children aged 0–17 years living below various poverty thresholds, New Zealand 2001–2013 HES selected years

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

Source: Perry 2014 [30], derived from Statistics New Zealand Household Economic Survey (HES) 1982–2013

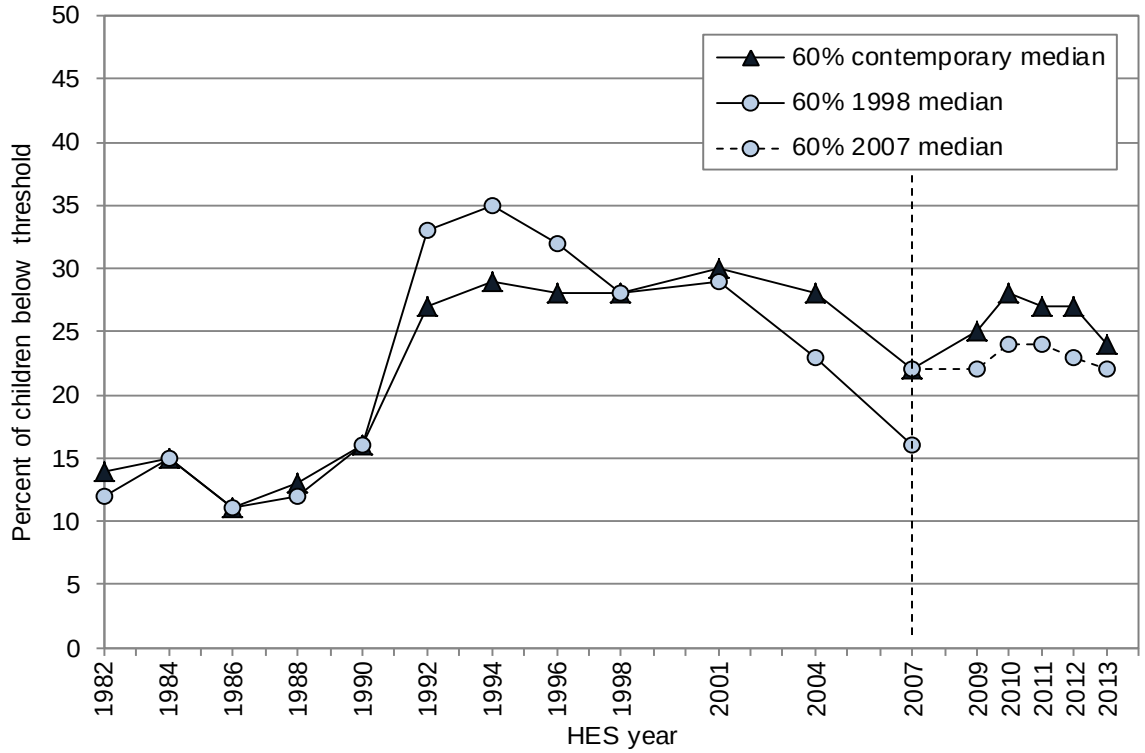
Child poverty trends using different measures

Relative or fixed-line poverty

Information about people in lower income households is gained from examining relative poverty measures (using the contemporary median) or fixed-line or constant value poverty measures (using 1998 or 2007 as the set points in time) with each method providing a different perspective [30] (see Methods box above).

Both relative and fixed-line measures show the rapid rise in child poverty in New Zealand during 1990–1992 that has been attributed to rising unemployment and cuts made to benefits in 1991 [30]. During 1992–1998, child poverty declined as a result of falling unemployment and the incomes of those around the poverty line rose more quickly than the median. After 1998, as economic conditions improved, the median income rose again. Incomes for many low-income households with children did not, however, and child poverty rates continued to rise until 2004. The decline in poverty rates from 2004 to 2007 resulted from the Working for Families package [30]. Between 2007 and 2010 child poverty rates increased, then declined, so that in 2013 the rates were nearly equal to those in 2007 (**Figure 3**).

Figure 3. Proportion of dependent children aged 0–17 years living below the 60% income poverty threshold (relative and fixed-line) after housing costs, New Zealand 1982–2013 HES years



Source: Perry 2014 [30], derived from Statistics New Zealand Household Economic Survey (HES) 1982–2013

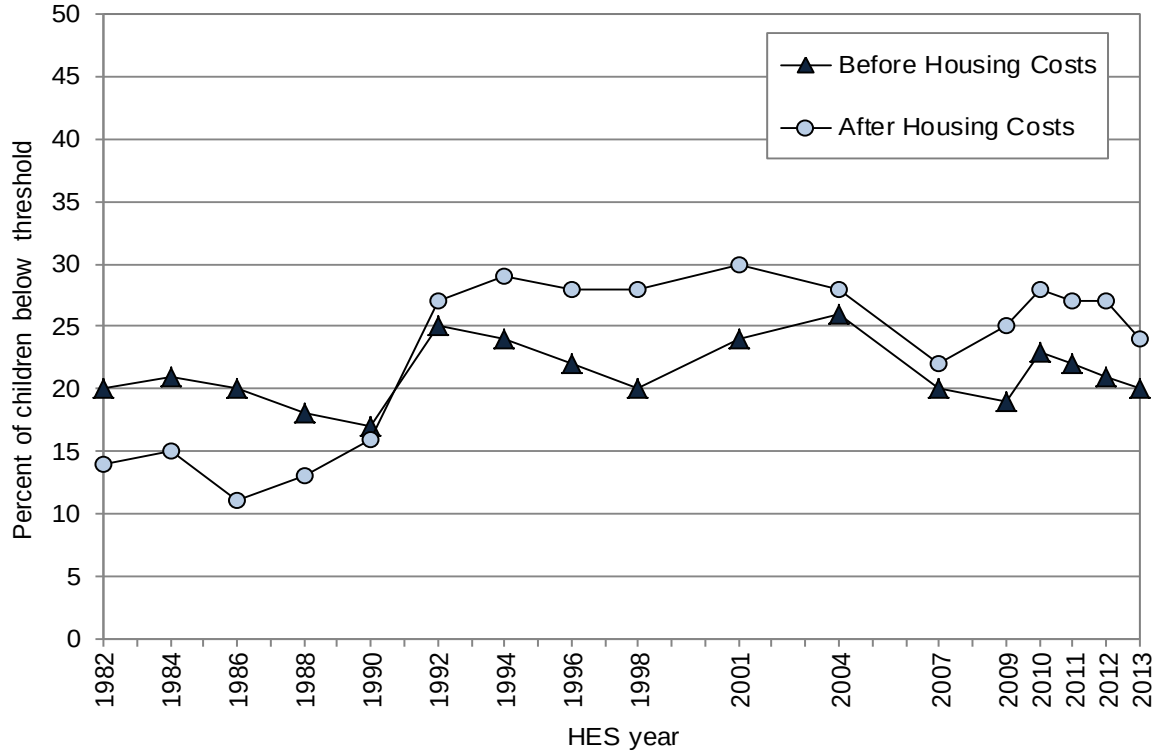
Before Housing Costs (BHC) or After Housing Costs (AHC)

Housing costs can be a substantial component of a household's expenditure. **Figure 4** shows the proportion of children living in households below the relative poverty threshold (<60% of contemporary median) before housing costs (BHC) and after housing costs (AHC) have been accounted for. The proportion shown BHC fluctuated in 1982–2013, but in the years 1982 and 2013, 20% of children were below the poverty threshold. In comparison, the proportion of children below the threshold after housing costs (AHC) was lower than for the BHC proportion in 1982. AHC then shared the same rapid rise in 1990 as the BHC, but rose further from 1992 onwards and remained higher even after a decline between 2001–2007 and again between 2010–2013 (**Figure 4**).

Housing costs in 2012 accounted for a higher proportion of household expenditure for low-income households than such costs in the 1980s. In 1988, 17% of households in the lowest income quintile spent more than 30% of their income on housing in 1994 this was the highest at 52% of households, and in 2007, 39% of households [30]. Perry noted that the income-related rental policies introduced in 2000, along with later changes to accommodation supplements (AS), helped reduce housing expenditure for some low income households. These changes contributed to reductions in AHC child poverty during 2001–2007. There were no further policy changes during 2007–2012 and maximum rates of assistance remaining fixed although housing costs continued to increase [30]. This resulted in increases in the AHC child poverty rates during 2007–2010 (**Figure 4**).

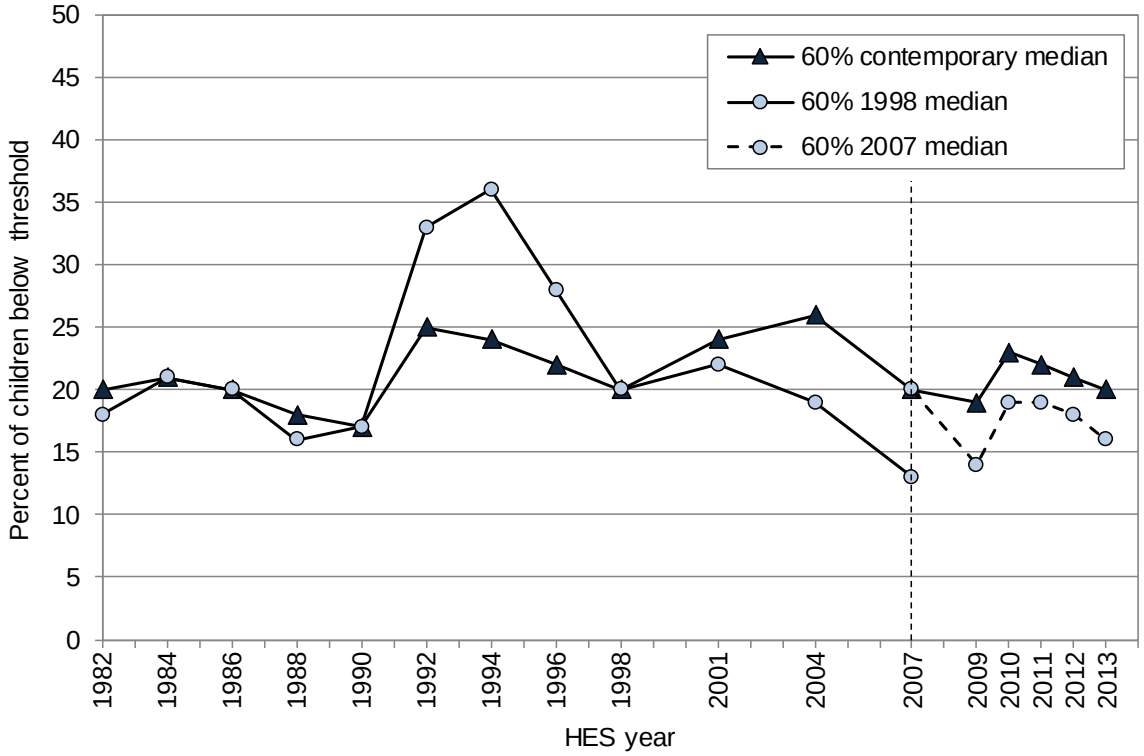
Similar changes are seen using a fixed line poverty measure. The AHC trend for the fixed line poverty threshold (<60% 1998 median) during 1984–2008 (**Figure 3**), was broadly similar to that of the BHC trend (**Figure 5**) with the AHC poverty rate in 2007 being just a little higher than the AHC rate in the 1980s (**Figure 3**).

Figure 4. Proportion of dependent 0–17 year olds living below the 60% income poverty threshold (relative) before and after housing costs, New Zealand 1982–2013 HES years



Source: Perry 2014 [30], derived from Statistics New Zealand Household Economic Survey (HES) 1982–2013

Figure 5. Proportion of dependent children aged 0–17 years living below the 60% income poverty threshold before housing costs, New Zealand 1982–2013 HES years



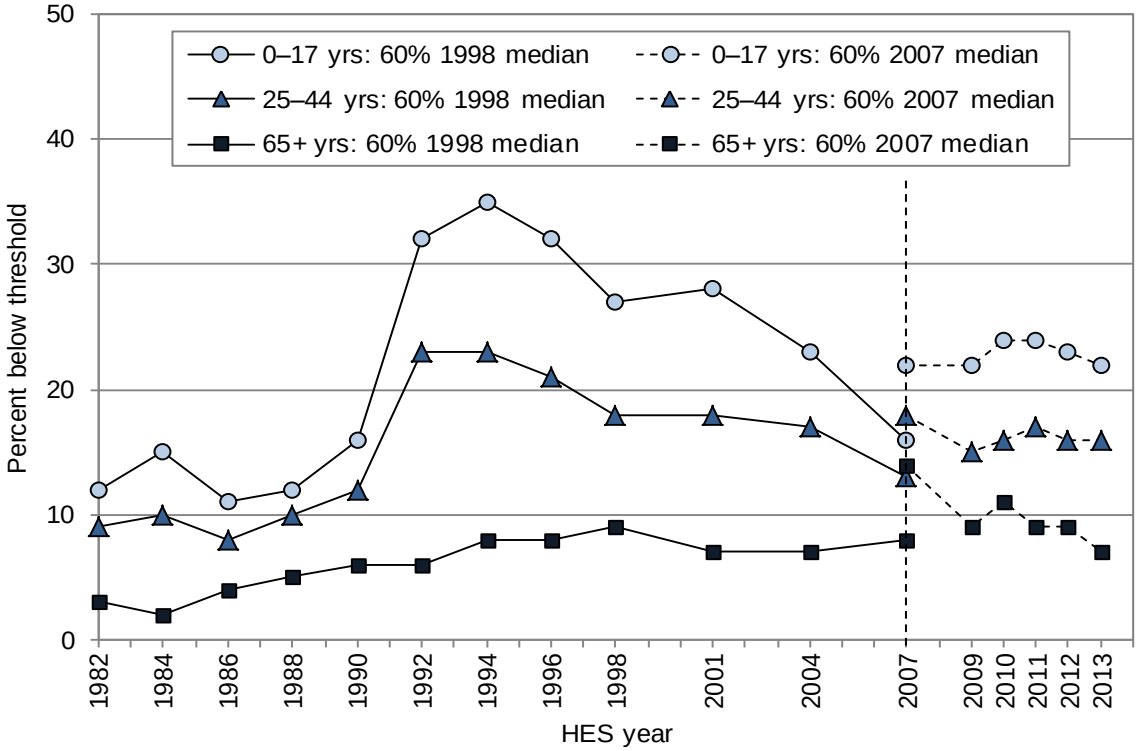
Source: Perry 2014 [30], derived from Statistics New Zealand Household Economic Survey (HES) 1982–2013

Child poverty and demographic factors

Poverty by age

In 2013, children aged 0–17 years were three times more likely to be in poverty than those aged 65+ years. During 1982–2013, poverty rates in New Zealand were consistently higher for children aged 0–17 years than for adults aged 25–44 years with the lowest poverty rates being seen amongst those aged 65+ years (**Figure 6**).

Figure 6. Proportion of population living below the 60% income poverty threshold after housing costs by selected age-group, New Zealand 1982–2013 HES years



Source: Perry 2014 [30], derived from Statistics New Zealand Household Economic Survey (HES) 1982–2013

Child poverty by ethnicity

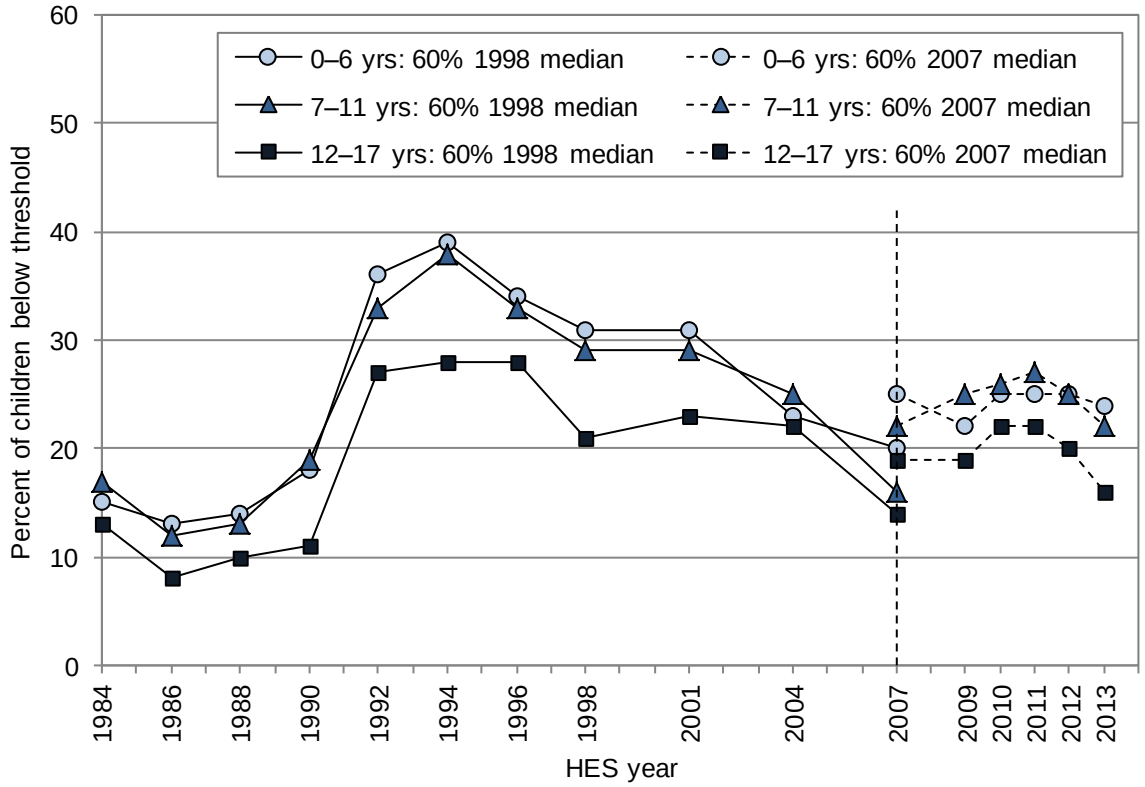
Over the period 2011–2013, on average, around 34% of Māori children lived in poor households, compared to an average of 16% of European children (using the AHC 60% fixed-line measure) [30]. The higher poverty rates seen in Māori children potentially reflect the relatively high proportion of Māori children living in sole parent beneficiary households (during 2007 to 2011 around 43% of domestic purpose benefit (DPB) recipients were Māori) [30].

No time series data are available for ethnicity but Perry reports that poverty rates for Māori children are consistently higher than for European children [30]. Limited analyses by ethnic group are reported in the NZHES [30] because of the relatively small sample sizes.

Child poverty by children's age

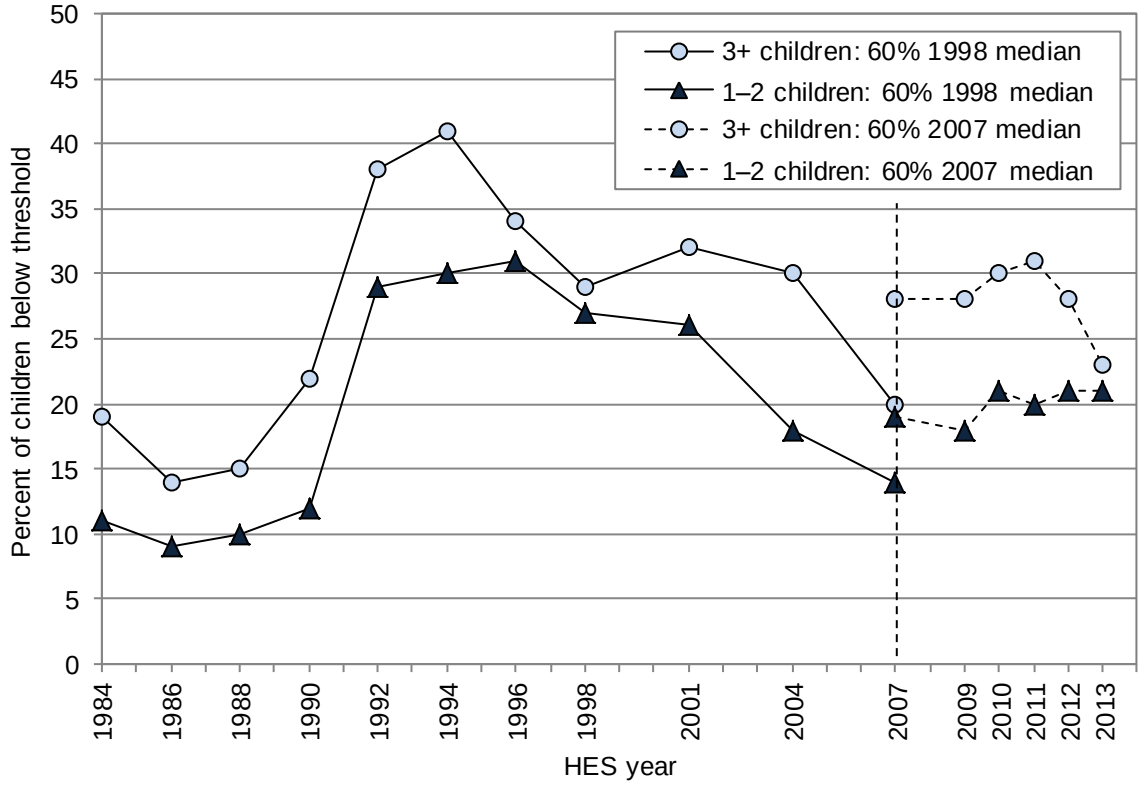
In New Zealand throughout 1984–2013, poverty rates for younger children (0–6 years and 7–11 years) were generally higher than for older children (12–17 years) (**Figure 7**).

Figure 7. Proportion of dependent children aged 0–17 years living below the 60% income poverty threshold after housing costs by age, New Zealand 1984–2013 HES years



Source: Perry 2014 [30], derived from Statistics New Zealand Household Economic Survey (HES) 1984–2013

Figure 8. 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 1984–2013 HES years



Source: Perry 2014 [30], derived from Statistics New Zealand Household Economic Survey (HES) 1984–2013

Child poverty by number of children in household

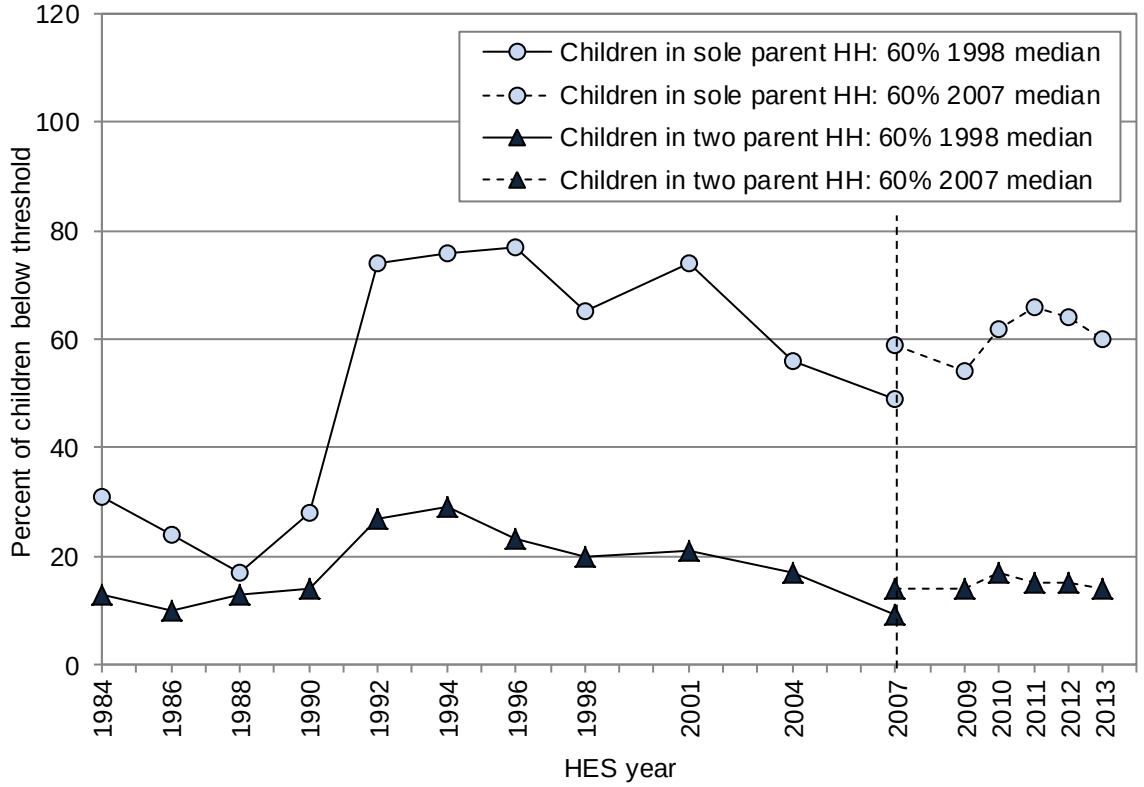
In New Zealand during 1984–2013, child poverty rates for households with three or more children were consistently higher than for those with one or two children (**Figure 8**).

Child poverty by family type

In 2011–2013, on average, 63% of children living in sole parent families were living in poverty compared to 15% of children of two parent families (**Figure 9**). The majority of New Zealand children lived in two parent families (76%) compared to 16% in sole parent families on their own. Perry identified that 53% of children in poverty were in sole parent families and 47% in two parent households [30]. Perry also noted that children living in multi-adult family households have lower poverty rates than those living in sole parent households [30].

Historically, poverty rates for children in both sole parent and two-parent families declined between 2001 and 2007 in New Zealand. In 2007, however, rates for children in sole-parent families remained higher than their 1980s levels while rates for children in two-parent families were similar [30].

Figure 9. Proportion of dependent children aged 0–17 years living below the 60% income poverty threshold after housing costs by household type, New Zealand 1984−2013 HES years



Source: Perry 2014 [30], derived from Statistics New Zealand Household Economic Survey (HES) 1984–2013

Child poverty by work status of adults in household

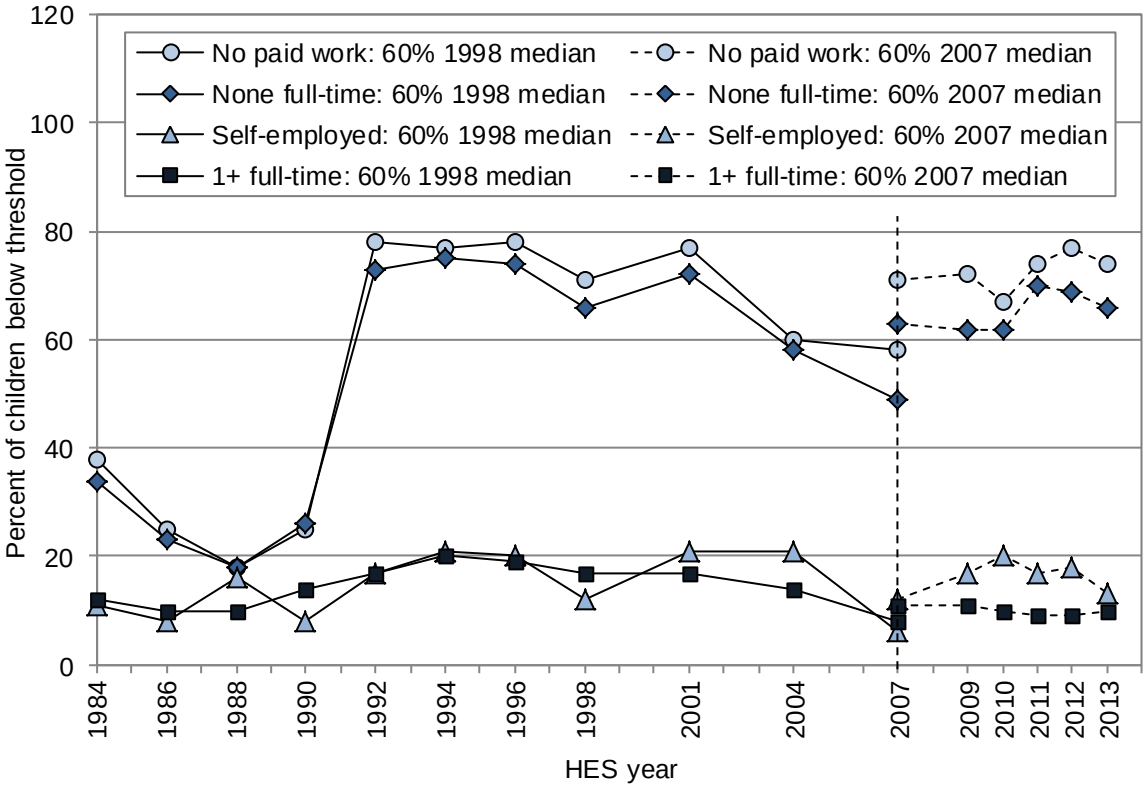
From 2011 to 2013, on average, around 37% children who were living in households below the fixed line <60% median poverty threshold AHC came from working families (down from one in two (52%) in 2004 before Working for Families) while 63% were in families reliant on a benefit income [30].

Perry notes that from 1992 to 2004, children in households with no adults in paid work generally had poverty rates around four times higher than for those in households where at least one adult worked full-time. From 2007 to 2013, the difference was even greater—around six to seven times higher for children in households where no adults were in paid work [30].

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

Figure 10).

Figure 10. 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 1984–2013 HES years



Source: Perry 2014 [30], derived from Statistics New Zealand Household Economic Survey (HES) 1984–2013

CHILD POVERTY: MATERIAL HARDSHIP

Introduction

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

Background

The Ministry of Social Development (MSD) uses non-income measures to assess the material wellbeing of families with children, as well as measures of income poverty. The non-income measures provide insight into what hardship looks like for everyday life by indicating families' actual living standards, including their ability to keep the house warm in winter, to afford meat and fresh fruit and vegetables, to replace worn out shoes, clothing, and broken appliances, and to visit the doctor when they need to [30]. MSD monitors these measures using:

1. The New Zealand Household Economic Survey (NZHES) which contains a 40-item Economic Living Standards Index (ELSI) that ranks households from low to high living standards using a range of non-income measures. A short (25 item) form of the ELSI has been included in the NZHES since 2006–07 [30].
2. Material Wellbeing Index (MWI which is a new index developed by MSD that uses 13 of the 25 items from ELSI and 11 new ones [30]. This index was first used to collect data on material hardship in 2012–13. There is considerable similarity on the household rankings between ELSI and MWI. The main differences between the MWI and the ELSI are the removal from the MWI of three items previously included in the ELSI that required a high level self-assessment (of income inadequacy, standard of living and satisfaction with standard of living) and the MWI having greater emphasis on material things that households or families have and activities they could participate in.
3. The Living Standards Surveys (LSS), undertaken nationally by MSD in 2000, 2004 and 2008, provided data on households with children and child specific measures. The 2008 survey collected information from 5,000 households on their material circumstances including ownership and quality of household durables, and their ability to keep the house warm, pay the bills, have broken down appliances repaired and pursue hobbies and other interests [30]. The details of the 2008 Survey are available from earlier MSD reports [31].

New Zealand Household Economic Surveys

Data Source and Methods

Indicator

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

Data Source

New Zealand Household Economic Survey (NZHES) (n=2,800–3,500 households per survey) via Perry 2014 [30].

The MSD developed the 40-item Economic Living Standards Index (ELSI), which ranks households from low to high living standards using a range of non-income measures. A short (25 item) form of the ELSI has been included in the NZHES since 2006–07, with 16 items being used to calibrate a material hardship measure [30]. The MSD has developed the ELSI further with the Material Wellbeing Index (MWI) that retains 13 of the 25 items from the ELSI and adds 11 new ones. These were first collected in HES in 2012−13.The ELSI and MWI rank the population as a whole and the different groups in it in much the same way (correlation of 0.95) [30] and the following 16 items are common to both. There is, however, a discontinuity in the HES-based material hardship measures of 2007–12 (ELSI) and those of 2012−13 (MWI).

Enforced lack of essentials

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

A good bed

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

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

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

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

Financial stress and vulnerability

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

The ELSI hardship threshold was set at 6 or more deprivations out of 16 from the calibration list above. This gave a population hardship rate in 2008 of 12%, which was close to the 2008 income poverty rate (using the more stringent 50% of median AHC threshold) of 13%. For further detail on the methodology used see Perry 2014 [30].

Proportion living in material hardship by age and household type

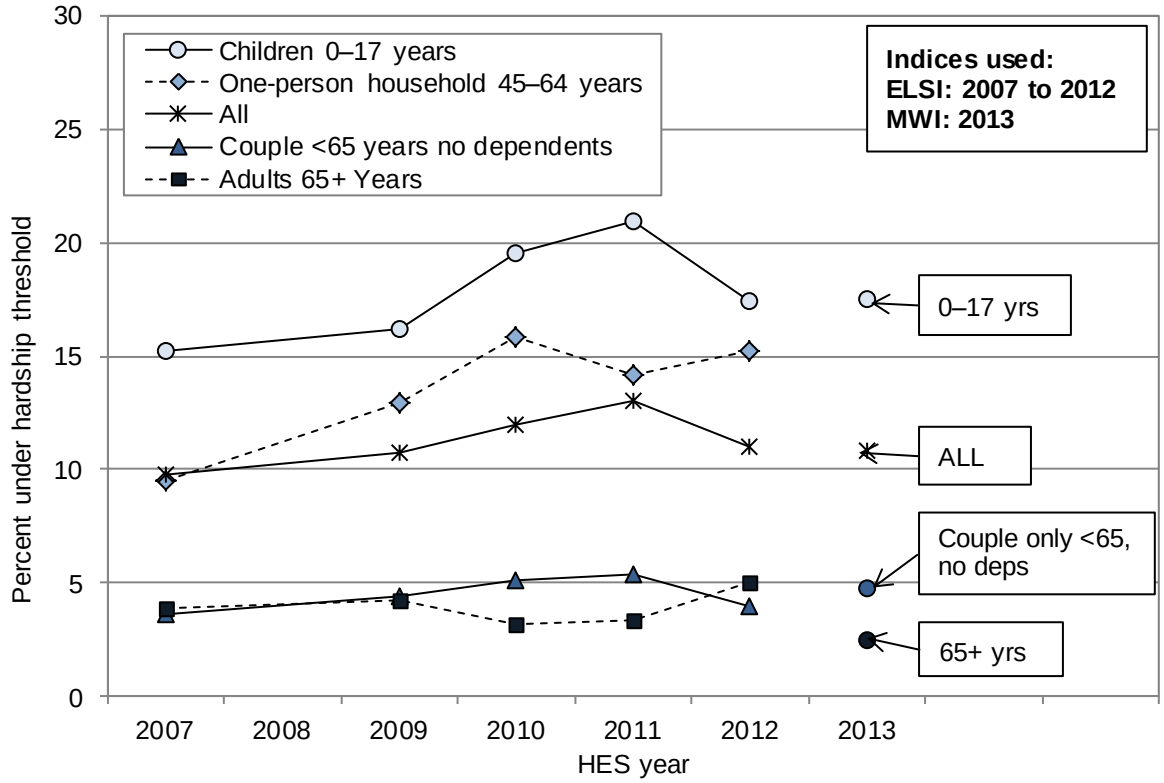
In New Zealand during 2007–2012, material hardship, as defined using the Economic Living Standards Index (ELSI), was consistently highest for households with children aged 0–17 years, followed by one person households aged 45–64 years. The lowest rates of hardship were seen among those aged 65+ years. The proportion of children aged 0–17 years in material hardship in rose from 16% in 2009 to 21% in 2011, before falling to 17% in 2012 (**Figure 11**). In 2012, around 180,000 children were living in material hardship. The Material Wellbeing Index (MWI) and ELSI rank the population in much the same way [30].

Perry notes that the rise in material hardship from 2007 to 2011 for the total population and for children 0–17 years was not unexpected, given the impact of the Global Financial Crisis and economic downturn, and that the improvements seen between 2011 and 2012 reflect the early impacts of the more recent economic recovery [30] (**Figure 11**).

Proportion of children living in material hardship by family income

During 2007–2012, a lower proportion of children with a family income above the 60% poverty threshold (non-income-poor families) lived in material deprivation than did New Zealand children overall. However, material hardship rates rose during 2009–11 both for non-income-poor families and for all families. Perry suggests that a number of families with incomes above the 60% threshold may be in relatively precarious financial circumstances, with small drops in income or unexpected bills potentially making a significant difference to their day-to-day living standards [30].

Figure 11. Proportion living in material hardship, for children 0–17 years and selected sub-groups, New Zealand 2007–2013 HES years



Source: Perry 2014 [30] derived from Statistics New Zealand Household Economic Survey (HES) 2007–2012; Note: Hardship defined using Economic Living Standards Index (ELSI) and Material Wellbeing Index (MWI), see Methods for further detail

2008 Living Standards Survey

In the Living Standards Survey, respondents provided information about themselves and others in their economic family unit including information on specifically child related items [31]. In the Living Standards Survey, material hardship was defined as having a score of four or more "enforced lacks" from a list of 14 items on the material deprivation index outlined in the Methods box.

Data source and methods

Definition

Proportion of children aged 0–17 years experiencing material hardship

In the 2008 Living Standards Survey [31], respondents provided information about themselves and others in their economic family unit (EFU). A respondent's EFU comprised the respondent and partner (if any), together with their dependent children in the household (if any). This was a narrower concept than the census family unit which includes other family members such as adult children and parents of adult children. In the survey, total response ethnicity was used, meaning that categories were not mutually exclusive, as one person could be in two or more categories depending on their response.

Deprivation Index based on data from the 2008 Living Standards Survey

In the 2008 Living Standards Survey report [31], a 14 item material deprivation index was used to compare the relative positions of different population groups. Each item in the index assessed an 'enforced lack', with items being divided into two categories: ownership/participation, where an item was wanted but not possessed because of cost; and economising items, which focused on cutting back or going without in order to pay for other basic needs. The deprivation score for each respondent was the sum of all enforced lacks, with a cut off of 4+ being used as a measure of material hardship, as it represented the 15% of the population experiencing the most hardship (and was thus seen as being equivalent to the MSD's income poverty measures).

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

Ownership/Participation

A good bed
Ability to keep main rooms adequately warm
Suitable clothes for important or special occasions

Home contents insurance
Presents for family and friends on special occasions

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

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

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

Proportion of children experiencing material hardship

Table 8 provides an overview of the distribution of children by their family's deprivation scores (DEP) according to items included in the Living Standards Survey. Additional child specific items not included in the calculation of the DEP score have been listed to highlight experiences of children living in households with differing experiences of material deprivation. It suggests that 22% of children lived in families experiencing four or more enforced lacks (10% had a DEP Score of 4–5 and 12% had a DEP score of 6+).

When broken down by individual item, those children experiencing material hardship (i.e. living in households with DEP scores of four or more) were exposed more to household economising behaviours such as having to wear worn out shoes or clothing, sharing a bed or bedroom, cutting back on fresh fruit and vegetables and postponing doctor's visits because of cost. For example, 39% of children whose families had a DEP score of 6+ continued to wear worn out shoes or clothing, while 58% had major difficulty keeping the house warm in winter (**Table 8**).

Proportion of children experiencing material hardship by ethnicity and family income

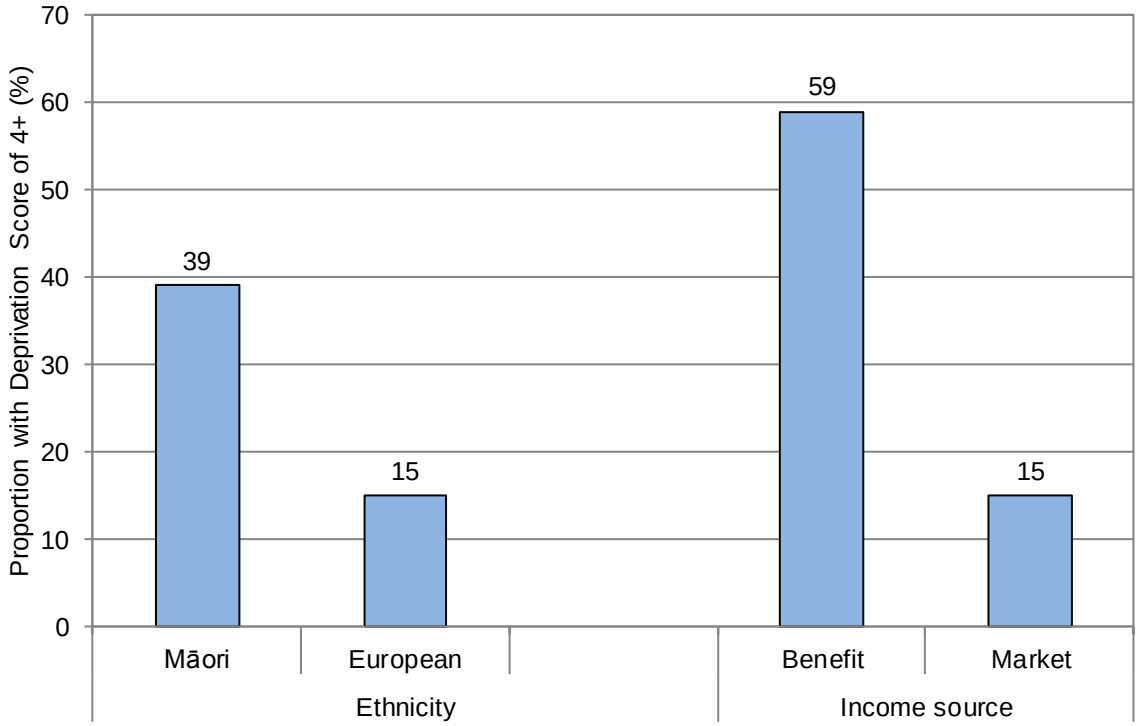
In the 2008 Living Standards Survey, 39% of Māori children, and 15% of European children aged 0–17 years were in families experiencing material hardship (i.e. scored four or more on a composite deprivation index measuring a range of "enforced lacks", as outlined in the Methods box above). In addition, 59% of children whose family's income source was a benefit experienced material hardship (**Figure 12**).

Table 8. Restrictions experienced by children by the deprivation score of their family (DEP score), from the New Zealand Living Standards Survey 2008

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

Source: NZ 2008 Living Standards Survey [31]; Note: Only those items mentioned in the Methods box are included in the calculation of DEP Scores. This table includes a number of additional child specific items (marked *) which were not included in the calculation of the DEP Index as they did not relate to all family types. These additional items have been included here in order to highlight the experiences of children living in households with differing experiences of material deprivation. [#] 'All' refers to all children aged 0–17 years.

Figure 12. 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 [31]; Notes: * Material Hardship defined as scoring four or more "enforced lacks" on the material deprivation index as outlined in the Methods box. Ethnicity is total response.

CHILD POVERTY: SEVERITY AND PERSISTENCE

Introduction

The following sections present two proxy indicators that capture aspects of the severity and duration of poverty for Māori children in in New Zealand.

Poverty Severity

- The proportion of children living in households below the 50% income poverty threshold, as measured using HES data [30].
- The proportion of children living in households who were both income poor and experiencing material deprivation, as measured using HES data [30].

Poverty Persistence

- The proportion of children exposed to chronic low income, as measured using data from Statistics New Zealand's Longitudinal Survey of Families, Income and Employment (SoFIE) up until 2009 [30,32].

There are limitations to the data, and the data on poverty persistence is somewhat out of date, but given their significant influence on long term outcomes for children, poverty severity and persistence need to be monitored. It is hoped that, in time, these proxy indicators will be replaced by more robust measures, which better capture the severity and persistence of poverty for New Zealand children.

Background

Research has indicated that, in general, children experiencing poverty early or for long periods of time have worse outcomes than those exposed to poverty only during adolescence, or for shorter periods of time [33,34]. Longer duration of income poverty is associated with greater material deprivation. [35].

A number of measures are available to assess the depth and severity of poverty but these are not updated regularly [30]:

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

The quality of HES data for households with very low incomes is a concern, according to Perry, and may have a detrimental impact on the robustness of measures of poverty depth [30].

The Statistics NZ's longitudinal Survey of Family, Income and Employment (SoFIE) that ran between 2002 and 2009 has provided a range of reasonably robust measures of poverty persistence [30] but no further updates are planned.

Poverty severity

Data source and methods

Indicator

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

Data source

New Zealand Household Economic Survey (NZHES n=2,800–3,500 households per survey) via Perry 2014 [30]. Note: Child Poverty measures are reported on by the Ministry of Social Development using NZHES data with

data being reported on 2-yearly from 1982–1998 and 3-yearly thereafter. Since 2007, income data have been reported annually using the new HES Incomes Survey. The full NZHES (including expenditure data), however, remains 3-yearly. For more detail on methodology see Perry 2014 [30].

Interpretation

The <50% relative poverty measure is based on a poverty benchmark (50% of the median income) that rises and falls with changes in national median incomes (i.e. poverty is defined in relation to the incomes of others in the same year).
For further detail see Perry 2014 [30].

Children in income-poor households experiencing material hardship

One approach to assessing the severity of child poverty in the absence of more robust measures, is to identify children living in households that are both income poor and experiencing material hardship. Perry notes that living above the poverty threshold reduces the risk of material hardship, but does not remove it. Those in hardship with incomes above the poverty line may have some expectation of living standards improving. For those in hardship and who also have low incomes, there is little chance of an improvement unless their income increases and stays up [30].

Figure 13 shows the proportion of those who are both income poor and materially disadvantaged for the population as a whole and for households with children [30].

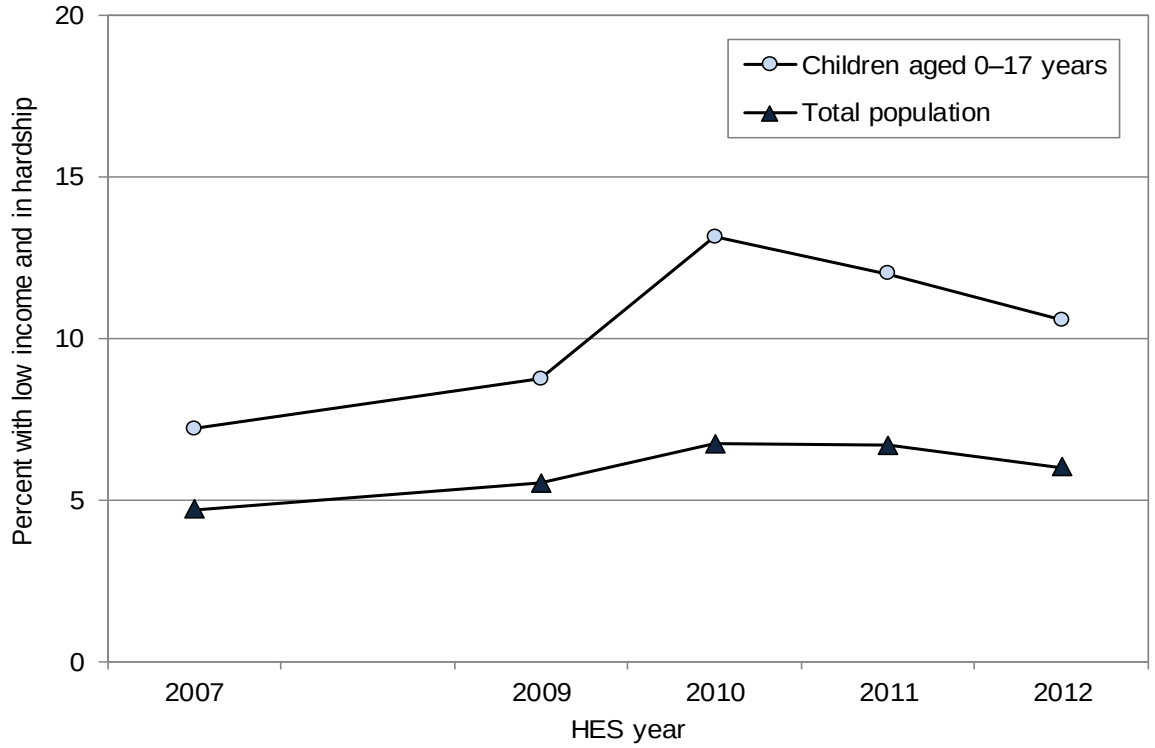
Children in households with incomes less than 50% of contemporary median

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

Figure 14 reviews the proportion of children aged 0–17 years living in households with incomes below 50% of the contemporary median, before (BHC) and after (AHC) adjusting for housing costs. Using the <50% poverty measure, during the 1980s the proportion of children living in poverty was similar before and after adjusting for housing costs. However, from 1992 onwards, child poverty rates were much higher after adjusting for housing costs, with the most rapid rises in child poverty between 1990 and 1994 being seen when the AHC measure was used. While child poverty rates in 2012 were similar to those in the early 1980s using the BHC measure, when the AHC measure was used, rates remained much higher than those in the 1980s.

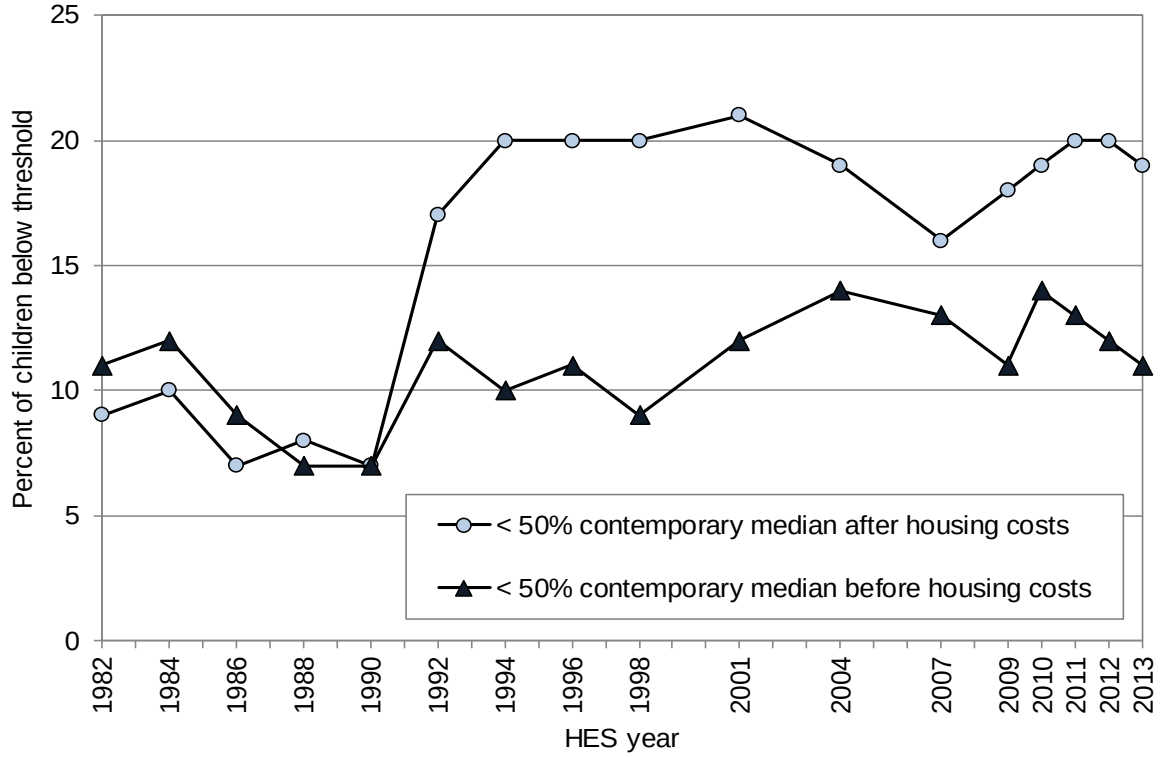
An increase in child poverty (<50% AHC measure) was also evident between 2007 and 2011. In 2012, 20% of children were living in severe poverty (**Figure 14**) with a slight drop to 19% in 2013.

Figure 13. Trends in the proportion of those who are both income poor and materially deprived, New Zealand 2007–2012 HES years



Source: Perry 2014 [30] derived from Statistics NZ Household Economic Survey (HES) 2007−2012

Figure 14. Proportion of dependent children aged 0–17 years living below the 50% of median income poverty threshold, New Zealand 1982–2013 HES years



Source: Perry 2014 [30] derived from Statistics NZ Household Economic Survey (HES) 1982−2013

Poverty persistence

The child poverty measures in the previous section were based on data from the Household Economic Survey (HES), this survey samples a different set of households in each survey, so it is not possible to explore poverty persistence at the household level using HES data. However, Statistics NZ's Survey of Family, Income and Employment (SoFIE) that began in October 2002, followed the same group of individuals and has longitudinal data available for seven years, from 2002–03 to 2008–09 [30].

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

Data source and methods

Definition

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

Data source

Statistics New Zealand's Survey of Family, Income and Employment (SoFIE)
The information in this section is drawn from Perry's 2014 Household Incomes Report [30], which is based on the analysis of SoFIE data published by Carter and Imlach Gunasekara (2012) [32] and some otherwise unpublished data provided to Perry by Carter and Imlach Gunasekara.

Interpretation

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

Persistent Poverty: In this analysis, participants' average income over the seven years was compared with an average low income (poverty) line over the same period. People whose average income across all seven years was below the average low income (poverty) line were said to be in persistent poverty. As income was averaged across all seven years, participants may have been above the income poverty line in some years, but still classified as being in persistent poverty [30].

Current Poverty: Participants were considered to be in current poverty if they fell below the income poverty line for which ever survey year was under review [30].

Note: In this analysis the poverty benchmarks used are based on 50% and 60% of gross income. This is different to the benchmarks used in the earlier income poverty section which are based on 60% of disposable income. Perry [30] notes that the two 60% benchmarks are not comparable (due to differences in the methodology used), and that that where comparisons are required, that the 50% gross is the most appropriate, as it is closer to the usual poverty figures reported (60% median disposable income).

Proportion in current and persistent income poverty

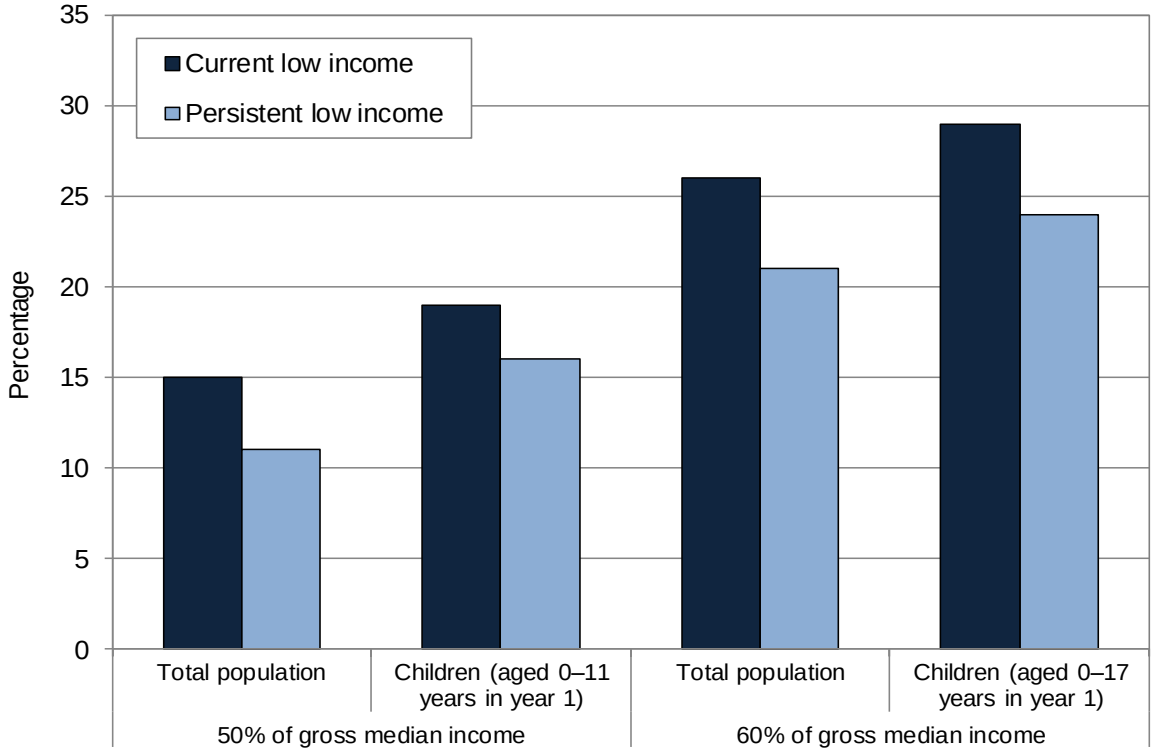
<60% Gross Median Threshold

Of the children who were aged 0–17 years in the first year of SoFIE (2002–03), 24% lived in households experiencing persistent poverty (i.e. an income which, when averaged across all seven years, was below 60% of the gross median) and 29% were deemed to be in current poverty (i.e. with an income below 60% of the gross in the year under review) (**Figure 15**). The reason for this difference is because in any given year, those in poverty comprise a mix of those who have transiently moved into poverty and moved out in later surveys, and those who were living in long term poverty.

<50% gross median threshold

When the threshold used is 50% of the gross median income, 16% of children who were aged 0–11 years in the first year (2002–03) were deemed to be in persistent poverty and 19% in current poverty (**Figure 15**). Perry [30] notes that in any one year, 60% of those in current poverty were also in persistent poverty (using the 50% gross median threshold). There was also a further group of children who, although not in poverty in the current year, were in persistent poverty when their households' incomes were averaged over the seven survey years.

Figure 15. Proportion of children with current and persistent low incomes, Statistics New Zealand's Survey of Family, Income and Employment (SoFIE) 2002–2009



Source: Perry 2013 [36] derived from Statistics NZ's Survey of Family, Income and Employment 2002–2009

OTHER MACROECONOMIC INDICATORS

GROSS DOMESTIC PRODUCT (GDP)

Introduction

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

Background

The Gross Domestic Product (GDP) is often used as a measure of the size of a nation's economy, with nominal GDP being expressed in current dollar prices, and real GDP being expressed in constant dollar prices (i.e. the dollar value of a particular year, after adjustment for inflation). Changes in real GDP are often used as a measure of economic growth, or the strength of the economy [37] with a recession typically being defined as two consecutive quarters of negative growth [38].

Data source and methods

Indicator

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

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

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

Data sources

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

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

GDP is the total market value of all final goods and services produced in a country in a given year equal to total consumer, investment and government spending, plus the value of exports, minus the value of imports. Three approaches can be used to calculate GDP. Short term-quarter on quarter monitoring traditionally uses the production approach which calculates what each separate producer adds to the value of final output by deducting intermediate consumption from gross output. Value-added is summed for all producers. Expenditure based approaches can also be used but they have historically shown more quarterly volatility and are more likely to be subject to timing and valuation problems [39]

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

Real GDP is adjusted for changing prices and reflects the extent to which growth in the value of goods and services is due to increased production rather than an increase in the absolute value of the goods and services produced [40]. Per capita real GDP divides the national GDP by the population.

Numerator:
Base series 1975–1987Q1 from [41] and supporting web page https://sites.google.com/site/eaqubs/ NZ Economy tables and graphs (27 July 2014). The authors sourced the GDP data from the following: 1975–1977: Hall and McDermott (2009) [42]; 1977–1987: Statistics NZ, SNBQ.S2SZT. Base series 1987Q2–current: Statistics NZ SND103AA. All these GDP data were re-expressed in March 2014 prices using a constant ratio based on the ratio of the nominal and real values in the March 2014 quarter.

Denominator:
Population series from [41] and supporting web page https://sites.google.com/site/eaqubs/ NZ Economy tables and graphs (27 July 2014). The authors sourced the population data from the following: 1934−1991: Statistics NZ, de facto population, DPEQ.SBEC; 1991–current: Statistics NZ, resident population DPEQ.SDAC.

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

ROT-AHE represent the number of hours usually worked and the usual income in a reference week. Average hourly earnings data are available split by ordinary time, overtime and total (ordinary time plus overtime). As with real GDP, real average hourly earnings are adjusted for changing prices. Average hourly earnings are calculated from the Quarterly Employment Survey (QES) which is a sample of approximately 18,000 business locations selected from a population of economically significant enterprises in surveyed industries, weighted to represent the number of employees in each industry sourced from the Business Register. Certain industries, including agriculture and aquaculture are not included in the QES [43,44].

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

1987–2014—Average hourly earnings QEX001AA
1980–1986—Average hourly rates, all sectors EMP013AA
1975–1979—Average hourly earnings index ERN001AA was used to calculate back from EMP013AA data.

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

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

Notes on Interpretation

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

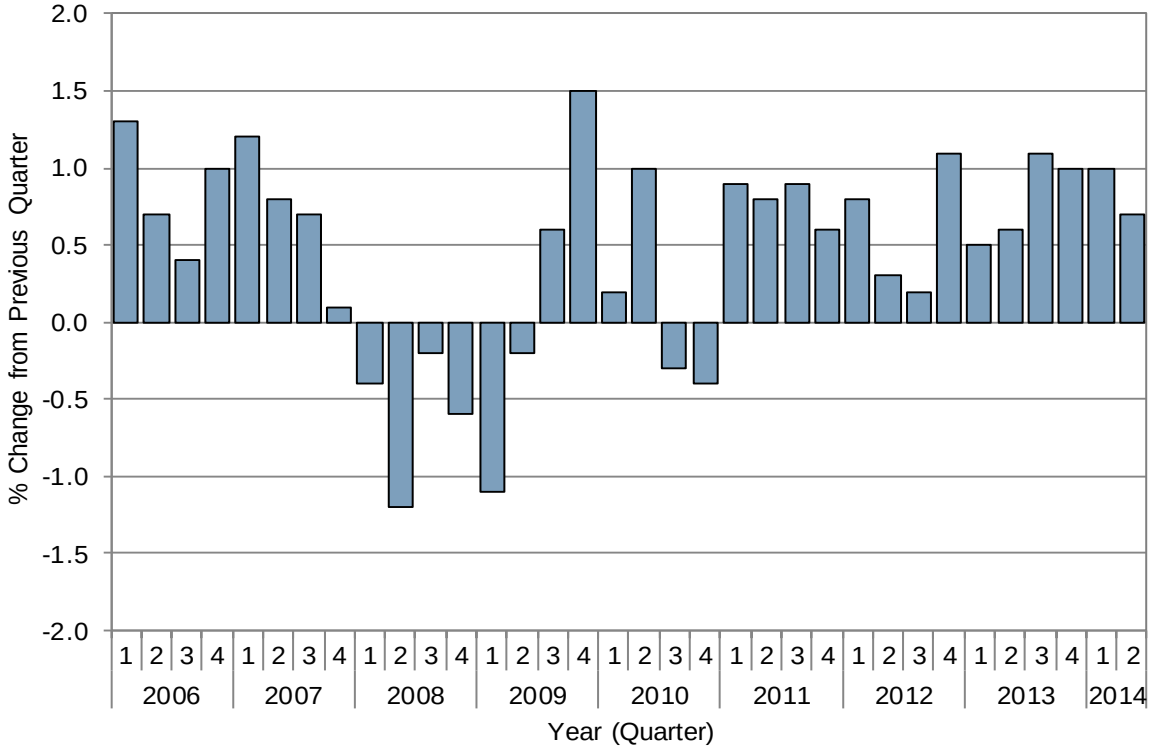
New Zealand trends

Quarterly changes in production-based measure of GDP

In New Zealand, GDP decreased for six consecutive quarters from March 2008 to June 2009, before increasing again, for four consecutive quarters, from September 2009 to June 2010. GDP then decreased for two quarters, before increasing again, for 14 consecutive quarters from March 2011 to June 2014. GDP grew by 0.7% in the June quarter of 2014 (**Figure 16**). Economic activity for the year ending June 2014 increased by 3.5%, when compared to the year ending June 2013 [45].

During the June 2014 quarter, business services (up 4.2%) was the main driver of growth. Agriculture, forestry and fishing (down 2.8%) partly offset the growth [45].

Figure 16. Gross Domestic Product (GDP): percentage change from previous quarter, New Zealand March quarter 2006 to June quarter 2014

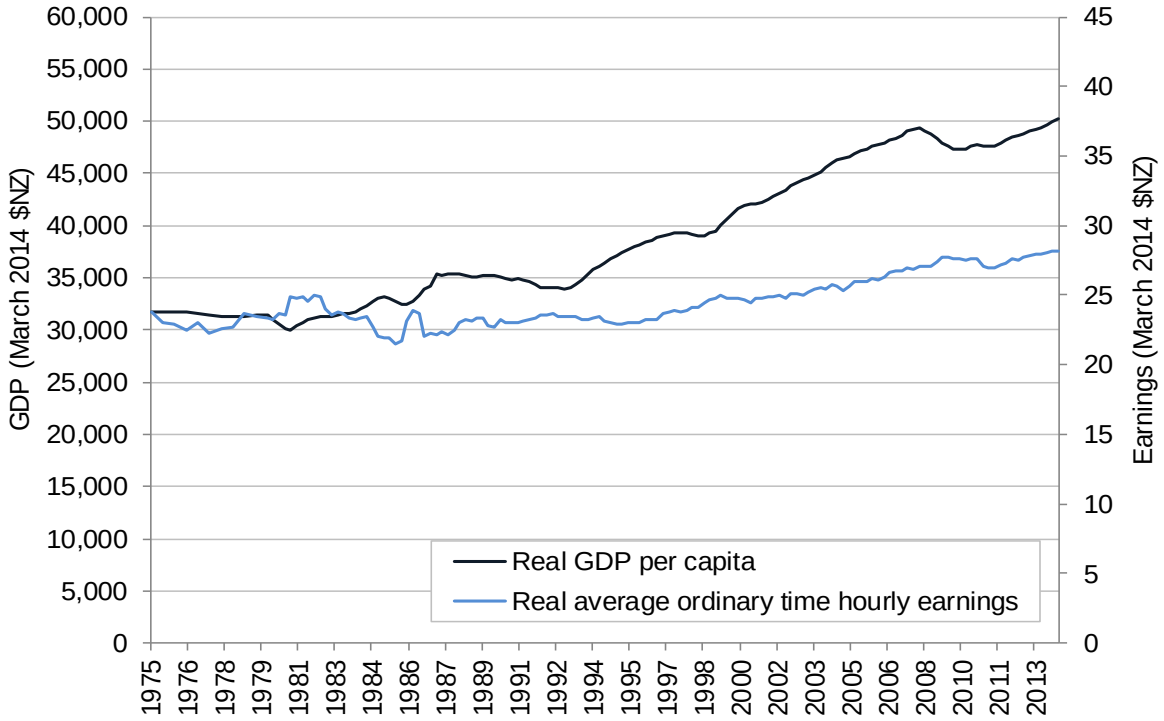


Source: Statistics New Zealand; Note: Seasonally adjusted chain volume series expressed in 1995/96 prices

Trends in real GDP and average hourly earnings

In New Zealand real GDP per capita increased 60% from $31,426 in the March quarter of 1975, to $50,261 in the March quarter of 2014, while real average ordinary time hourly earnings only increased 18% from $23.81 to $28.18 during the same period (**Figure 17**).

Figure 17. Real Gross Domestic Product (GDP) per capita and real average ordinary time hourly earnings, New Zealand March quarter 1975 to March quarter 2014



Source: Lattimore and Eaqub 2011 [41] and Statistics New Zealand; Note: Figures are expressed in March 2014 $NZ

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. Neither of these measures is available by ethnicity therefore the data presented relates to the New Zealand population as a whole.

Background

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

Research has shown that people with higher socioeconomic status have more chance of experiencing better health, both in New Zealand society as a whole and within the Māori population [46]. The World Health Organization's Commission on Social Determinants of Health noted that "the structural determinants and conditions of daily life constitute the social determinants of health and are responsible for a major part of health inequities between and within countries" [2]. There has been much debate regarding the influence of income inequality on population health and the degree to which the size of the gap between the richest and the poorest sections of society has an influence on population health irrespective of the proportion of the population who are considered to be poor, or the average per capita income [47], but there is research indicating that social gradients in health outcomes are evident even among people who are not poor, for example British civil servants [48].

Data source and methods

Indicator

1. *Income Inequality as measured by the P80/P20 Ratio*

2. *Income Inequality as measured by the Gini coefficient*

Data source

Statistics New Zealand Household Economic Surveys (NZHES n=2,800–3,500 households per survey) via Perry 2014 [30]

Note 1: The P80/P20 Ratio and Gini coefficient are monitored by the Ministry of Social Development using NZHES data which was available 2-yearly from 1982 to 1998, and 3-yearly thereafter. Since 2007, income data has become available annually through the new NZHES Incomes Survey. The full NZHES (including expenditure data) however remains 3-yearly. For more detail on the methodology used see Perry 2014[30].

Notes on interpretation

P80/P20 Ratio: The P80/P20 ratio is often used as a measure of income inequality. It is calculated by ranking individuals by equivalised household income and dividing into 100 equal groups. Each group is called a percentile. If ranking starts with the lowest income, the income at the top of the 20th percentile is denoted P20 and the income at the top of the 80th percentile is called P80. The relationship between income value at the 80th percentile and the income value of the 20th percentile is called the P80/20 ratio. In general, the higher the ratio, the greater is the level of inequality [30] so a P80/20 ratio of 3.0 indicates that those at the top of the 80th percentile have incomes three times higher than those at the top of the 20th percentile.

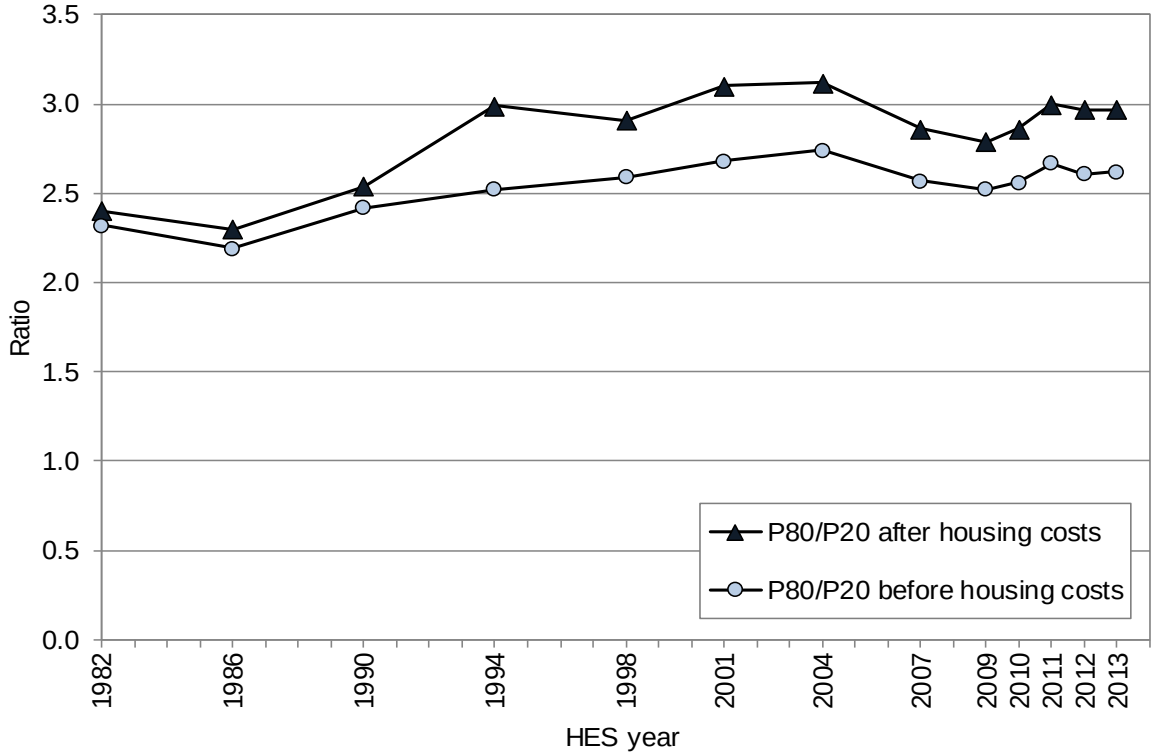
Gini coefficient: The Gini coefficient is another common measure of inequality used internationally. It gives a summary of income differences between individuals in the population. When the Gini coefficient = 0, all people have the same level of income. When it approaches 1, one person receives all the income. It is an overall measure of income inequality as the higher the value, the greater the level of inequality. The Gini coefficient is often reported as a percentage so scores range between 0 and 100. [49]. 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 [30]. For more detail on calculating the Gini coefficient see The World Bank [50].

New Zealand Trends

Income Inequality: P80/P20 ratio

In New Zealand during 1982–2013 income inequality, as measured by the P80/P20 ratio, was higher after adjusting for housing costs than before housing costs. Housing costs generally make up a greater proportion of household income for households on lower incomes than those on higher incomes. The most rapid rises in income inequality occurred during 1988–1992. While income inequality also rose during 1994–2004, the overall rate of increase was slower. During 2004–2007, income inequality fell, a decline that Perry attributes to the Working for Families package. The impact of the economic downturn and global financial crisis during 2009–2011 led to an increase in inequality, although Perry notes that it may take one or two further surveys before the post-crisis inequality level becomes clear [30] (**Figure 18**).

Figure 18. Income inequality in New Zealand as assessed by the P80/P20 ratio for the 1982–2012 HES years

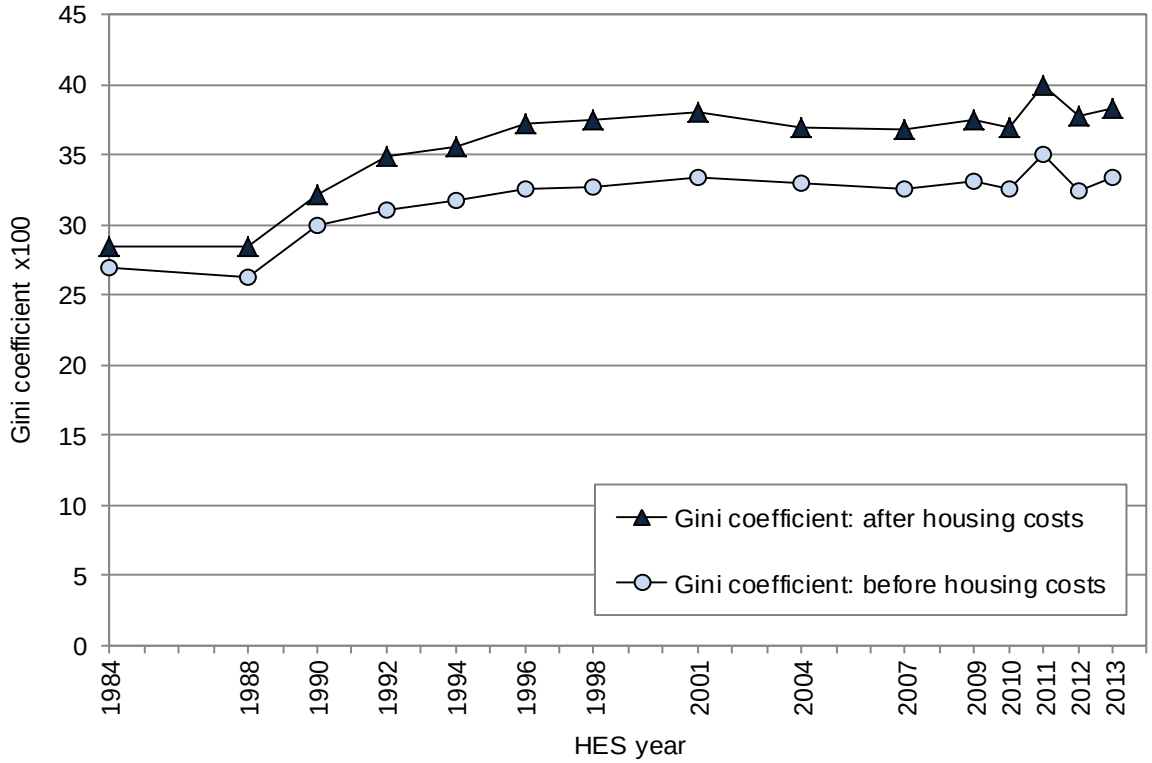


Source: Perry 2014 [30], derived from Statistics NZ Household Economic Survey (HES) 1982−2013

Income inequality: Gini coefficient

In New Zealand during 1984–2013 income inequality, as measured by the Gini coefficient, was higher after adjusting for housing costs, for the same reasons as given above. The most rapid rises in income inequality also occurred between the late 1980s and early 1990s. Using both the before and after housing cost measures, the Gini coefficient declined slightly between 2001 and 2007, a decline which Perry attributes to improving employment and the impact of the Working for Families package. During 2009–2013, however, there was considerable volatility in the Gini coefficient, which Perry attributes to the differing size and timing of the impacts 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 [30] (**Figure 19**).

Figure 19. Income inequality in New Zealand as assessed by the Gini coefficient for the 1982–2012 HES years



Source: Perry 2014 [30] derived from Statistics NZ Household Economic Survey (HES) 1984−2013

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

Over the last year or two, the unemployment rate has been falling from its high of 7.4% in the second and third quarters of 2012. The seasonally adjusted employment rate for the June 2014 quarter was 5.6%, the lowest it has been since the March 2009 quarter [51]. Unemployment rates are higher for young people and for Māori (compared to European people). Some, but not all, of the higher unemployment rates for Māori can be explained by the younger age structure of the Māori population as unemployment rates for Māori are higher at all ages. After age standardisation (which takes account of the differences in the age structures of the different ethnic populations) Māori still have significantly higher unemployment rates than Europeans and these ethnic differences appear to have increased since the recession of 2008−2009 [52].

Parental unemployment can have significant effects on children's wellbeing. It reduces the family's financial resources and may lead to poverty especially if the unemployed parent is the sole breadwinner [53]. The effects of parental unemployment vary depending on the age of the child, whether one or both parents are unemployed and for how long, and whether the negative effects of reduced family income outweigh the positive effects of more time spent with the child.

Data source and methods

Indicator

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

Data Source

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

Notes on interpretation

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

(a) had actively sought work in the past four weeks ending with the reference week, or
(b) had a new job to start within four weeks [54].

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

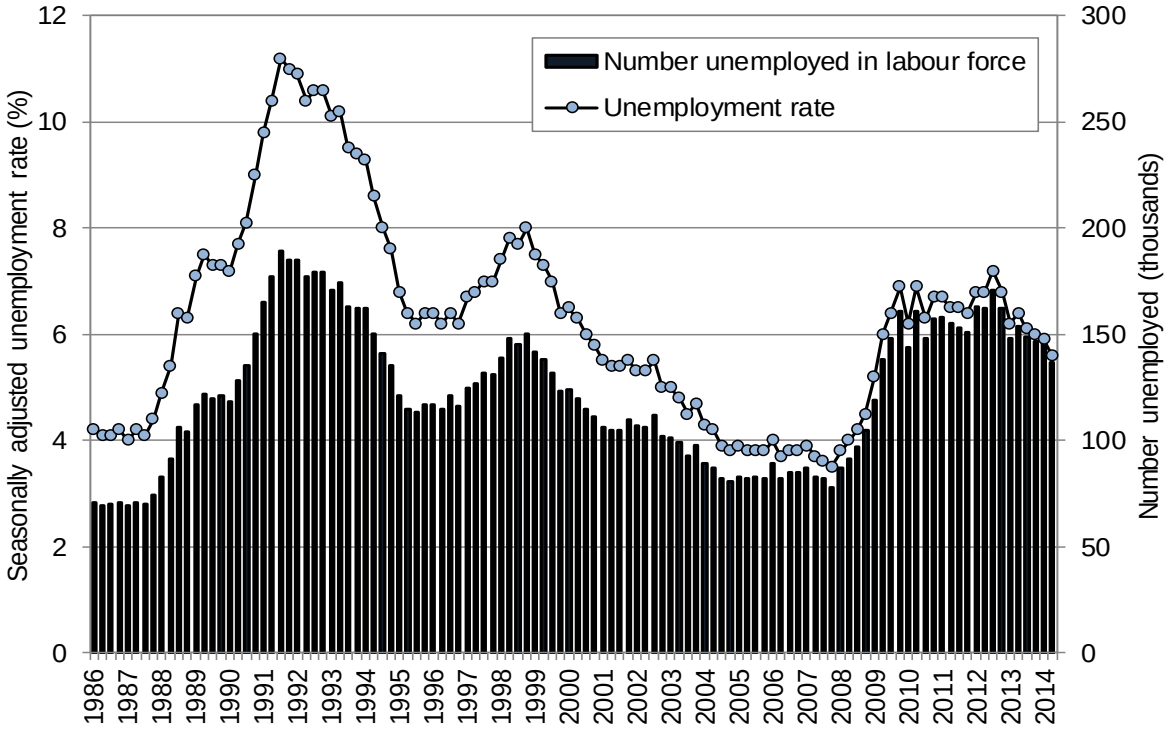
Note 3: Seasonal adjustment makes data for adjacent quarters more comparable by smoothing out the effects of any regular seasonal events. This ensures the underlying movements in time series are more visible. Each quarter the seasonal adjustment process is applied to the latest and all previous quarters. This means that seasonally adjusted estimates for previously published quarters may change slightly [55].

New Zealand Distribution and trends

Seasonally adjusted unemployment rates

In the quarter ending June 2014, the seasonally adjusted unemployment rate fell to 5.6%, while seasonally adjusted unemployment numbers decreased from 146,000 in the March quarter of 2014, to 137,000 in the June quarter (**Figure 20**). The number of people employed increased by 10,000 to reach 2,328,000 [56].

Figure 20. Seasonally adjusted quarterly unemployment rates, New Zealand March 1986 to June 2014



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

Unemployment rates by age

In New Zealand during June 1987–2014, unemployment rates were consistently higher for younger people aged 15–19 years than other age groups. Rates were lower for each age group, with those aged 45–49 years having the lowest). In the year ending June 2014, annual unemployment rates were 22.5% for those aged 15–19 years and to 11.7% for those aged 20–24 years (**Figure 21**).

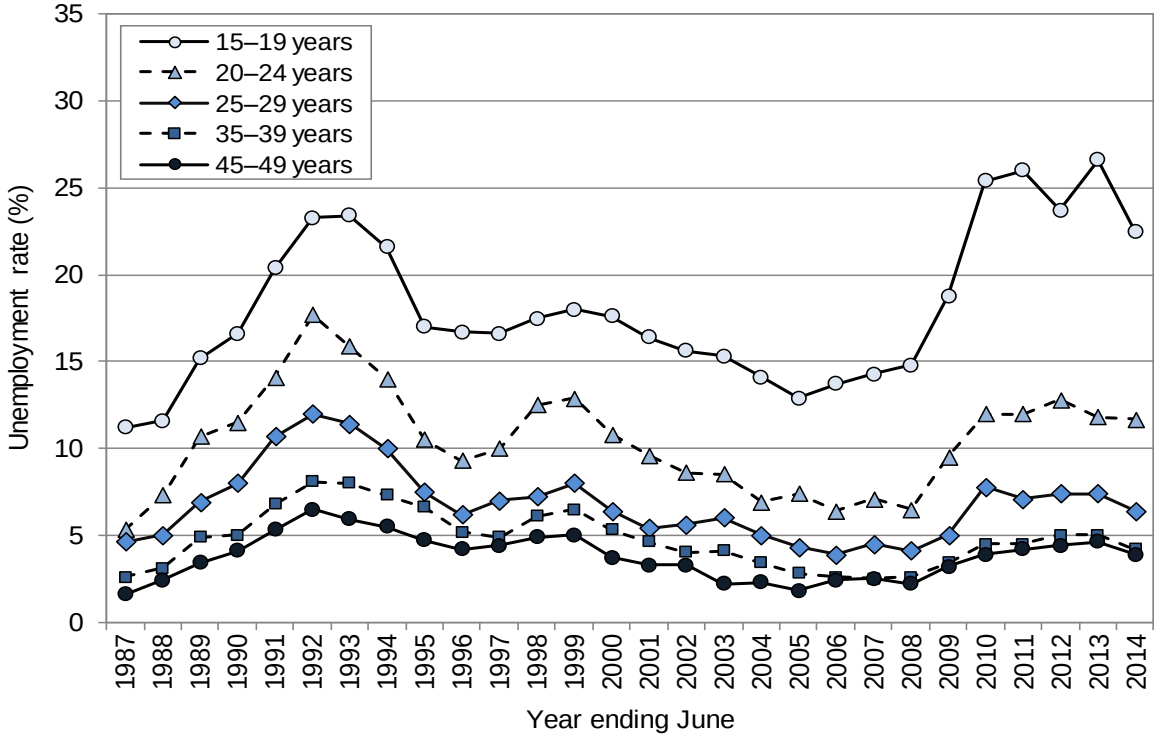
Unemployment rates by age and gender

In New Zealand during June 1987–2014, there were no consistent gender differences in unemployment rates for young people aged 15–24 years. During the year ending June 2014, unemployment rates for those aged 15–19 years were 22.2% for females and 22.8% for males, while for those aged 20–24 years, rates were 12.3% for females and 11.2% for males (**Figure 22**).

Unemployment rates by ethnicity

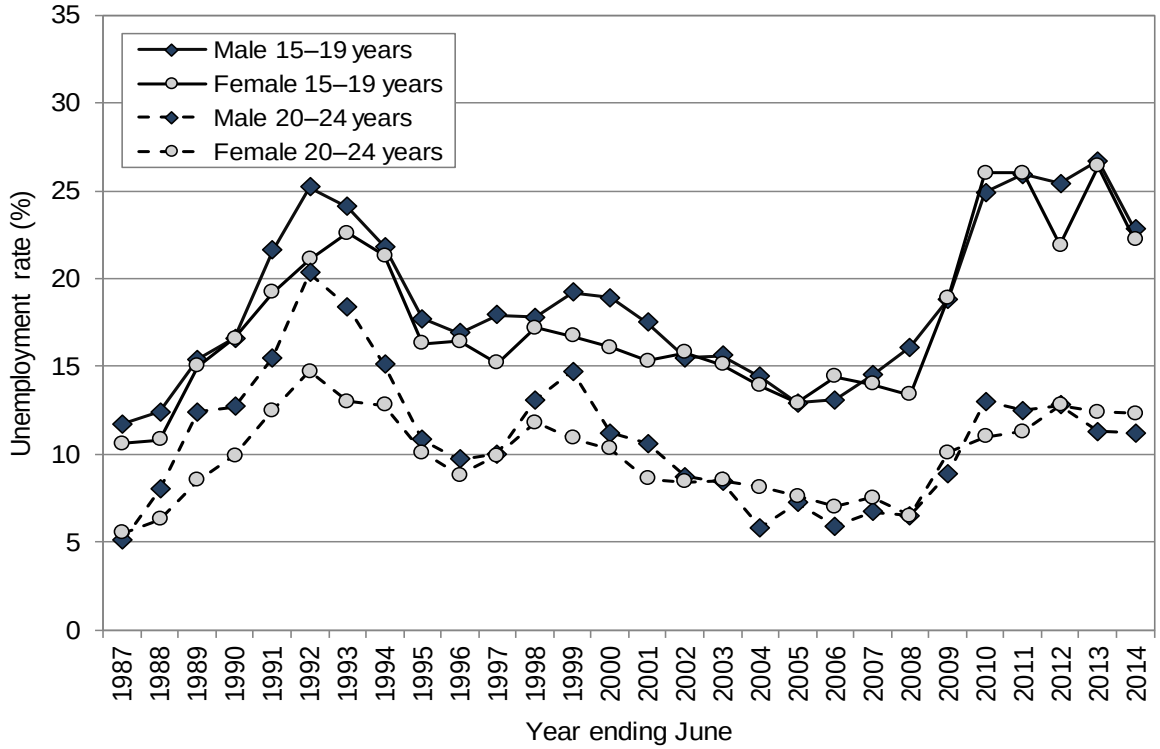
In New Zealand during the period March 2008 to June 2014 unemployment rates were consistently higher for Māori than European people. Unemployment rates increased for both ethnic groups during 2008 and 2009, but were more variable between 2010 and 2014. In the quarter ended June 2014, unemployment rates were 11.0% for Māori and 4.1% for European people (**Figure 23**).

Figure 21. Unemployment rates by age (selected age groups), New Zealand years ending June 1987–2014



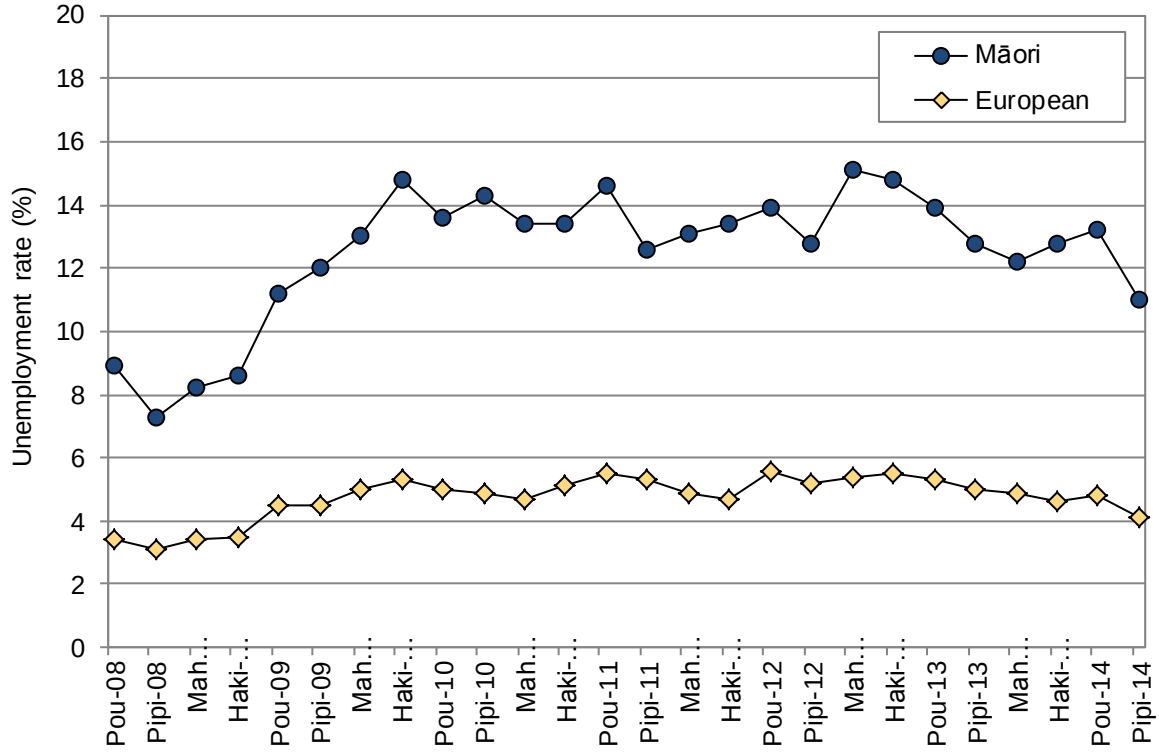
Source: Statistics New Zealand Household Labour Force Survey

Figure 22. Unemployment rates by age and gender in young people aged 15–24 years, New Zealand years ending June 1987–2014



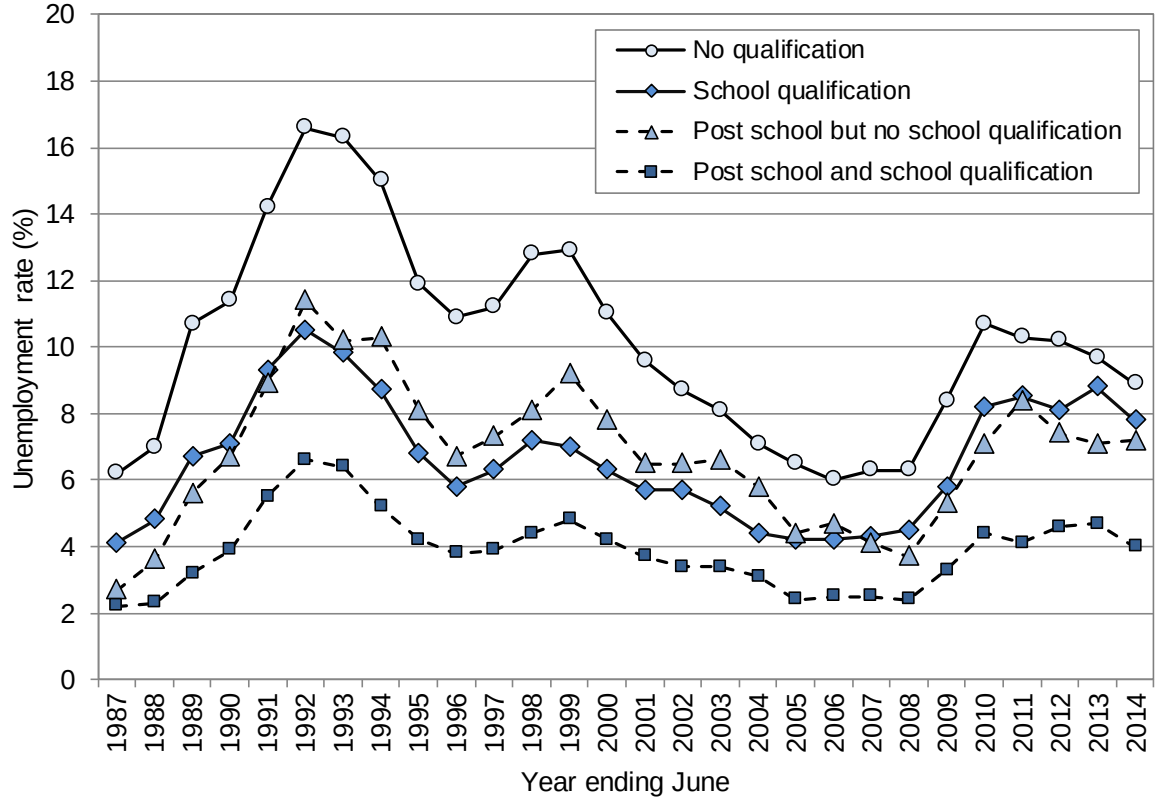
Source: Statistics New Zealand Household Labour Force Survey

Figure 23. Quarterly unemployment rates by ethnicity, New Zealand March 2008 to June 2014



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

Figure 24. Unemployment rates by qualification, New Zealand years ending June 1987−2014



Source: Statistics New Zealand Household Labour Force Survey

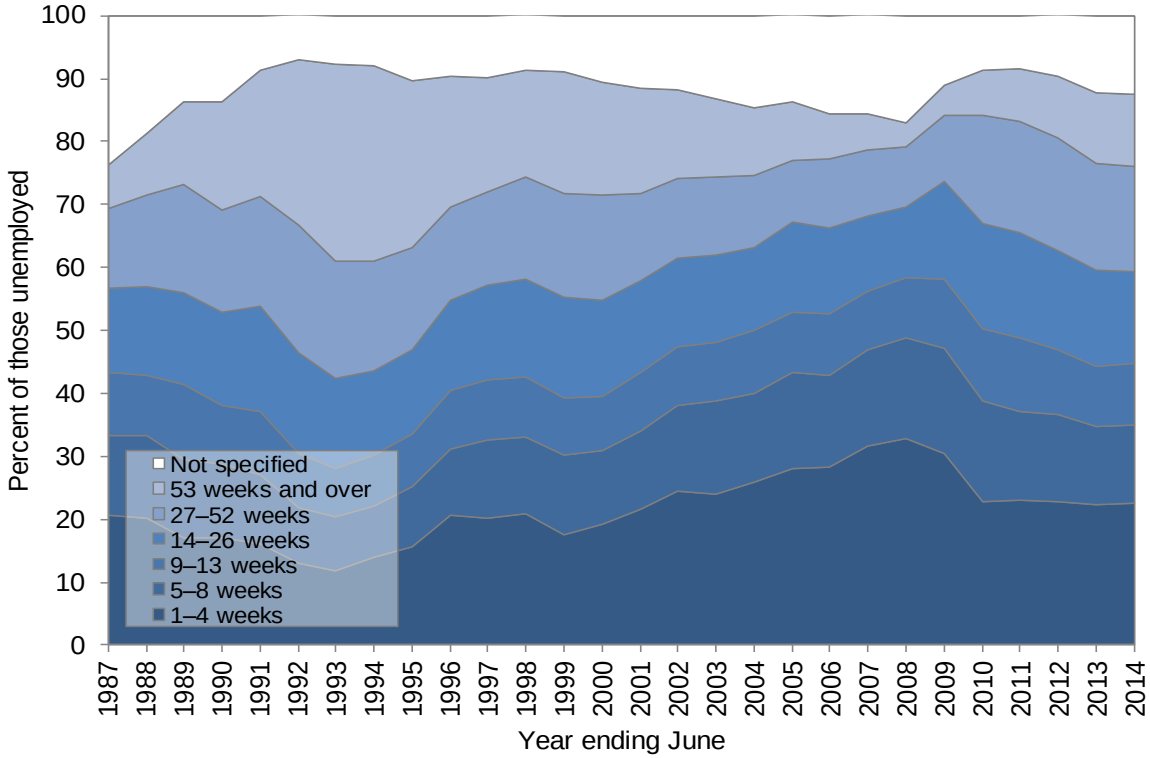
Unemployment rates by qualification

In New Zealand during the years ended June 1987–2014, unemployment rates were highest for those with no qualifications, followed by those with school qualifications, or post school but no school qualifications. Rates were lowest for those with both post school and school qualifications. In the year ended June 2014, unemployment rates were 8.9% for those with no qualifications, 7.8% for those with school qualifications, 7.2% for those with post school but no school qualifications and 4.0% for those with post school and school qualifications (**Figure 24**).

Duration of unemployment

In New Zealand during the years ended June 1987–2014, duration of unemployment varied markedly, and in a manner consistent with prevailing unemployment rates. Thus the highest proportion of people unemployed for 53+ weeks occurred during the early to mid-1990s, when unemployment rates were at their peak, while the highest proportion unemployed for only 1–4 weeks occurred in the mid to late 2000s, when unemployment rates were at their lowest (**Figure 25**).

Figure 25. Proportion of those unemployed by duration of unemployment, New Zealand years ending June 1987–2014

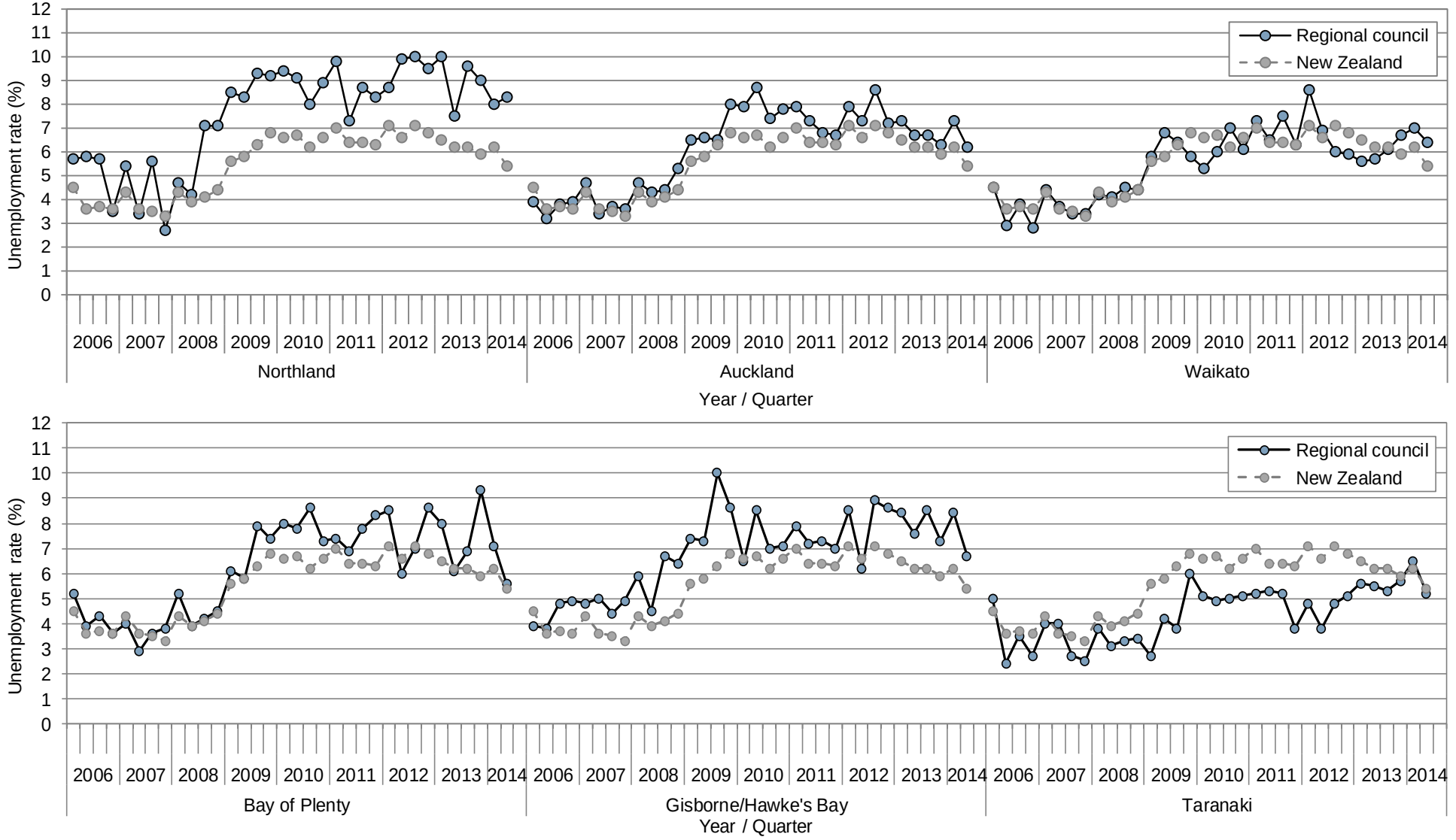


Source: Statistics New Zealand Household Labour Force Survey

Quarterly regional unemployment rates

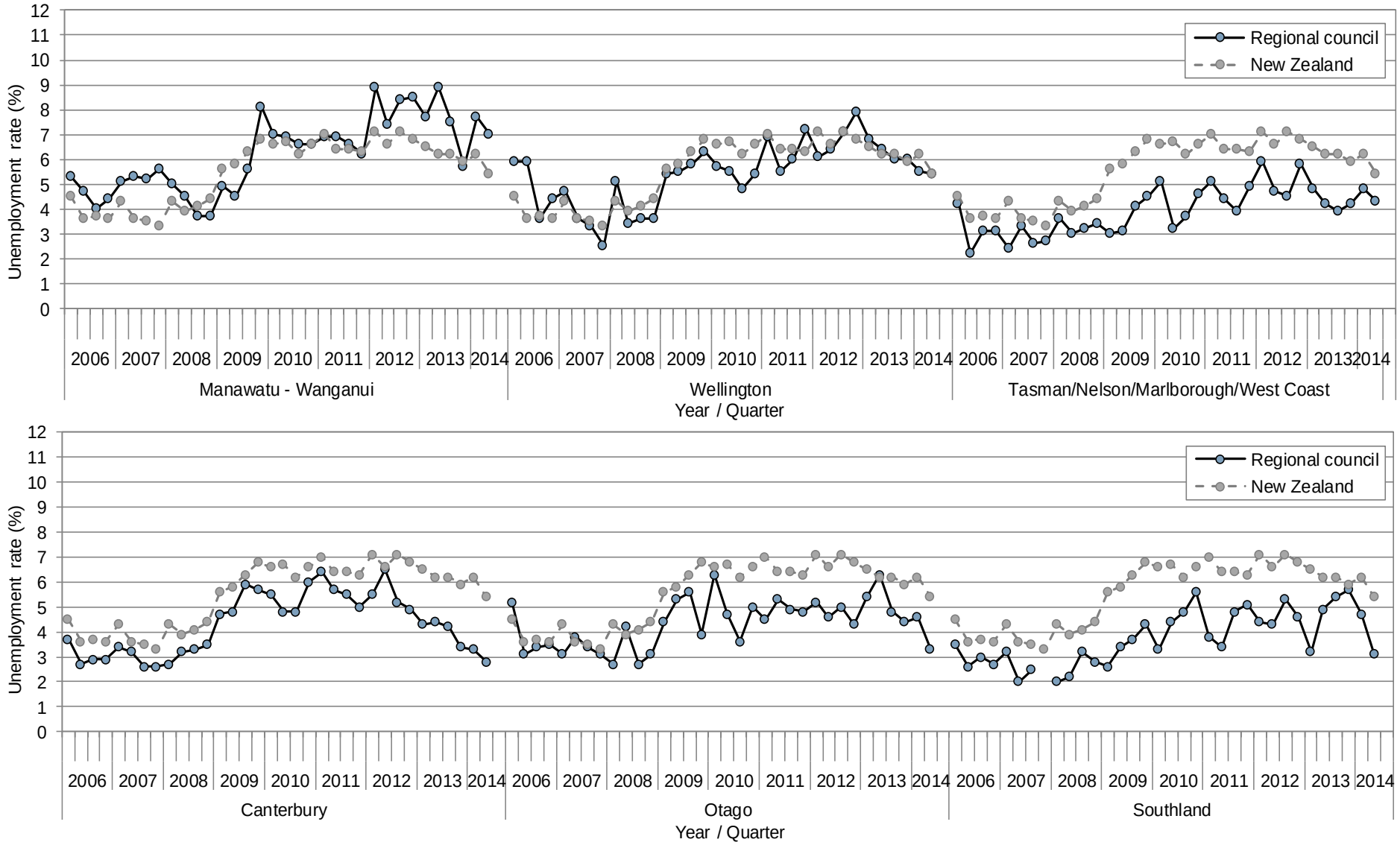
In New Zealand during March 2006 to June 2014, unemployment rates varied by regional council. While the trends for individual regions varied, in general unemployment rates in Northland, Auckland, the Bay of Plenty and Gisborne/Hawke's Bay were higher than the New Zealand rate, while rates in Taranaki and the South Island regional councils were lower (**Figure 26, Figure 27**).

Figure 26. Quarterly unemployment rates by regional council, upper and mid North Island regional councils vs. New Zealand March 2006 to June 2014



Source: Statistics New Zealand Household Labour Force Survey

Figure 27. Quarterly unemployment rates by regional council, lower North Island and South Island regional councils vs. New Zealand March 2006 to June 2014



Source: Statistics New Zealand Household Labour Force Survey

CHILDREN RELIANT ON BENEFIT RECIPIENTS

Introduction

The following section reviews the number of children aged 0–17 years who were reliant on a benefit recipient during June, 2000–2014, using information from the Ministry of Social Development's SWIFTT database. As the SWIFTT database does not collect information on the ethnicity of children reliant on benefit recipients (but only information on the ethnicity of the benefit recipients themselves), no breakdown by ethnicity is available for this indicator.

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

Background

In New Zealand, children who are reliant on benefit recipients are a particularly vulnerable group. The Living Standards Survey conducted five years ago found that about three out of five children living in households whose main source of income was a benefit experienced material hardship [31]. Benefit-reliant families were much more likely to report living in houses that were damp or mouldy, or in very poor physical condition; that their children were having to continue to wear worn out shoes or clothing; and that they were postponing doctors' visits because of cost. All these are factors that are likely to impact adversely on children's health and wellbeing.

While the number of children reliant on a benefit recipient is not exactly the same as the number living in significant hardship, nevertheless it is an indicator of the size of a vulnerable group who tend to have higher than average health needs, and so make significant demands on health services.

Data source and methods

Indicator

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

Data Source

Numerator: SWIFTT Database: Number of children aged 0–17 years who were reliant on a benefit recipient
Denominator: Statistics NZ Estimated Resident Population as at 30 June each year

Notes on interpretation

Note 1: All data in this section were provided by the Ministry of Social Development (MSD) and were derived from the SWIFTT database. SWIFTT was developed by the NZ Income Support Service to calculate, provide and record income support payments and related client histories [57]. It provides information on the recipients of financial assistance through Work and Income.

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

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

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

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

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

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

Note 5: Service centres included for each DHB: Northland: Dargaville, Kaikohe, Kaitaia, Kamo, Kawakawa, Kerikeri, Onerahi, Whangarei Central; Waitemata: Albany, Birkenhead District, Browns Bay, Glenfield, Glenmall, Helensville, New Lynn, Orewa, Takapuna, Waitakere, Warkworth, Westgate; Auckland: Avondale,

Grey Lynn, Mt Albert, Mt Eden, Onehunga, Otahuhu, Queen Street, Tamaki, Three Kings, Waiheke Panmure, Ponsonby/Grey Lynn, Pt. Chevalier, Queen Street (incl Super), Tamaki, Three Kings, Waiheke, AK Childcare Processing Centre; Counties Manukau: Clendon, Highland Park, Hunters Corner District, Mangere, Manukau District, Manurewa, Otara, Papakura, Papatoetoe, Pukekohe, Waiuku; Waikato: Cambridge, Dinsdale, Five Cross Roads, Glenview, Hamilton, Hamilton East, Huntly, Matamata, Morrinsville, Ngaruawhaia, Paeroa,

Te Awamutu, Thames, Waihi, Taumarunui, Te Kuiti, Tokoroa; Bay of Plenty: Greerton, Kawerau, Mount Maunganui, Opotiki, Tauranga, Te Puke, Whakatane; Lakes: Rotorua, Taupo; Tairawhiti: Gisborne, Kaiti, Ruatoria; Taranaki: Hawera, New Plymouth, Stratford, Waitara; Hawke's Bay: Flaxmere, Hastings Community Link, Napier, Taradale, Waipukurau, Wairoa; MidCentral: Dannevirke, Feilding, Foxton, Horowhenua, Otaki, Palmerston North; Whanganui: Marton, Taihape, Whanganui; Hutt Valley: Lower Hutt, Naenae, Upper Hutt, Wainuiomata; Capital & Coast: Kapiti, Johnsonville, Kilbirnie, Newtown, Porirua, Wellington; Wairarapa: Wairarapa; Nelson Marlborough: Blenheim, Motueka, Nelson, Nelson Region Processing Unit, Richmond; South Canterbury: Timaru; Canterbury: Actionworks, Ashburton, Hornby, Kaiapoi, Linwood, New Brighton, Papanui, Rangiora, Riccarton, Shirley, Sydenham; West Coast: Greymouth, Westport; Southern: Alexandra, Balclutha, Dunedin Central, Mosgiel, Oamaru, South Dunedin, Gore, Invercargill, Queenstown

New Zealand distribution and trends

Number of children reliant on a benefit recipient

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

Much of this variation can be attributed to changes in the number of children reliant on unemployment benefit recipients. The number of children dependent on a recipient of an unemployment benefit fell from 51,124 in June 2000 to 5,243 in June 2008. The numbers then increased to reach 17,281 in June 2010 before falling again. By June 2013, 12,622 children were reliant on an unemployment benefit recipient (**Table 9**).

Following the welfare reform of July 2013, the number of children aged 0–17 years who were reliant on a benefit recipient as at June 2014 was 196,247. Of these children, the majority were reliant on a recipient of Sole Parent Support (141,468; 72.1%). The next largest group were those reliant on a recipient of Jobseeker support (18,502; 17.0%) (**Table 9**).

Proportion of children reliant on a benefit recipient

The proportion of all children aged 0–17 years in New Zealand who were reliant on a benefit recipient fell from 26.2% in June 2000 to 18.5% in June 2008. It then increased, to reach a peak of 21.4% in June 2010, before falling to 19.6% in June 2013 (**Figure 28**).

A large part of the initial decline was due to a fall in the proportion of children reliant on unemployment benefit recipients. This fell from 4.9% of children in June 2000, to 0.5% in June 2008. It then increased to 1.6% in June 2010 before falling again to 1.2% in June 2013. The proportion of children reliant on DPB recipients also fell from 17.9% in June 2000 to 14.5% in June 2008, before increasing to 16.5% in June 2011. It then fell again to 15.1% in June 2013 (**Figure 28**).

During this period, the rate of decline in the number of children reliant on DPB recipients was much less than the rate of decline in the number reliant on unemployment benefit recipients (**Figure 28**). As a consequence, the proportion of benefit-dependent children who were reliant on DPB recipients actually increased, from 68.4% of benefit-dependent children in June 2000, to 76.9% in June 2013 (**Table 9**).

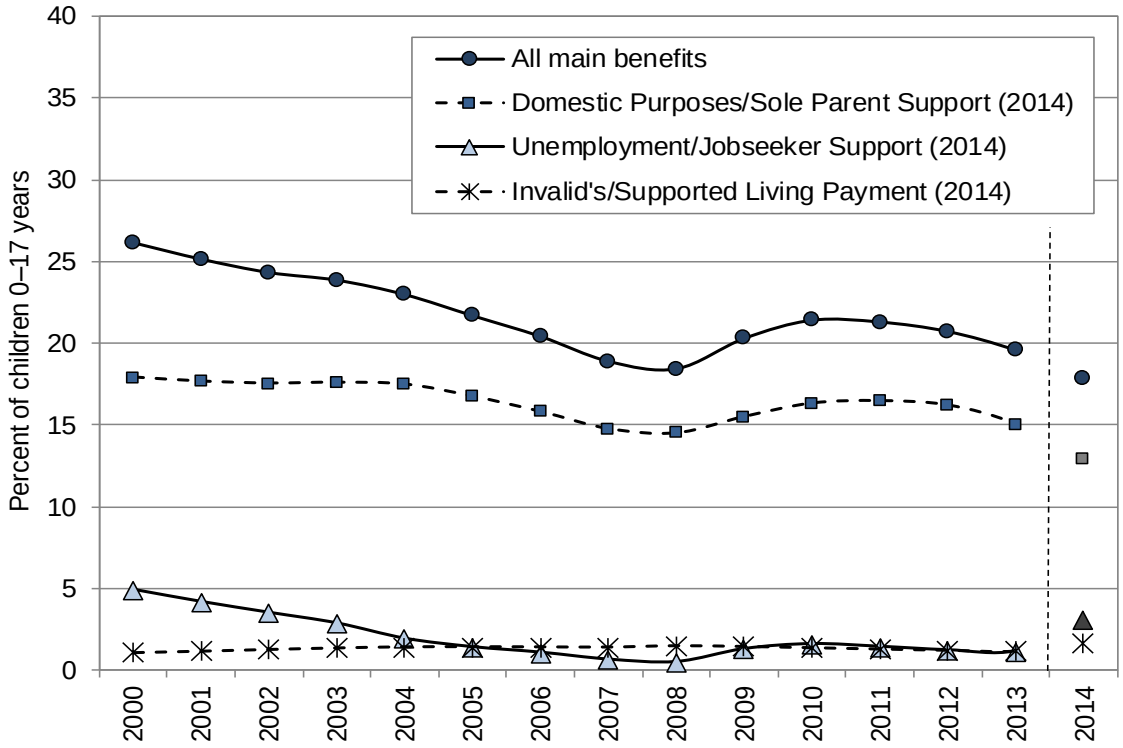
In June 2014, after the welfare reform was introduced, the proportion of all children aged 0–17 years in New Zealand who were reliant on a benefit recipient was 17.9%. The proportion of all children who were reliant on recipients of the various benefits types was: Sole Parent Support 12.9%, Jobseeker Support 3.0%, and Supported Living Payment 1.7% (**Figure 28**).

Table 9. Number of children aged 0–17 years who were reliant on a benefit recipient by benefit type, New Zealand, as at end of June 2000–2014

Year	Domestic Purposes		Unemployment		Invalid's		Sickness		Other benefits		Total
	Number	Percent*	Number	Percent *	Number	Percent *	Number	Percent *	Number	Percent *	Number
2000	185,658	68.4	51,124	18.8	11,205	4.1	11,425	4.2	12,051	4.4	271,463
2001	184,448	70.2	43,688	16.6	12,164	4.6	11,155	4.2	11,468	4.4	262,923
2002	184,497	72.0	36,960	14.4	13,290	5.2	11,836	4.6	9,611	3.8	256,194
2003	186,288	73.6	30,257	12.0	14,306	5.7	12,477	4.9	9,701	3.8	253,029
2004	186,372	76.0	20,413	8.3	15,091	6.2	13,782	5.6	9,711	4.0	245,369
2005	179,791	77.1	14,968	6.4	15,277	6.6	13,892	6.0	9,267	4.0	233,195
2006	171,011	77.3	11,422	5.2	15,291	6.9	13,775	6.2	9,598	4.3	221,097
2007	160,137	78.1	6,800	3.3	15,197	7.4	13,509	6.6	9,394	4.6	205,037
2008	157,693	78.6	5,243	2.6	16,045	8.0	11,980	6.0	9,564	4.8	200,525
2009	168,709	76.3	13,943	6.3	15,605	7.1	13,025	5.9	9,855	4.5	221,137
2010	177,874	76.1	17,281	7.4	14,840	6.4	13,798	5.9	9,840	4.2	233,633
2011	179,784	77.2	15,486	6.7	14,044	6.0	13,351	5.7	10,144	4.4	232,809
2012	177,237	78.1	13,205	5.8	13,287	5.9	12,955	5.7	10,212	4.5	226,896
2013	165,113	76.9	12,622	5.9	12,804	6.0	12,590	5.9	11,617	5.4	214,746
	Sole Parent Support (incl EMA[t])		Jobseeker Support		Supported Living Payment				Other benefits		Total
	Number	Percent *	Number	Percent *	Number	Percent *			Number	Percent *	Number
2014	141,468	72.1	33,447	17.0	18,502	9.4			2,830	1.4	196,247

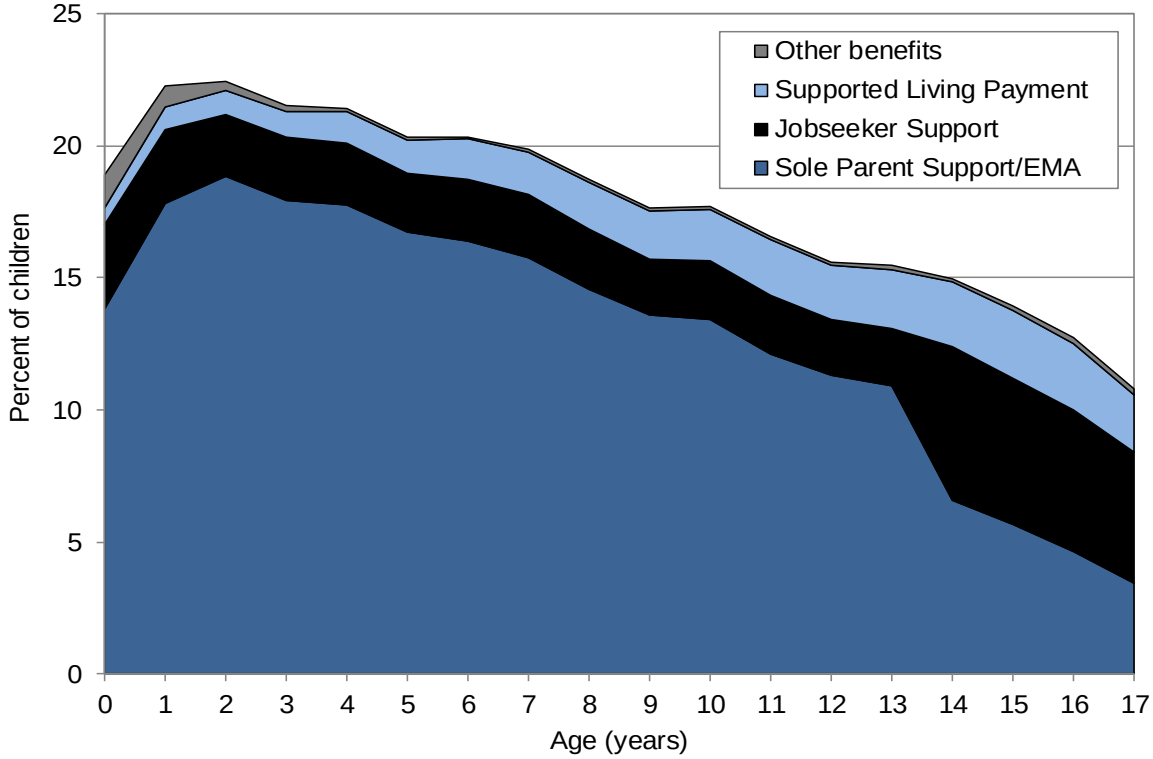
Source: MSD SWIFTT Database; Note: * Percent refers to percent of children relying on benefit recipients, rather than percent of all children; [t] EMA: Emergency Maintenance Allowance; for composition of “Other benefits” see Methods box above

Figure 28. Proportion of all children aged 0–17 years who were reliant on a benefit recipient by benefit type, New Zealand as at end of June 2000–2014



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

Figure 29. Proportion of all children aged 0–17 years who were reliant on a benefit recipient by age and benefit type, New Zealand as at end of June 2014



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

Distribution by age

At the end of June 2014, the proportion of children reliant on a benefit recipient was highest among those aged 1–4 years. The proportion reduced gradually with increasing age through middle to late childhood, and then more steeply as children reached 13 years of age (**Figure 29**).

Distribution by DHB

At the end of June 2014 the number of children aged 0–17 years that were reliant on a benefit recipient varied by DHB, with numbers ranging from 1,062 in the West Coast to 34,674 in Counties Manukau (**Table 10**).

Table 10. Number of children aged 0–17 years reliant on a benefit recipient by benefit type, for service centres in New Zealand's District Health Boards as at end of June 2014

	Sole Parent Support/EMA		Jobseeker Support		Supported Living Payment		Other main benefits		Total
DHB	No.	%*	No.	%*	No.	%*	No.	%*	
Northland	9,191	72.9	2,322	18.4	1,057	8.4	43	0.3	12,613
Waitemata	14,013	72.6	3,477	18.0	1,729	9.0	79	0.4	19,298
Auckland	9,593	66.7	3,455	24.0	1,202	8.4	140	1.0	14,390
Counties Manukau	25,244	72.8	6,217	17.9	3,069	8.9	144	0.4	34,674
Waikato	15,052	74.0	3,198	15.7	1,986	9.8	117	0.6	20,353
Bay of Plenty	8,200	76.2	1,812	16.8	675	6.3	77	0.7	10,764
Lakes	5,805	77.2	1,133	15.1	553	7.4	30	0.4	7,521
Tairawhiti	2,982	74.1	599	14.9	430	10.7	13	0.3	4,024
Taranaki	3,263	74.2	632	14.4	489	11.1	12	0.3	4,396
Hawke's Bay	7,074	74.6	1,289	13.6	1,069	11.3	45	0.5	9,477
MidCentral	5,672	69.2	1,415	17.3	983	12.0	122	1.5	8,192
Whanganui	2,789	70.6	752	19.0	391	9.9	18	0.5	3,950
Hutt Valley	4,648	74.9	1,045	16.8	482	7.8	32	0.5	6,207
Capital & Coast	5,580	69.6	1,601	20.0	768	9.6	67	0.8	8,016
Wairarapa	1,348	73.0	293	15.9	202	10.9	3	0.2	1,846
Nelson Marlborough	3,574	75.8	759	16.1	359	7.6	22	0.5	4,714
South Canterbury	1,152	74.4	200	12.9	192	12.4	4	0.3	1,548
Canterbury	9,122	73.9	1,545	12.5	1,601	13.0	69	0.6	12,337
West Coast	770	72.5	190	17.9	99	9.3	3	0.3	1,062
Southern	6,207	74.1	1,467	17.5	650	7.8	49	0.6	8,373
New Zealand	141,279	72.9	33,401	17.2	17,986	9.3	1,089	0.6	193,755

Source: MSD SWIFTT Database; Note: * % refers to percent of children relying on benefit recipients, rather than percent of all children; EMA: Emergency Maintenance Allowance; Non-benefit assistance not included; See Methods section for composition of "Other main benefits" and for Service Centres included for each DHB

YOUNG PEOPLE RELIANT ON BENEFITS

Introduction

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

Data source and methods

Definition

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

Data source

Numerator: SWIFTT Database: Number of young people aged 16–24 years who were reliant on a benefit
Denominator: Statistics NZ Estimated Resident Population as at 30 June

Notes on interpretation

Note 1: All data in this section were provided by the Ministry of Social Development (MSD) and were derived from the SWIFTT database. SWIFTT was developed by the NZ Income Support Service to calculate, provide and record income support payments and related client history [57]. It provides information on the recipients of financial assistance through Work and Income.

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

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

Note 4: Benefits prior to the June 2013 reform are not directly comparable with the benefits as at June 2014. Prior to 2014, "Other benefits" includes: Domestic Purposes Benefit - Women Alone and Caring for Sick or Infirm, Emergency Benefit, Independent Youth Benefit, Unemployment Benefit Training, and Unemployment Benefit Training Hardship, Unemployment Benefit Student Hardship, Widows Benefit, NZ Superannuation, Veterans and Transitional Retirement Benefit. "Other Benefits" *does not include* Orphan's and Unsupported Child's Benefits, and Non-benefit assistance.

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

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

Note 5: Service centres included for each DHB: Northland: Dargaville, Kaikohe, Kaitaia, Kamo, Kawakawa, Kerikeri, Onerahi, Whangarei Central; Waitemata: Albany, Birkenhead District, Browns Bay, Glenfield, Glenmall, Helensville, New Lynn, Orewa, Takapuna, Waitakere, Warkworth, Westgate; Auckland: Avondale, Grey Lynn, Mt Albert, Mt Eden, Onehunga, Otahuhu, Queen Street, Tamaki, Three Kings, Waiheke Panmure, Ponsonby/Grey Lynn, Pt, Chevalier, Queen Street (incl Super), Tamaki, Three Kings, Waiheke, AK Childcare Processing Centre; Counties Manukau: Clendon, Highland Park, Hunters Corner District, Mangere, Manukau District, Manurewa, Otara, Papakura, Papatoetoe, Pukekohe, Waiuku; Waikato: Cambridge, Dinsdale, Five Cross Roads, Glenview, Hamilton, Hamilton East, Huntly, Matamata, Morrinsville, Ngaruawhaia, Paeroa, Te Awamutu, Thames, Waihi, Taumarunui, Te Kuiti, Tokoroa; Bay of Plenty: Greerton, Kawerau, Mount Maunganui, Opotiki, Tauranga, Te Puke, Whakatane; Lakes: Rotorua, Taupo; Tairawhiti: Gisborne, Kaiti, Ruatoria; Taranaki: Hawera, New Plymouth, Stratford, Waitara; Hawke's Bay: Flaxmere, Hastings Community Link, Napier, Taradale, Waipukurau, Wairoa; MidCentral: Dannevirke, Feilding, Foxton, Horowhenua, Otaki, Palmerston North; Whanganui: Marton, Taihape, Whanganui; Hutt Valley: Lower Hutt, Naenae, Upper Hutt, Wainuiomata; Capital & Coast: Kapiti, Johnsonville, Kilbirnie, Newtown, Porirua, Wellington; Wairarapa: Wairarapa; Nelson Marlborough: Blenheim, Motueka, Nelson, Nelson Region Processing Unit, Richmond; South Canterbury: Timaru; Canterbury: Actionworks, Ashburton, Hornby, Kaiapoi, Linwood, New Brighton, Papanui, Rangiora, Riccarton, Shirley, Sydenham; West Coast: Greymouth, Westport; Southern: Alexandra, Balclutha, Dunedin Central, Mosgiel, Oamaru, South Dunedin, Gore, Invercargill, Queenstown

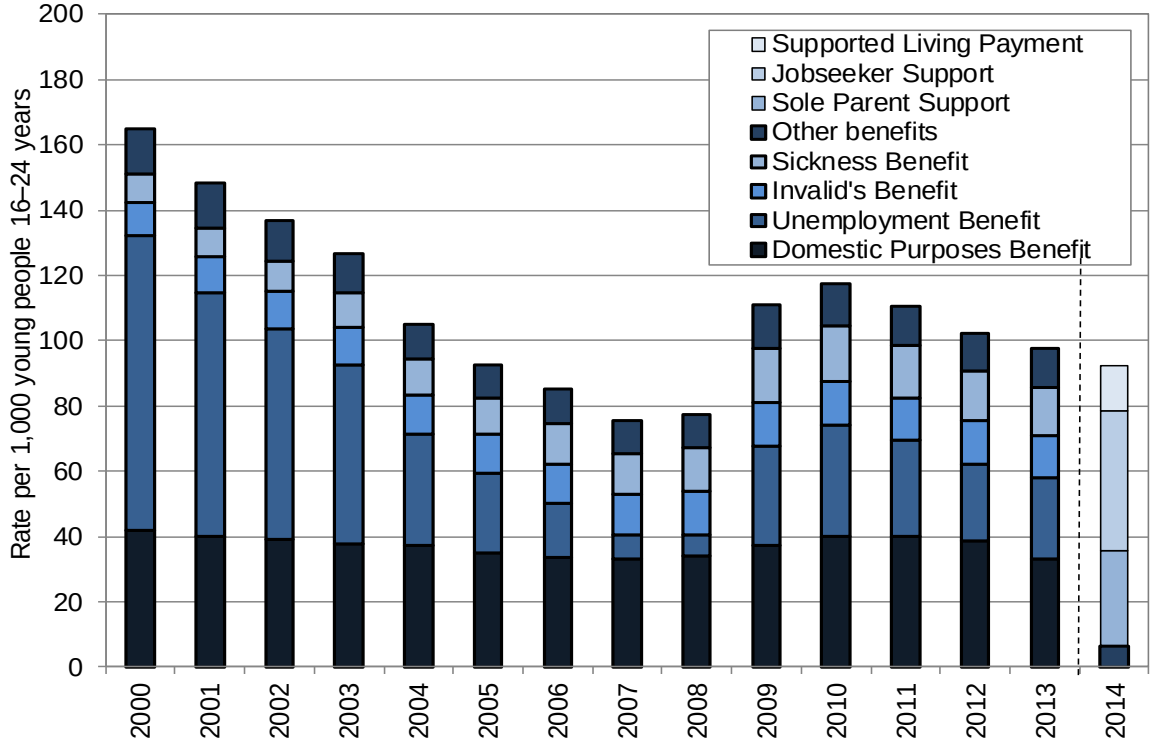
New Zealand distribution and trends

Number of young people reliant on benefits

In New Zealand during June 2000–2013, there were large fluctuations in the number of young people aged 16–24 years reliant on a benefit (Table 11), with rates falling from 165.1 per 1,000 in June 2000, to 75.5 per 1,000 in June 2007, before increasing again to 117.5 per 1,000 in June 2010. By June 2013, the rate was 97.6 per 1,000 (**Table 11**). When broken down by benefit type, the largest initial declines were seen for those reliant on an unemployment benefit, with rates falling from 89.9 per 1,000 in June 2000, to 8.6 per 1,000 in 2008, before increasing to 34.3 per 1,000 in 2010. By June 2013 the rate was 24.6 per 1,000. In contrast, the proportion reliant on a domestic purposes benefit declined much more slowly, from 42.1 per 1,000 in June 2000, to 32.9 per 1,000 in 2007, before increasing again to 40.0 in 2011. The proportion reliant on invalid's and sickness benefits, however, increased through most of 2000–2013. Thus by June 2013, 13.3 per 1,000 young people were reliant on an invalid's benefit, and 14.7 per 1,000 on a sickness benefit (**Table 11, Figure 30**).

In June 2014, following the welfare reform in July 2013, the number of young people reliant on a benefit was 52,663. The majority were reliant on the Jobseeker Support, followed by Sole Parent Support (**Table 11**).

Figure 30. Proportion of young people aged 16–24 years receiving a benefit by benefit type, New Zealand June 2000–2014



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

Table 11. Number and proportion of young people aged 16–24 years receiving a benefit by benefit type, New Zealand June 2000–2014

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

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

New Zealand distribution by ethnicity

Jobseeker Support

In New Zealand as at June 2014, 42.7 per 1,000 young people were reliant on a Jobseeker Support benefit. The Jobseeker Support reliance rate was higher for Māori (84.5 per 1,000 Māori young people) than for non-Māori non-Pacific young people (37.1 per 1,000 non-Māori non-Pacific young people) (**Figure 31**).

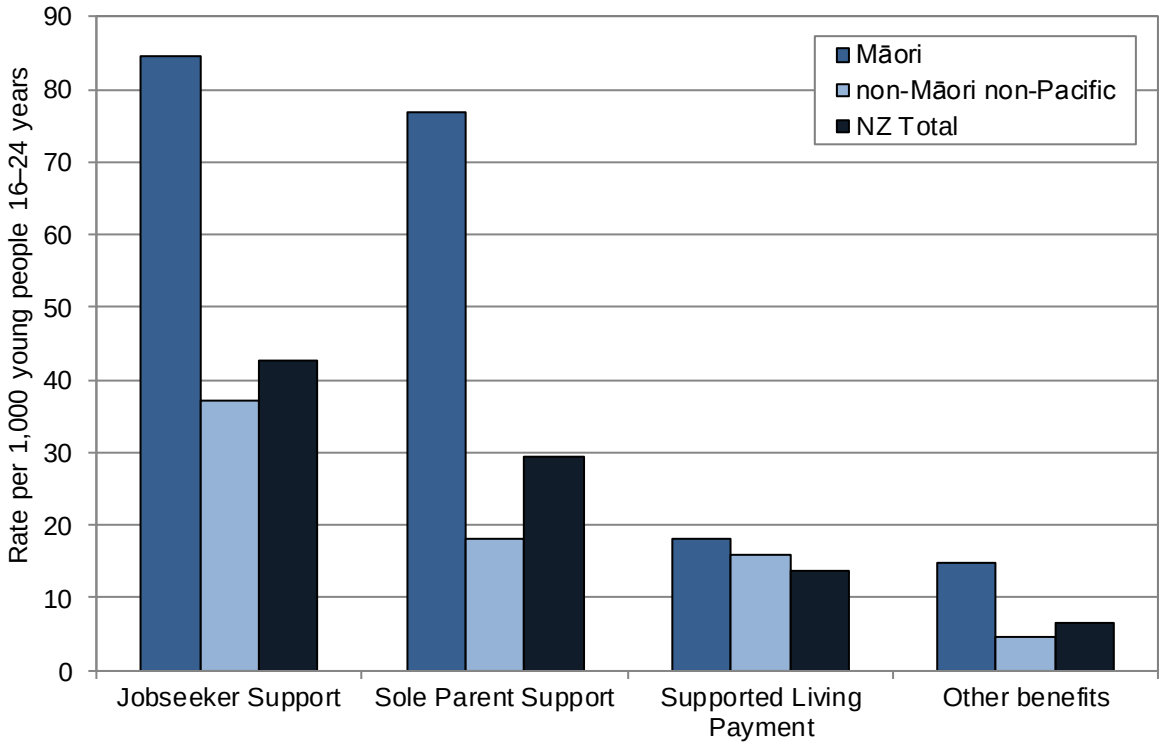
Sole Parent Support

In New Zealand as at June 2014, 29.4 per 1,000 young people were reliant on Sole Parent Support. The reliance rate was higher for Māori (76.7 per 1,000 Māori young people) than for non-Māori non-Pacific young people (18.1 per 1,000 non-Māori non-Pacific young people) (**Figure 31**).

Supported Living Payment

In New Zealand as at June 2014, 13.8 per 1,000 young people were reliant on a Supported Living Payment. The reliance rate was higher for Māori (18.2 per 1,000 Māori young people) than for non-Māori non-Pacific young people (15.9 per 1,000 non-Māori non-Pacific young people) (**Figure 31**).

Figure 31. Proportion of young people aged 16–24 years receiving benefit by benefit type and ethnicity, New Zealand as at June 2014

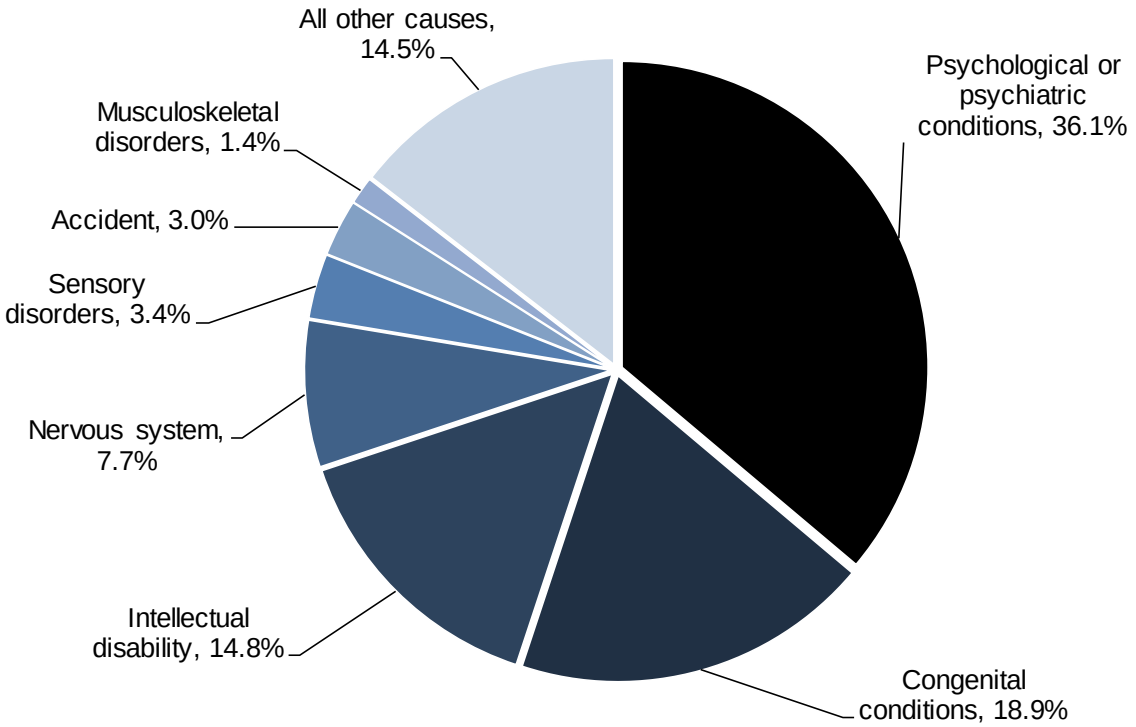


Source: Numerator: MSD SWIFTT database; Denominator: Statistics NZ Estimated Resident Population; Note: For composition of "Other benefits" see Methods box

Distribution of Supported Living Payment by cause of incapacity

In New Zealand during June 2014, 36.1% of young people receiving a Supported Living Payment benefit required financial support for psychological or psychiatric reasons, while 14.8% required support for intellectual disabilities. An additional 18.9% required support as the result of congenital conditions, and 7.7% as the result of nervous system problems (**Figure 32**).

Figure 32. Proportion of young people aged 16–24 years receiving a Supported Living Payment by cause of incapacity, New Zealand June 2014 (n=7,888)



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

Distribution by DHB

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

At the end of June 2014 the number of young people aged 16–24 years that were reliant on a benefit varied by DHB, with numbers ranging from 338 in the West Coast to 6,689 in Counties Manukau (**Table 12**).

Table 12. Number of young people aged 16–24 years receiving a benefit by benefit type, for service centres in New Zealand's District Health Board catchments, at end June 2014

	Jobseeker Support		Sole Parent Support/EMA		Supported Living Payment		Other main benefits		Total
DHB	No.	%*	No.	%*	No.	%*	No.	%*	
Northland	1,515	53.4	1,017	35.8	297	10.5	10	0.4	2,839
Waitemata	2,438	50.7	1,535	31.9	812	16.9	20	0.4	4,805
Auckland	1,664	51.1	958	29.4	598	18.4	37	1.1	3,257
Counties Manukau	2,719	40.6	2,911	43.5	1,037	15.5	22	0.3	6,689
Waikato	2,771	50.3	1,836	33.3	849	15.4	54	1.0	5,510
Bay of Plenty	1,302	49.8	973	37.2	309	11.8	30	1.1	2,614
Lakes	858	49.4	675	38.8	195	11.2	10	0.6	1,738
Tairawhiti	340	41.3	350	42.5	128	15.6	5	0.6	823
Taranaki	537	46.6	418	36.3	194	16.8	4	0.3	1,153
Hawke's Bay	1,093	47.1	874	37.7	340	14.6	14	0.6	2,321
MidCentral	1,337	52.3	731	28.6	439	17.2	50	2.0	2,557
Whanganui	616	56.4	318	29.1	151	13.8	8	0.7	1,093
Hutt Valley	1,119	54.9	613	30.1	292	14.3	15	0.7	2,039
Capital & Coast	1,665	60.2	657	23.7	434	15.7	11	0.4	2,767
Wairarapa	318	52.3	187	30.8	101	16.6	2	0.3	608
Nelson Marlborough	613	50.3	372	30.5	227	18.6	6	0.5	1,218
South Canterbury	165	40.1	157	38.2	88	21.4	1	0.2	411
Canterbury	1,393	40.0	1,188	34.1	875	25.1	27	0.8	3,483
West Coast	206	60.9	91	26.9	39	11.5	2	0.6	338
Southern	1,624	56.9	760	26.6	458	16.0	13	0.5	2,855
New Zealand	24,293	49.5	16,621	33.8	7,863	16.0	341	0.7	49,118

Source: MSD SWIFTT database; Note: * % refers to percent of young people receiving a benefit, rather than percent of all young people; EMA is Emergency Maintenance Allowance; Non-benefit assistance not included See Methods box for composition of "Other benefits" and for Service Centres included in each DHB

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

Introduction

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

Statistics New Zealand defines NEET as "people aged 15–24 years who are not in employment, education, or training" and states that NEET includes both those people who are unemployed and not in education and those who are not in the labour force and, at the same time, not in education or training [58]. The distinction between "unemployed" and "not in the labour force" is that those classified as unemployed are available for work and actively looking for work whereas those classified as "not in the labour force" are not. Some those who are not part of the labour force are engaged in unpaid caregiving.

Background

Young people are particularly vulnerable to the effects of economic downturns. Data from OECD countries indicated that, during the recession of 2008–9, in most OECD countries, youth unemployment rates rose more rapidly than adult unemployment rates [59]. Unemployment statistics do not fully capture the situation of young people as many are students and therefore not part of the full time workforce. When jobs are hard to get, young people's participation in further education tends to increase. Policymakers developed the concept of NEET "not in employment, education or training" to facilitate comparisons between countries and to increase the visibility on the policy agenda of an especially vulnerable group of young people [60]. Young people who spend time NEET are at higher risk of becoming socially, economically and politically disengaged from the rest of society and of insecure and poor quality future employment, youth offending and mental and physical health problems [60].

Introduction

Data source and methods

Definition

The NEET Rate is calculated as [58]:

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

Data Source

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

Notes on interpretation

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

(a) had actively sought work in the past four weeks ending with the reference week, or
(b) had a new job to start within four weeks [54]

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

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

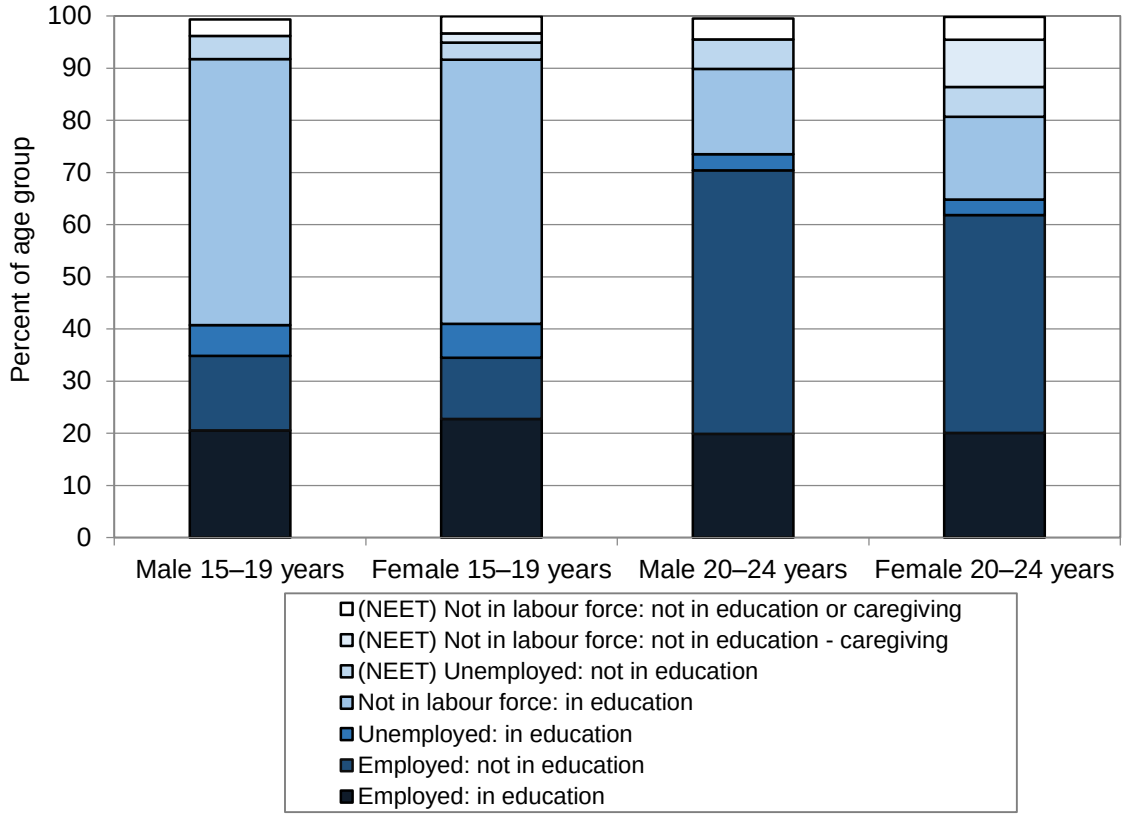
Note 2: Seasonal adjustment makes data for adjacent quarters more comparable by smoothing out the effects of any regular seasonal events. This ensures the underlying movements in time series are more visible. Each quarter, the seasonal adjustment process is applied to the latest and all previous quarters. This means that seasonally adjusted estimates for previously published quarters may change slightly [55].

New Zealand distribution and trends

Labour force status by age and gender

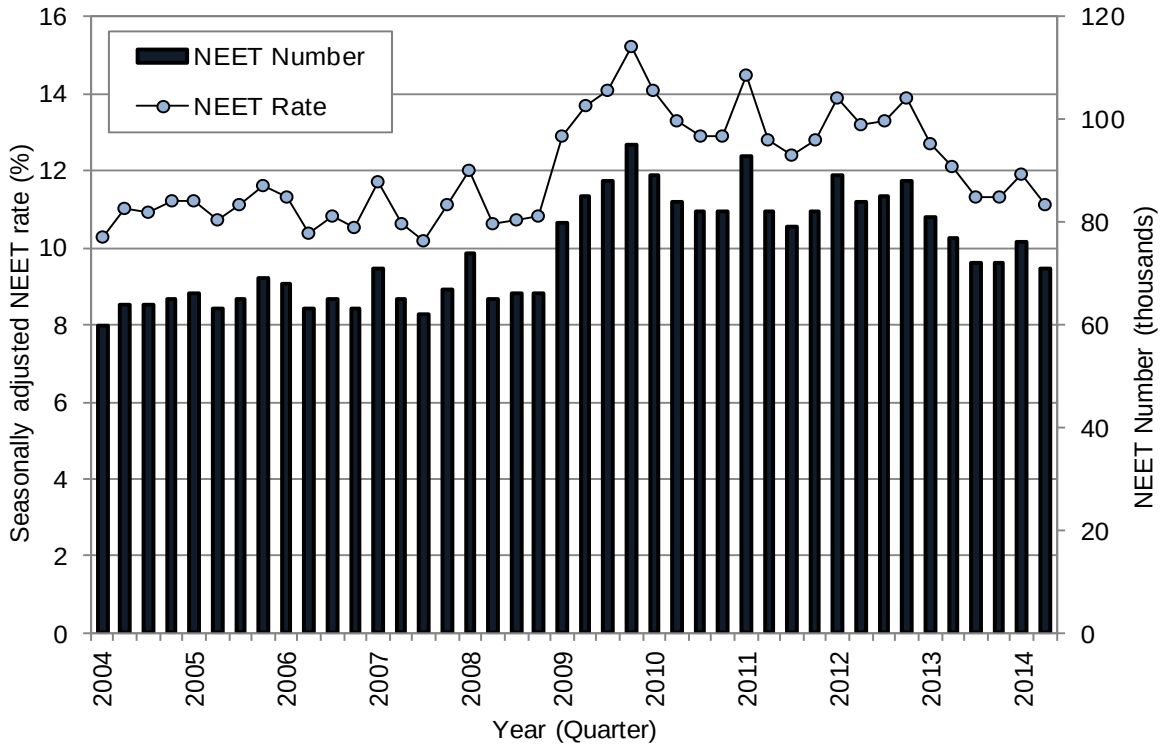
In New Zealand during 2014, the majority of young people were in work, education or training, with the largest category for 15–19 year olds being *not in the labour force: in education* (51% of both males and females). In contrast, the largest category for 20–24 year olds was *employed: not in education* (50.5% of males and 41.8% of females). For those in the NEET category, gender differences in the proportions in the *unemployed: not in education* and *not in the labour force: not in education or caregiving* categories were not marked. However, a much higher proportion of females than males were in the *not in the labour force: not in education-caregiving* category, with gender differences being most marked in the 20–24 year age group (**Figure 33**).

Figure 33. Labour force status of young people by age and gender, New Zealand 2014



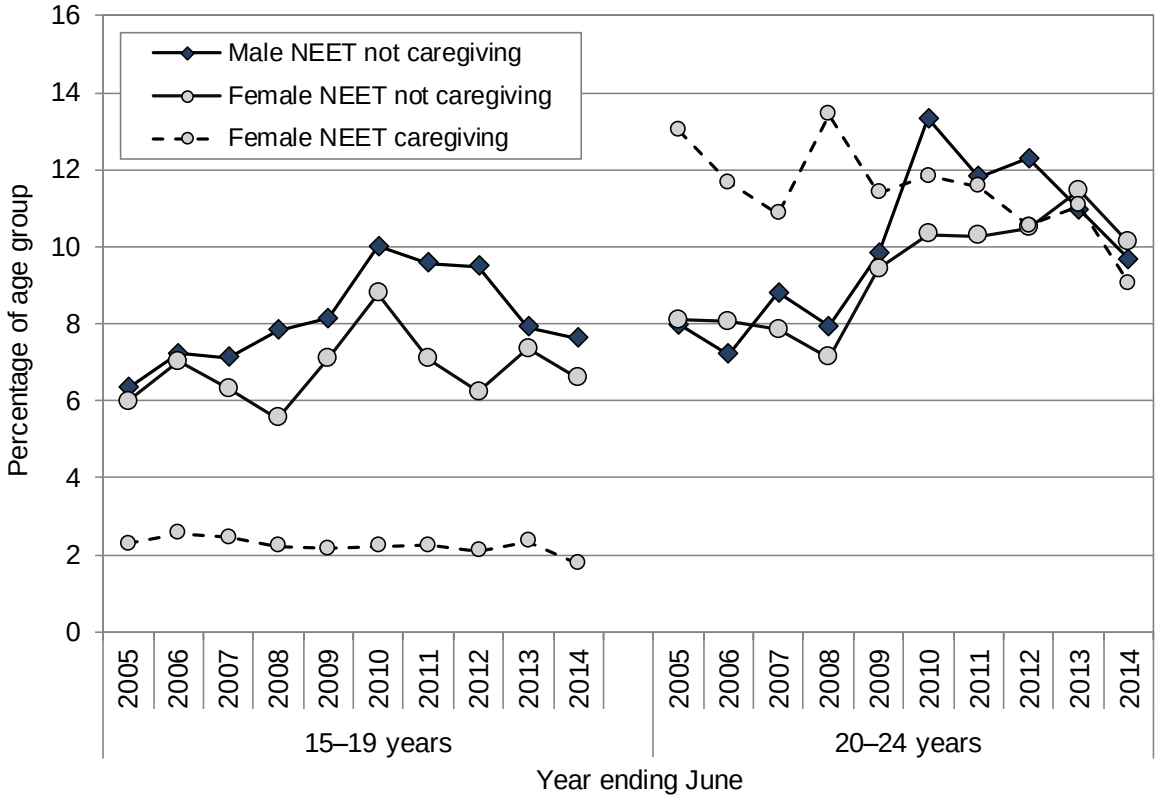
Source: Statistics New Zealand Household Labour Force Survey

Figure 34. Seasonally adjusted quarterly NEET rates in young people aged 15–24 years, New Zealand March 2004–June 2014



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

Figure 35. Young people not engaged in employment, education or training by age and caregiving status, New Zealand years ending June 2005–2014



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

Seasonally adjusted NEET rates

In New Zealand, seasonally adjusted NEET rates were relatively static during 2004–2008 but began to rise thereafter, reaching their highest point, at 15.2% (n=95,000), in the fourth quarter of 2009. Since then, rates have exhibited a general downward trend, with rates in the June 2014 quarter being 11.1% (n=71,000) (**Figure 34**).

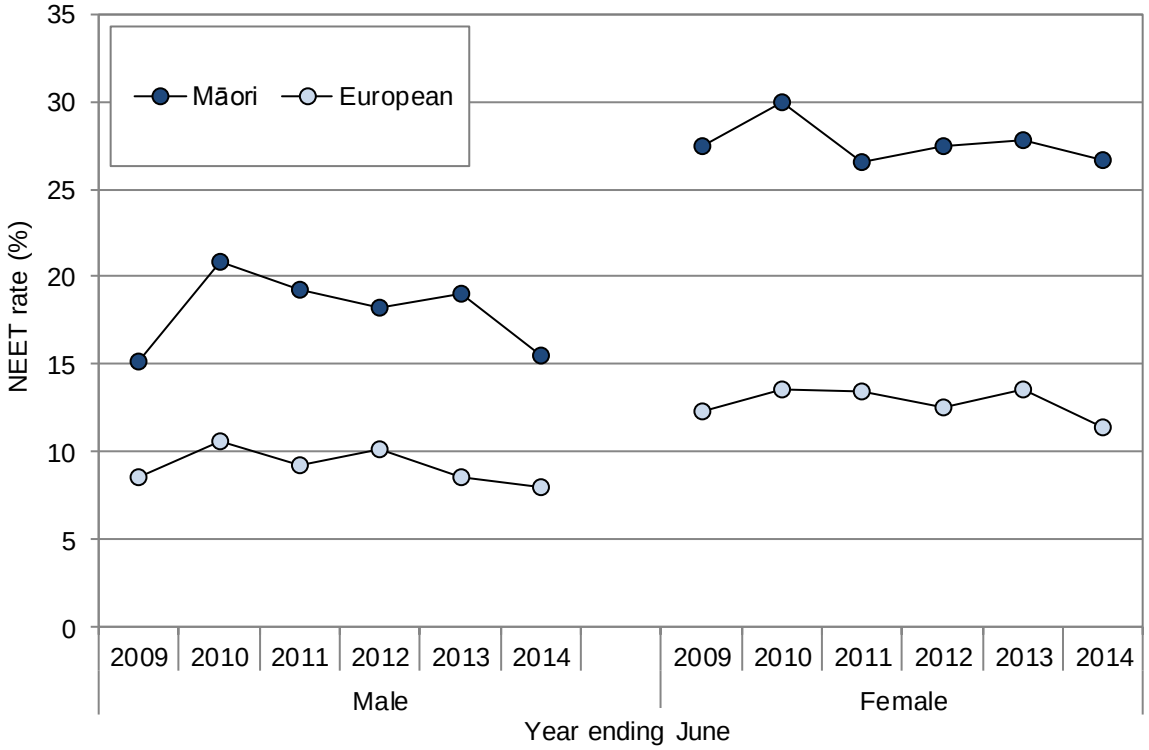
NEET rates by age and caregiving status

In New Zealand NEET rates in young people who were not engaged in caregiving roles increased between 2008 and 2010, and then (with the exception of females aged 20–24 years) gradually declined thereafter. In contrast, NEET rates in females aged 15–19 years engaged in caregiving roles were static during 2009–2014, while rates for females aged 20–24 years fluctuated during 2005–2011 and then declined (**Figure 35**)

NEET rates by ethnicity

In New Zealand during 2009–2014, NEET rates were higher for Māori than for non-Māori non-Pacific young people. NEET rates were higher for females than for males in both ethnic groups (**Figure 36**). In the year ending June 2014, NEET rates were 15.5% for Māori males and 8% for European males, and 26.7% for Māori females and 11.4% for European females.

Figure 36. NEET rates in young people by gender and ethnicity, New Zealand years ending June 2009–2014

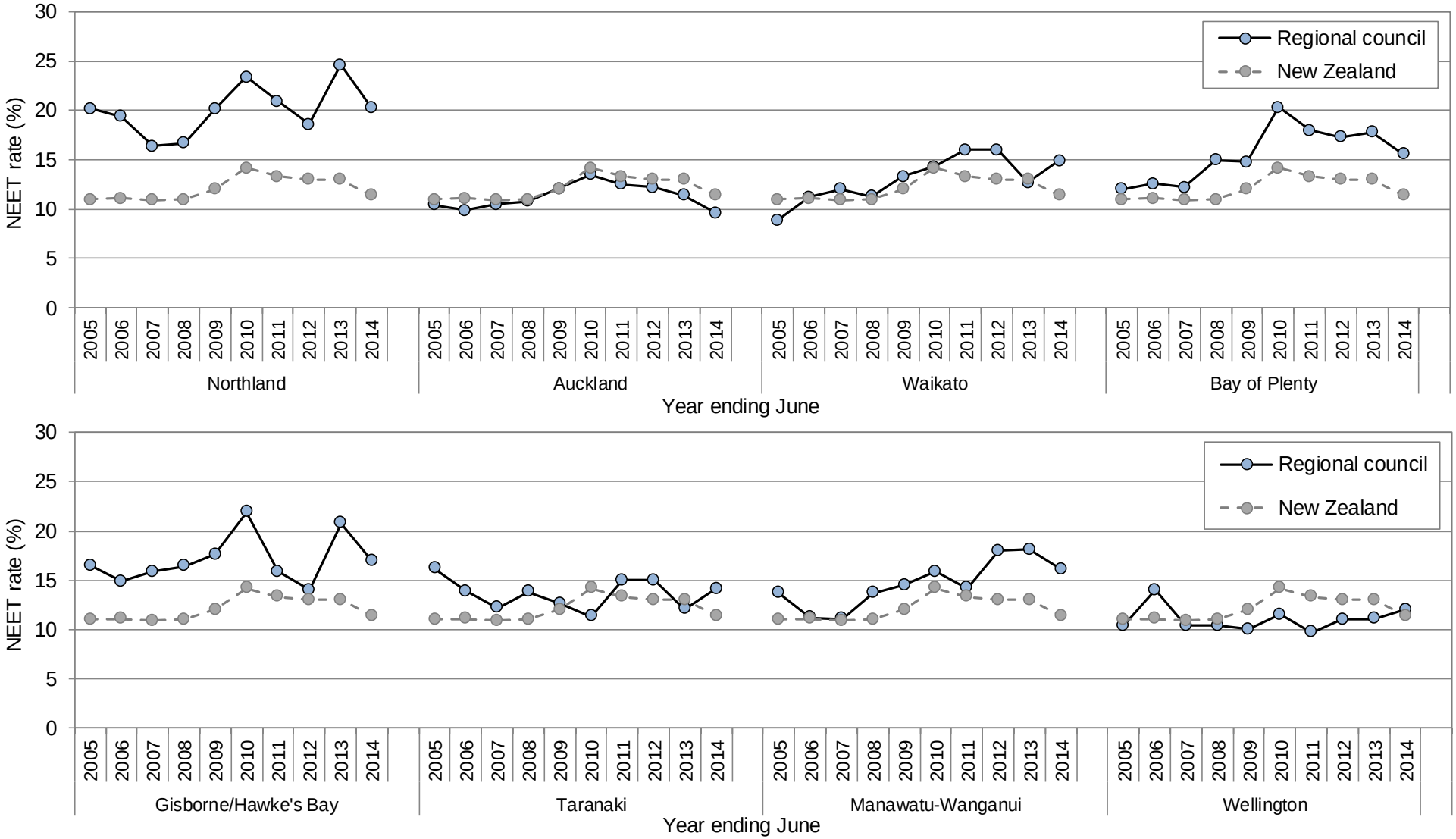


Source: Statistics New Zealand, Household Labour Force Survey; Note: Ethnicity is total response

Distribution by Regional Council

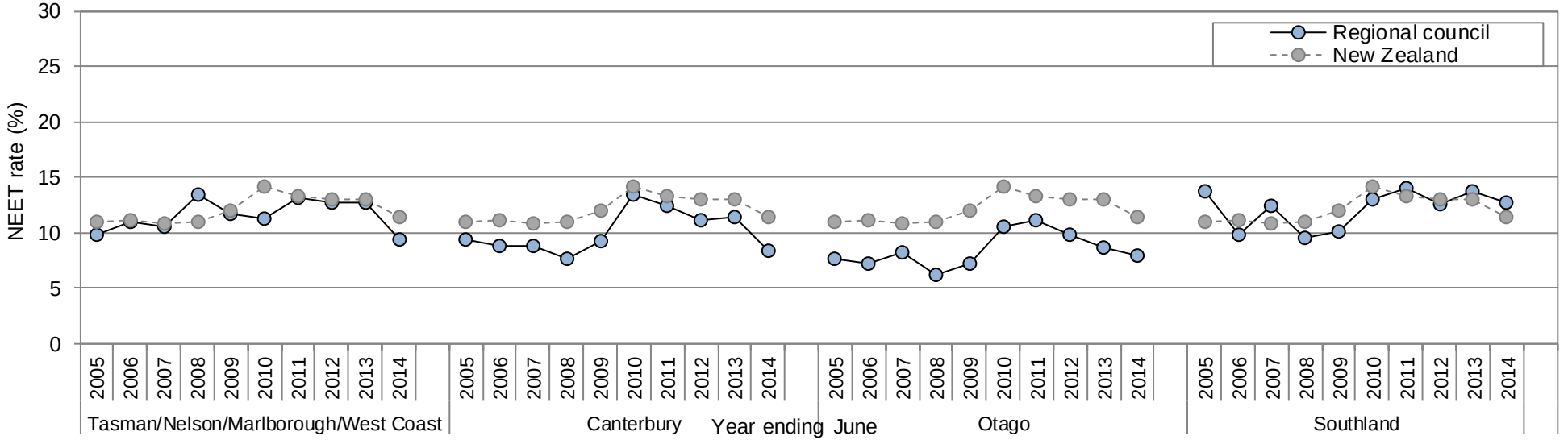
In New Zealand during June 2005–2014, the proportion of young people aged 15–24 years who were not in education, employment or training varied by regional council. While the trends for individual regions varied, in general NEET rates in Northland, the Bay of Plenty, Gisborne/Hawke's Bay and the Manawatu/Whanganui were higher than the New Zealand rate, while rates in Canterbury and Otago were lower (**Figure 37, Figure 38**).

Figure 37. NEET rates in young people aged 15–24 years by regional council, North Island councils vs New Zealand years ending June 2005–2014



Source: Statistics New Zealand Household Labour Force Survey

Figure 38. NEET rates in young people aged 15–24 years by regional council, South Island councils vs New Zealand years ending June 2005–2014



Source: Statistics New Zealand Household Labour Force Survey

SOCIOECONOMIC AND CULTURAL DETERMINANTS

HOUSEHOLD COMPOSITION

CHILDREN IN SOLE PARENT HOUSEHOLDS

Introduction

The following section uses data from the 2001, 2006, and 2013 Censuses to review the proportion of Māori children aged 0–14 years living in sole parent households.

Background

Almost 30% of children in New Zealand live in sole parent families [61] and it is estimated that around one third of children experience some period of time living with only one parent [62]. Contrary to popular stereotypes, most children in sole parent families were not born to women living without partners and most sole parents are not teenagers. In 2006, the average age of sole parents was thirty-eight [63]. The "Growing Up in New Zealand" study found that 89% of their cohort of approximately 7,000 children from the greater Auckland and Waikato regions were, at two years of age, living with two parents, either in single or extended family households [64].

It is well-recognised that parental relationship breakdown has harmful effects on children, but there is debate about whether these effects stem from the breakdown itself or the multiple associated adversities, particularly poverty [65]. That Māori children are twice as likely as European children to be living in poverty is consistent with the relatively high proportion of Māori children living in sole parent or beneficiary households [30]. A 2009 literature review found consistent evidence for an association between parental relationship breakdown and socio-economic disadvantage, and also children's psychological ill-health, physical ill-health, lower educational achievement, substance misuse and other health-damaging behaviours, and behavioural problems including conduct disorder, anti-social behaviour and crime. It noted that not all children experience these consequences and most adjust to their new situation after a period of instability, but that multiple relationship transitions are particularly detrimental for children [65].

Data source and methods

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

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

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

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

New Zealand distribution and trends

New Zealand trends

In New Zealand, the proportion of Māori children who lived in sole parent households declined from 43.9% in 2001 to 42.0% in 2013. The proportion of non-Māori non-Pacific children who lived in sole parent households also declined, from 19.3% in 2001 to 16.0% in 2013 (**Figure 39**).

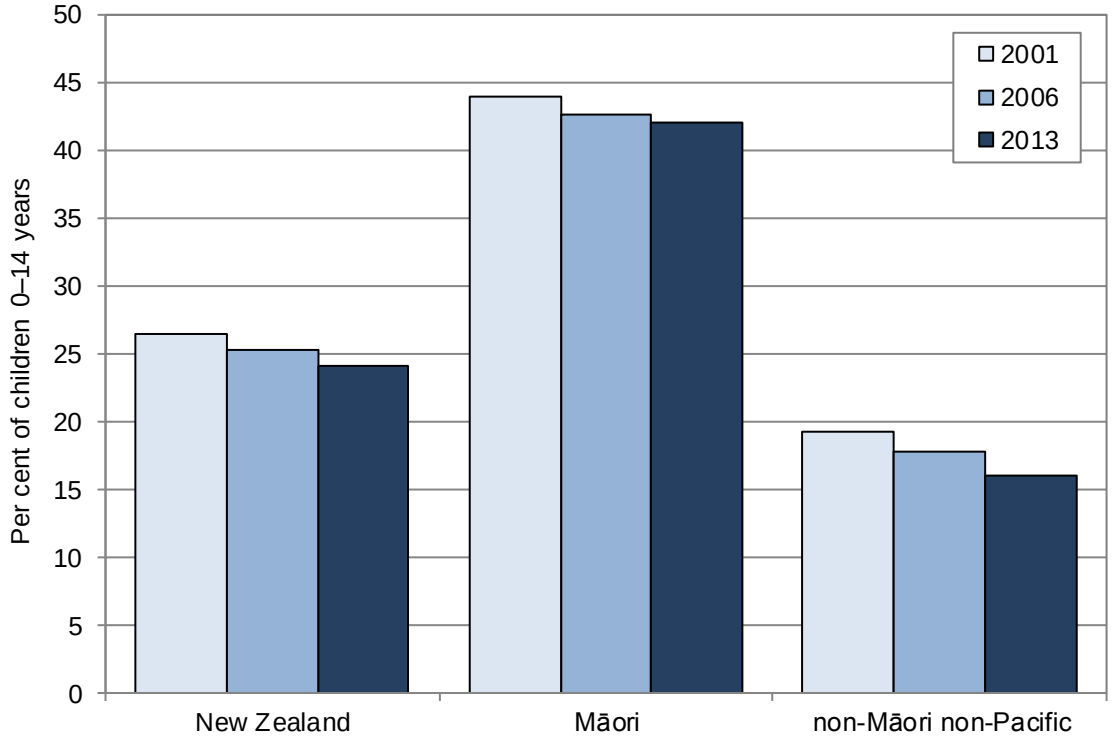
Distribution by ethnicity

At the 2013 Census, 42.0% of Māori children lived in sole parent households compared to 16.0 % of non-Māori non-Pacific children. The proportion of Māori children who lived in sole parent households was *significantly higher* than for non-Māori non-Pacific children (**Table 13**).

Distribution by ethnicity and NZ Deprivation Index Decile

At the 2013 Census, the proportion of children who lived in sole parent households increased with increasing NZDep deprivation for both Māori and non-Māori non-Pacific children. At each level of NZDep deprivation a higher proportion of Māori than non-Māori non-Pacific children lived in sole parent households (**Figure 40**).

Figure 39. Proportion of children aged 0–14 years who lived in sole parent households by ethnicity, New Zealand at the 2001, 2006, and 2013 Censuses



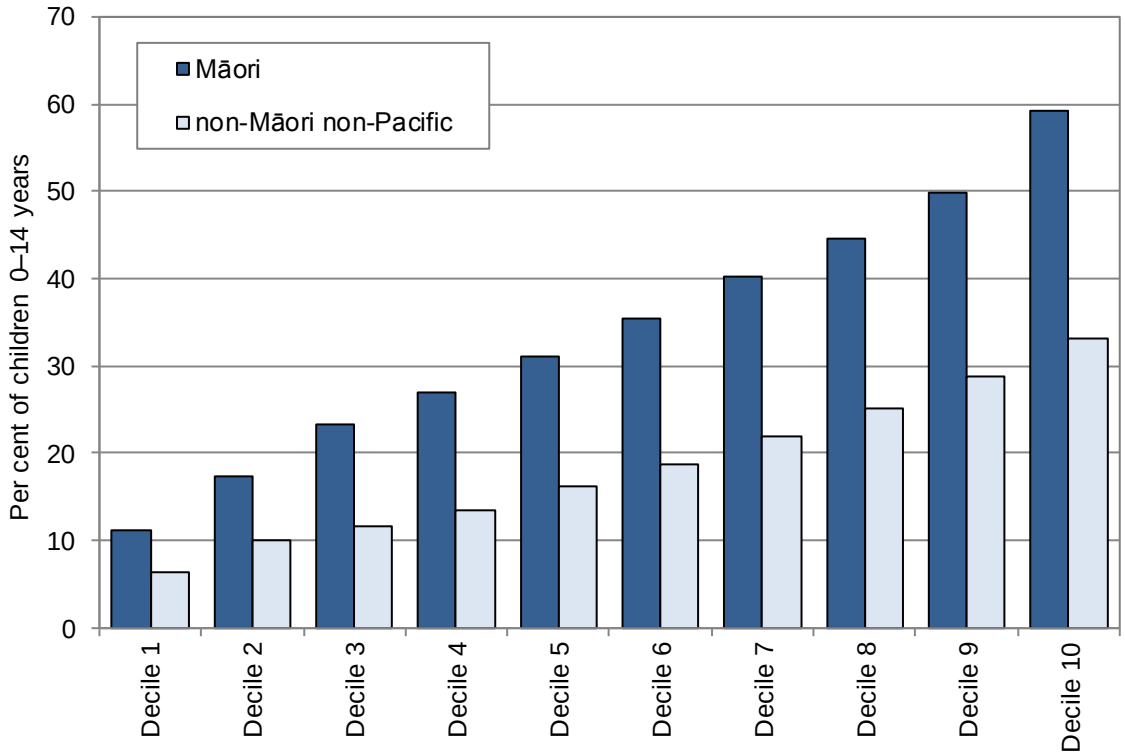
Source: Statistics New Zealand; Note: Ethnicity is level 1 prioritised

Table 13. Number and proportion of children aged 0–14 years living in sole parent households by ethnicity, New Zealand at the 2013 Census

Ethnicity	Number of children	Percent of children	Rate ratio	95% CI
Children aged 0–14 years living in sole parent households				
Māori	82,476	42.0	2.63	2.61–2.65
non-Māori non-Pacific	82,734	16.0	1.00	

Source: Statistics New Zealand; Note: Ethnicity is level 1 prioritised. Percent of children is percent of children within ethnic group who lived in sole parent households, not percent of all children

Figure 40. Proportion of children aged 0–14 years living in sole parent households by ethnicity and NZ Deprivation Index decile, New Zealand at the 2013 Census



Source: Statistics New Zealand; Note: Rate is per cent of children in each deprivation category

Distribution by DHB

At the 2013 Census, the proportion of Māori children aged 0–14 years living in sole parent households varied by DHB, with rates ranging from 28.0% in the West Coast to 49.6% in Counties Manukau. Within each of the DHBs, the proportion of Māori children living in sole parent households was *significantly* higher than for non-Māori non-Pacific children (**Table 14**).

Table 14. Proportion of children 0–14 years living in sole parent households by ethnicity and district health board, New Zealand at the 2013 census

DHB	Māori rate (%)	non-Māori non-Pacific rate (%)	Rate ratio	95% CI
Children 0–14 years living in sole parent households				
Northland	44.4	17.9	2.48	2.39–2.59
Waitemata	37.9	14.4	2.63	2.56–2.70
Auckland	42.3	12.4	3.42	3.30–3.54
Counties Manukau	49.6	14.3	3.46	3.38–3.55
Waikato	43.4	17.4	2.50	2.43–2.56
Bay of Plenty	42.6	18.7	2.28	2.20–2.35
Lakes	44.6	17.3	2.57	2.44–2.70
Tairawhiti	46.0	16.8	2.74	2.52–2.98
Taranaki	38.5	18.0	2.14	2.04–2.24
Hawke's Bay	46.6	19.3	2.41	2.33–2.50
MidCentral	42.1	20.5	2.06	1.98–2.13
Whanganui	43.2	23.6	1.83	1.73–1.93
Hutt Valley	42.2	16.6	2.54	2.44–2.66
Capital & Coast	38.0	12.6	3.03	2.91–3.15
Wairarapa	38.5	19.6	1.96	1.81–2.12
Nelson Marlborough	37.2	18.2	2.04	1.94–2.15
South Canterbury	31.3	16.3	1.92	1.75–2.11
Canterbury	33.2	16.0	2.08	2.02–2.15
West Coast	28.0	18.2	1.54	1.37–1.73
Southern	31.8	16.4	1.94	1.87–2.01
New Zealand	42.0	16.0	2.63	

Source: Statistics New Zealand

HOUSEHOLD CROWDING

Introduction

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

Background

In New Zealand, household crowding has been linked to meningococcal disease and acute rheumatic fever in children [66,67]. Internationally, research has suggested correlations between crowding and tuberculosis, respiratory infections, hepatitis B and other enteric diseases, conjunctivitis, and poor mental health outcomes [68]. Proposed mechanisms for these associations include closer, more prolonged and increased frequency of contact between children and people with infectious diseases, and increased exposure to second-hand tobacco smoke [68].

Crowding is more common among low-income households, households in rental accommodation (particularly state owned rental accommodation), younger households, single parent households, households with more dependent children, and households that include two or more families [69]. Māori people are more likely than NZ Europeans to live in rental properties, and home ownership declined more substantially for Māori than for NZ Europeans between 1991 and 2006 [70]. Research suggests that rental accommodation tends to be of lower quality than owner-occupied homes, and more likely to lack insulation and to be prone to damp and mould [71].

Data source and methods

Definition

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

Data source

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

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

Notes on interpretation

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

Note 2: The Canadian National Occupancy Standard (CNOS) definitions were developed in Canada in the 1980s to enable the calculation of person-to-bedroom ratios for households of differing sizes and compositions [72]. Using the CNOS, Statistics New Zealand defines household crowding as a deficit of at least one bedroom according to the standard of: no more than two people per bedroom; couples can share a room; children under 5 of either gender or under 18 years of the same gender can share a room; children aged 5 to 17 years should not share a room with a child under 5 of the opposite gender; single adults and unpaired children should have a separate room [72].

The CNOS was used in the 2001, 2006, and 2013 NZ censuses, and households were reported as having two plus, one or no bedrooms spare, or as requiring an additional one, or two plus bedrooms. Households needing one or two plus additional bedrooms are deemed to be crowded [72].

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

New Zealand distribution and trends

Distribution by household bedroom requirements

At the 2013 census, 9.4% of Māori children aged 0–14 years lived in households with two or more spare bedrooms, while 28.7% lived in households with one spare bedroom. A further 16.6% lived in households requiring one additional bedroom, while 8.4% lived in households requiring two or more additional bedrooms (**Figure 41**).

New Zealand trends

The proportion of Māori children living in crowded households (i.e. households requiring one or more additional bedrooms) declined slightly between censuses. It was 28.6% in 2001, 27.8% in 2006 and 24.8% in 2013 (**Figure 42**).

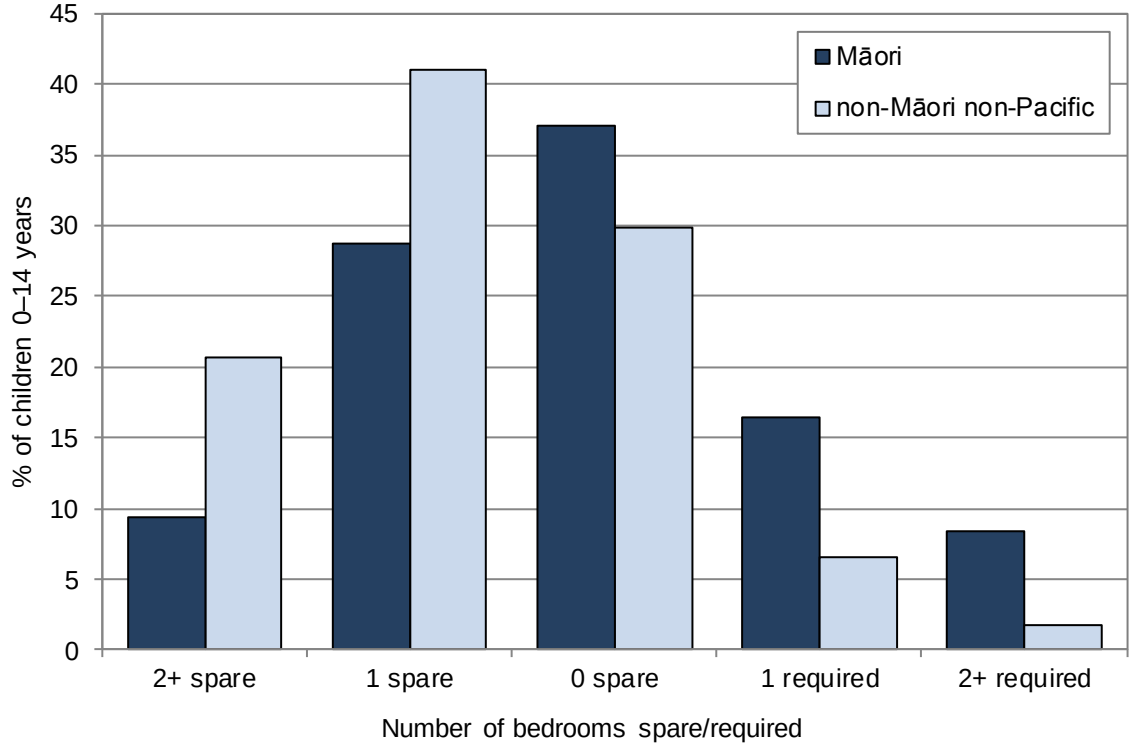
Distribution by ethnicity

At the 2013 census, 24.8% of Māori children lived in crowded households, compared to 8.4% of non-Māori non-Pacific children. Household crowding rates for, Māori children were *significantly higher* than for non-Māori non-Pacific children (**Figure 41, Figure 42, Table 15**). Household crowding rates for children of all ethnic groups declined slightly between 2001 and 2013.

Distribution by ethnicity and NZ Deprivation Index Decile

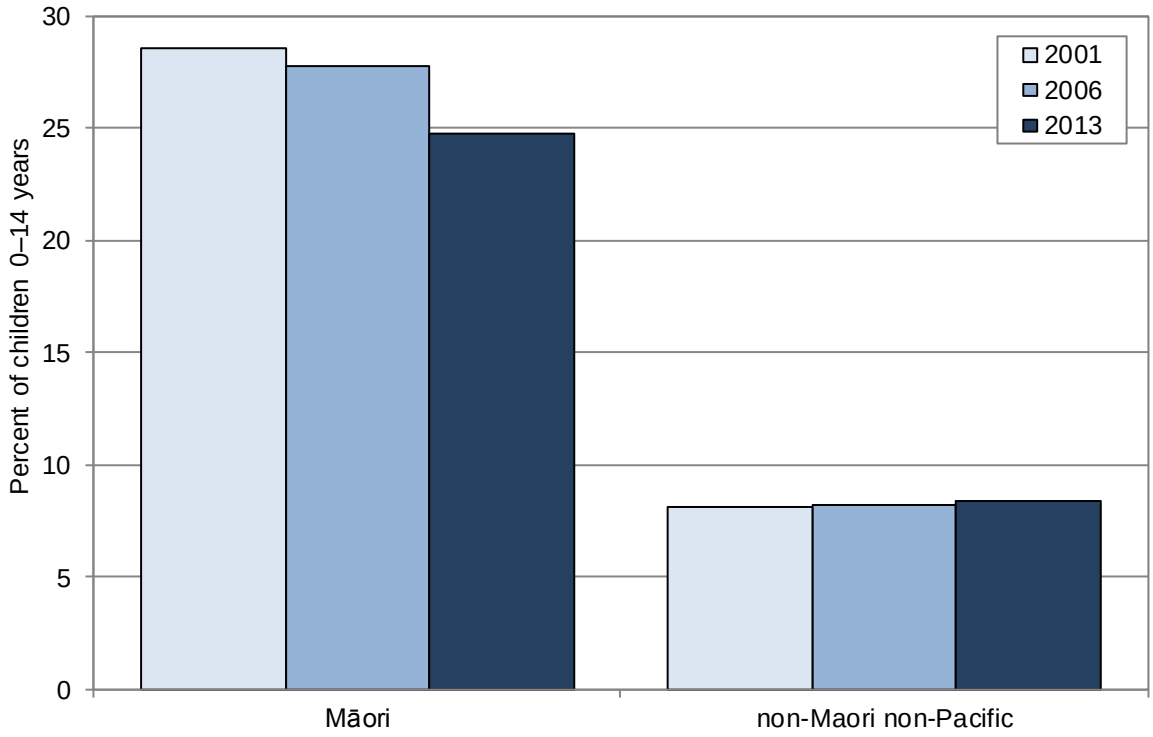
At the 2013 census, the proportion of Māori children living in crowded households increased with increasing deprivation, from 3.8% for those in the least deprived areas (NZDep decile 1) to 41.9% for those in the most deprived areas (NZDep decile 10). Crowding rates for Māori children in the areas with the most deprived NZDep scores were over 10 times higher than for children in the least deprived 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 43**). See Note 3 in Methods box for further interpretation.

Figure 41. Proportion of children aged 0–14 years by the number of bedrooms spare or required in their household, New Zealand at the 2013 censuses, by ethnicity



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

Figure 42. Proportion of children aged 0–14 years living in crowded households by ethnicity, New Zealand at the 2001, 2006 and 2013 censuses



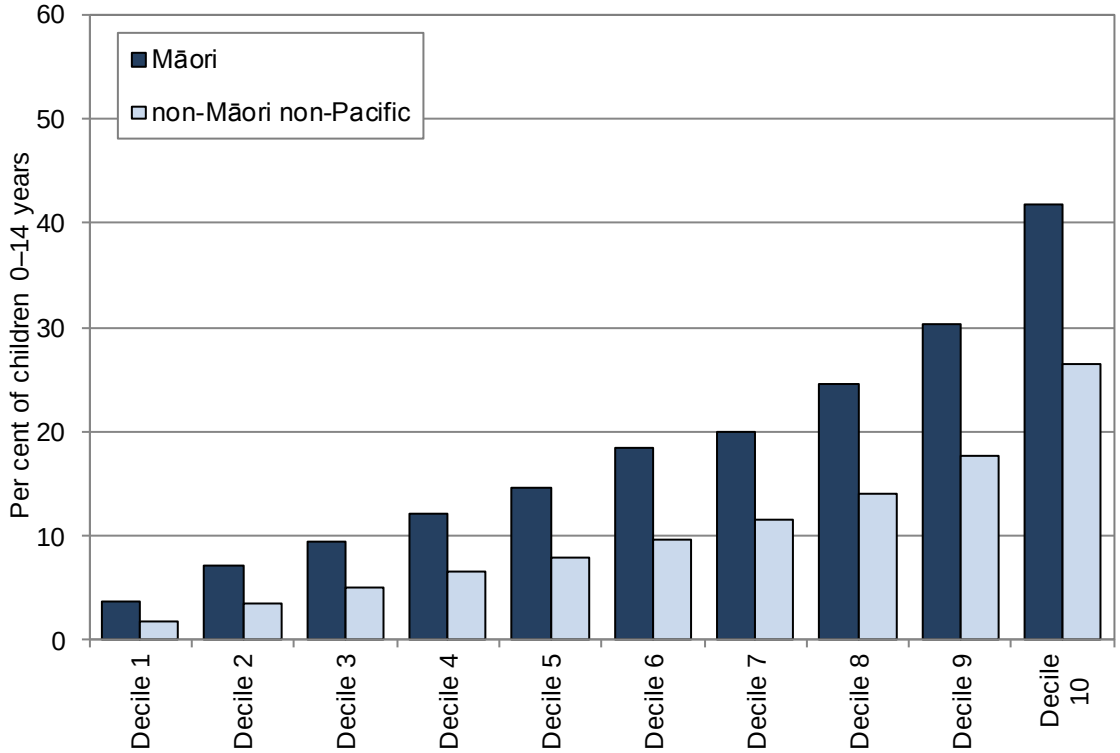
Source: Statistics New Zealand; Note: Ethnicity is level 1 prioritised

Table 15. Number and proportion of children aged 0–14 years living in crowded households by ethnicity, New Zealand at the 2013 census

	Number of children	Percent of children	Rate ratio	95% CI
Ethnicity				
Māori	47,724	24.8	2.94	2.91–2.98
non-Māori non-Pacific	45,300	8.4	1.00	

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

Figure 43. Proportion of children aged 0–14 years living in crowded households by ethnicity and NZ Deprivation Index decile, New Zealand at the 2013 census



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

Distribution by Territorial Local Authority

At the 2013 census, the proportion of all children who were living in crowded households varied by Territorial Local Authority with the proportion ranging from 4.0% in Selwyn District to 29.1% in Opotiki District. The largest number of children living in crowded households (n=61,272) resided in the Auckland Region (**Table 16, Table 17**).

Table 16. Proportion of all North Island children aged 0–14 years who were living in crowded households by Territorial Local Authority, New Zealand at the 2013 census

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

Source: Statistics New Zealand

Table 17. Proportion of all South Island children aged 0–14 years who were living in crowded households by Territorial Local Authority, New Zealand at the 2013 census

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

Source: Statistics New Zealand

Distribution by DHB

At the 2013 census, the proportion of all children and young people who were living in crowded households varied by DHB, with rates ranging from 6.2% in South Canterbury to 30.4% in Counties Manukau (**Table 18**). Care should be taken when interpreting these differences however, as the rates presented have not been adjusted for underlying differences in each DHB's demographic profile.

Table 18. Numbers and proportions of all children 0–14 years who were living in crowded households by District Health Board, New Zealand at the 2013 census

DHB	Number of children	Percent of children	Rate ratio	95% CI
Children 0–14 years living in crowded households				
Northland	5,445	18.4	1.17	1.14–1.20
Waitemata	13,938	13.7	0.87	0.86–0.89
Auckland	16,206	22.3	1.41	1.39–1.43
Counties Manukau	31,563	30.4	1.93	1.91–1.95
Waikato	10,470	14.5	0.92	0.90–0.94
Bay of Plenty	5,997	14.8	0.94	0.92–0.96
Lakes	3,423	17.0	1.08	1.05–1.11
Tairawhiti	2,304	23.6	1.50	1.44–1.55
Taranaki	1,953	9.1	0.57	0.55–0.60
Hawke's Bay	5,106	16.9	1.07	1.04–1.10
MidCentral	3,495	11.4	0.72	0.70–0.75
Whanganui	1,617	14.0	0.89	0.85–0.93
Hutt Valley	4,065	15.0	0.95	0.92–0.98
Capital & Coast	6,045	12.2	0.77	0.75–0.79
Wairarapa	693	9.1	0.58	0.54–0.62
Nelson Marlborough	1,938	7.9	0.50	0.48–0.52
South Canterbury	591	6.2	0.39	0.37–0.43
Canterbury	8,010	9.5	0.60	0.59–0.62
West Coast	420	7.8	0.50	0.45–0.54
Southern	3,333	6.6	0.42	0.40–0.43
New Zealand	126,600	15.8	1.00	

Source: Statistics New Zealand

EDUCATION KNOWLEDGE AND SKILLS

EARLY CHILDHOOD EDUCATION

Introduction

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

Background

Early childhood development has a significant influence on later life chances and health, and investing in the early years is one of the most effective ways to reduce health inequities due to the social determinants of health [2].

Targeted investment in evidence-based education, prevention and treatment programmes directed towards at-risk children and their families has a high rate of social and economic return. Programmes that address the needs of parents and children at the same time appear to be particularly effective [73]. Early childhood education (ECE) for disadvantaged children has been associated cognitive gains in mathematics and reading and improved learning dispositions (e.g. perseverance, confidence, getting along with others) [74], as well as with health benefits in later life such as a lower prevalence of risk factors for cardiovascular and metabolic diseases [75,76].

In New Zealand, ECE is provided by parent-led and teacher-led services including Nga Kohanga Reo, Playcentres, Playgroups, Kindergartens and centre or home-based Education and Care services. Regional Health Schools provide teachers to children in hospital, or who are at home and unable to attend ECE because of illness [77]. The Education Review Office's 2012 evaluation *Partnership with Whānau Māori in Early Childhood Services* found that most ECE services need to improve considerably in the ways they work with whānau Māori and to move beyond building relationships to establishing culturally responsive partnerships with Māori children and their whānau [78]. Participation rates in early childhood education (ECE) need to continue to increase to be on track to reach the Government target of 98% of children starting school with prior participation in quality early childhood education by 2016 [79]

Data Source and Methods

Indicators

1. Number of enrolments in licensed early childhood education services
Numerator: Total number of enrolments in licensed early childhood education services
Denominator: Not applicable (see notes below)
2. Proportion of new entrants who had previously attended early childhood education
Numerator: The number of new entrants reporting participation in ECE prior to attending school
Denominator: The number of new entrants enrolled

Data Source

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

Notes on Interpretation:

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

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

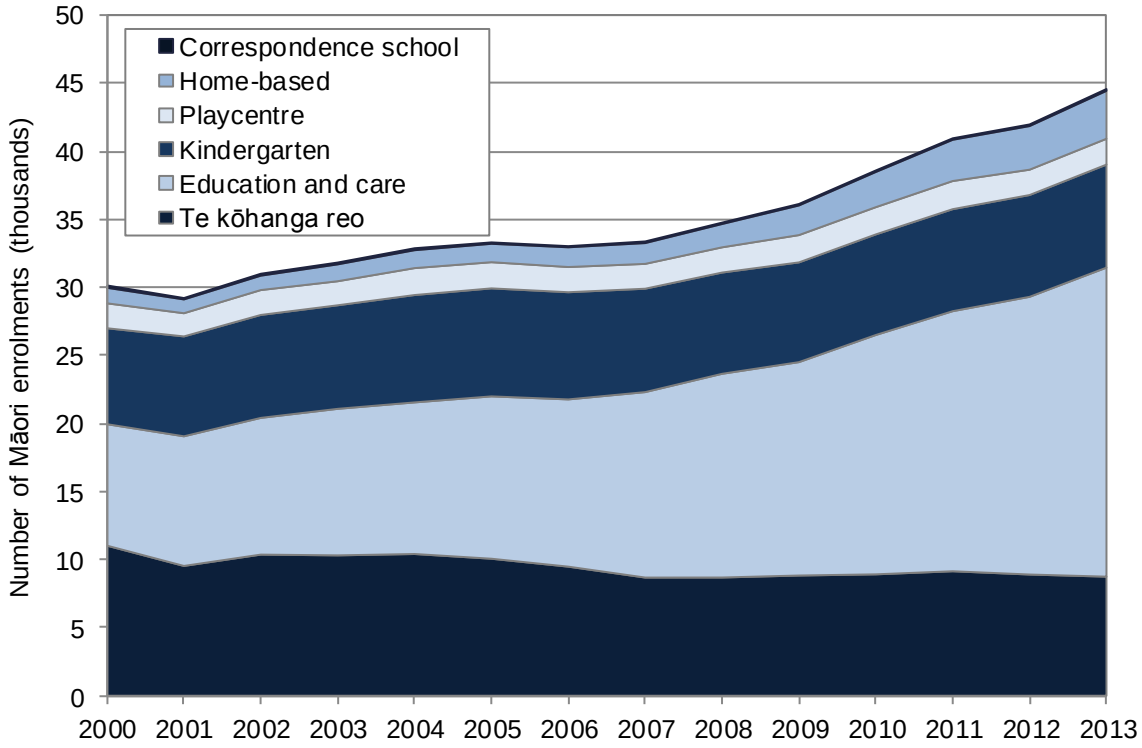
Enrolments in Early Childhood Education

New Zealand distribution and trends

Trends by service type

In New Zealand from 2000 to 2013, the number of enrolments of Māori children in early childhood education increased by 48%. Changes varied markedly by service type, with enrolments in Home Based Networks increasing by 209% and enrolments in Education and Care increasing by 154%. In contrast, enrolments in Te Kōhanga Reo decreased by 21%, and enrolments in Kindergarten increased only slightly (7.4%), as did enrolments in Playcentre (3.7%) (**Figure 44**).

Figure 44. Number of enrolments of Māori children in licensed Early Childhood Education services by service type, New Zealand year ended June 2000–2013



Source: Ministry of Education

Prior participation in Early Childhood Education

New Zealand distribution and trends

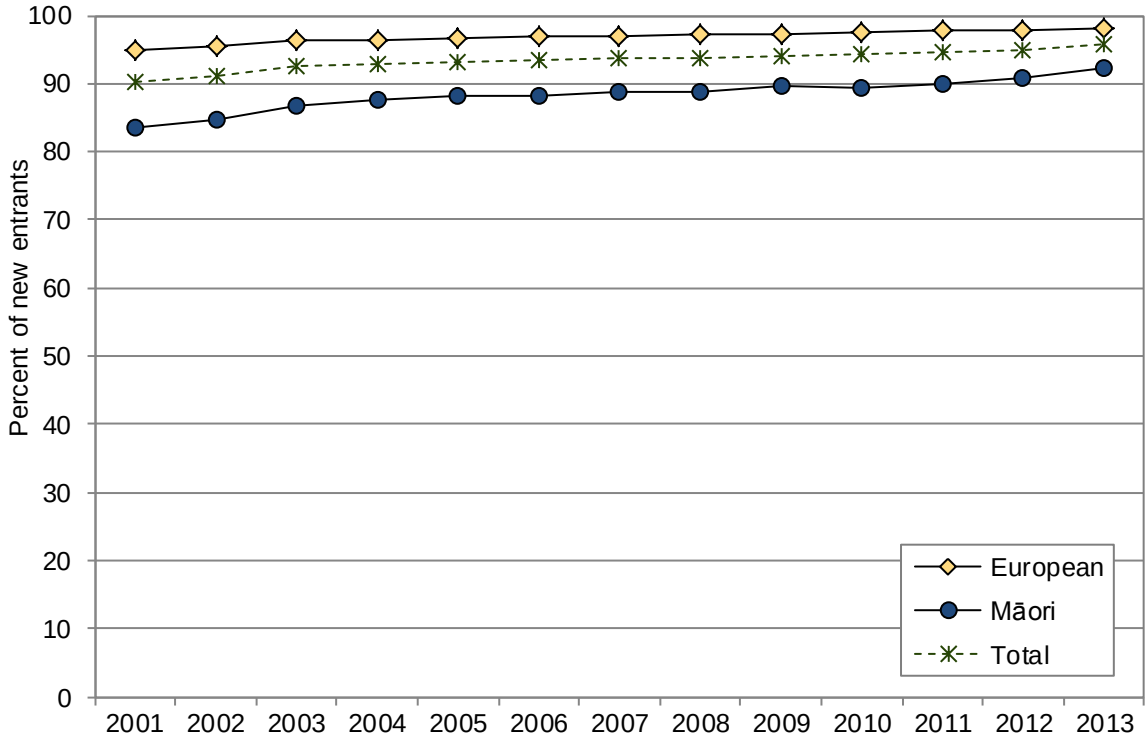
Distribution by ethnicity

In New Zealand, the proportion of Māori new entrants reporting participation in ECE prior to school entry increased, from 83.6% in 2001 to 96.3% in 2013. During this period the participation gap between Māori and European children decreased (**Figure 45**).

Distribution by school socioeconomic decile and ethnicity

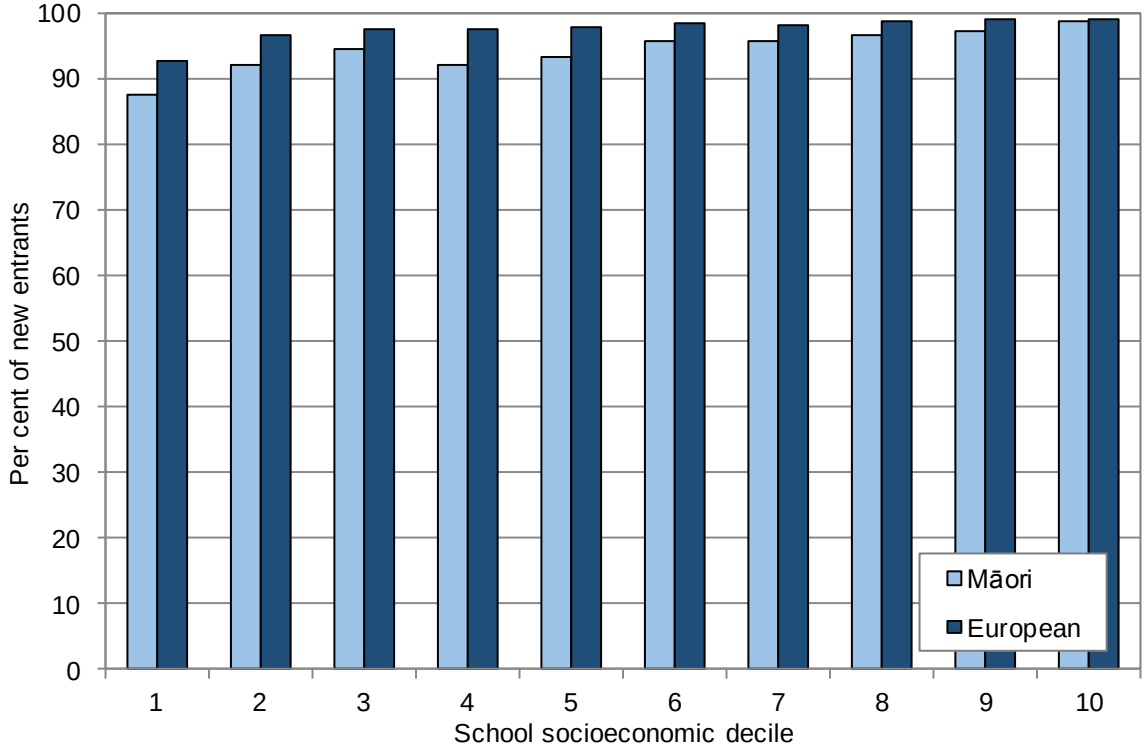
In New Zealand during 2013, 12.5% of Māori children attending schools in the most deprived areas (decile 1) had not attended ECE prior to school entry, as compared to only 1.2% of Māori children attending schools in the least deprived areas (decile 10). At all levels of deprivation, the proportion of Māori new entrants who had previously attended early childhood education was lower than the proportion of European children. The difference was greatest in the most deprived areas (87.5% of Māori new entrants vs. 92.7% of European new entrants) and least in the least deprived areas (98.8% of Māori new entrants vs. 99.1% of European new entrants) (**Figure 46**).

Figure 45. Proportion of new entrants who had previously attended Early Childhood Education by ethnicity, New Zealand 2001–2013



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

Figure 46. Proportion of new entrants who had previously attended Early Childhood Education by school socioeconomic decile and ethnicity, New Zealand June 2013



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 DHB

In New Zealand during 2013, the proportion of Māori new entrants reporting participation in ECE prior to school entry varied by DHB, with rates ranging from 86.5% in Counties Manukau to 97.6% in MidCentral (**Table 19**). Care should be taken when interpreting these differences as the rates presented have not been adjusted for underlying differences in each DHB's demographic profile.

Table 19. Proportion of new entrants who had previously attended early childhood education by Ethnicity and DHB, New Zealand 2013

District Health Board	Māori	European	Total
Prior Participation in Early Childhood Education (%)			
Northland	91.5	98.4	96.5
Waitemata	93.9	98.9	97.1
Auckland	88.4	98.5	94.8
Counties Manukau	86.5	97.6	90.3
Waikato	92.6	98.0	95.9
Bay of Plenty	92.5	98.3	95.5
Lakes	91.9	97.1	94.5
Tairawhiti	93.3	96.7	94.3
Taranaki	90.2	97.4	95.5
Hawke's Bay	93.5	97.8	96.0
MidCentral	97.6	98.4	97.9
Whanganui	93.5	96.6	95.3
Hutt Valley	95.2	98.3	97.0
Capital & Coast	95.5	99.1	97.6
Wairarapa	96.2	97.3	96.8
Nelson Marlborough	95.4	98.0	97.5
South Canterbury	95.7	98.1	98.0
Canterbury	96.1	98.7	98.0
West Coast	90.0	94.5	93.9
Southern DHB	96.2	98.2	97.9
New Zealand	92.3	98.2	95.6

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

MĀORI MEDIUM EDUCATION

Introduction

The following section uses Ministry of Education data to review the number of students enrolled in Māori Medium Education during 2002–2013.

Background

Māori language, custom, land, marae, whānau and community networks all contribute to a secure cultural identity, which is positively linked to health status, educational achievement and emotional and social adjustment [80]. Te Reo Māori (the Māori language) is an official language of New Zealand and the Ministry of Education has a lead role with other government agencies to work with Māori towards achieving the goal of all Māori and other New Zealanders having access to high quality Māori language education [81].

Māori medium education provides an alternative learning pathway for students to learn through Te Reo Māori from early childhood education through to tertiary education. The sector has its origins in the Kōhanga Reo movement in the early 1980s, and was driven initially by Māori who saw the need to address the failure of the education system to be responsive to Māori learners. Māori medium education enables learning experiences that reflect Māori knowledge, language and cultural values. It is delivered in New Zealand through bilingual (English/Te Reo Māori) classes, Te Reo Māori immersion classes, Ngā Kōhanga Reo early childhood education services, and Kura Kaupapa Māori schools. The three levels of Kura Kaupapa Māori schools within the New Zealand education system are Kura Tuatahi (delivering education from Years 1 to 8 as contributing primary, full-primary or intermediate schools); Kura Arongatahi (delivering education from Year 1 to 13 (as composite schools); and Wharekura (delivering education to Years 9 to 13) [81]. Māori students participating in Māori medium secondary education have been more likely to succeed educationally than their Māori peers at English-medium schools [82].

The National Curriculum for New Zealand is composed of The New Zealand Curriculum and Te Marautanga o Aotearoa [83]. From 2011 Māori medium kura and settings have been required to implement Te Marautanga o Aotearoa (TMOA) and use the associated assessment tool Ngā Whanaketanga Rumaki Māori [84]. Personal health and development are key components of TMOA and the curriculum seeks to develop successful learners, healthy of mind, body and soul and secure in their identity and sense of belonging [85]

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 [86]. Prior to 2001, kura teina were not counted as separate schools, and after 2010 they ceased to exist.

New Zealand Distribution and Trends

Enrolments in Māori Medium Early Childhood Education

In New Zealand during 2002–2013, the number of enrolments in licensed Te Kōhanga Reo decreased slightly, from 10,389 in 2002 to 9,179 in 2013. A number of children also attended Ngā Puna Kōhungahunga and licence-exempt Te Kōhanga Reo during this period (**Table 20**).

Table 20. Enrolments in Māori Medium Early Childhood Education by Type, New Zealand 2002–2013

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

Source: Ministry of Education

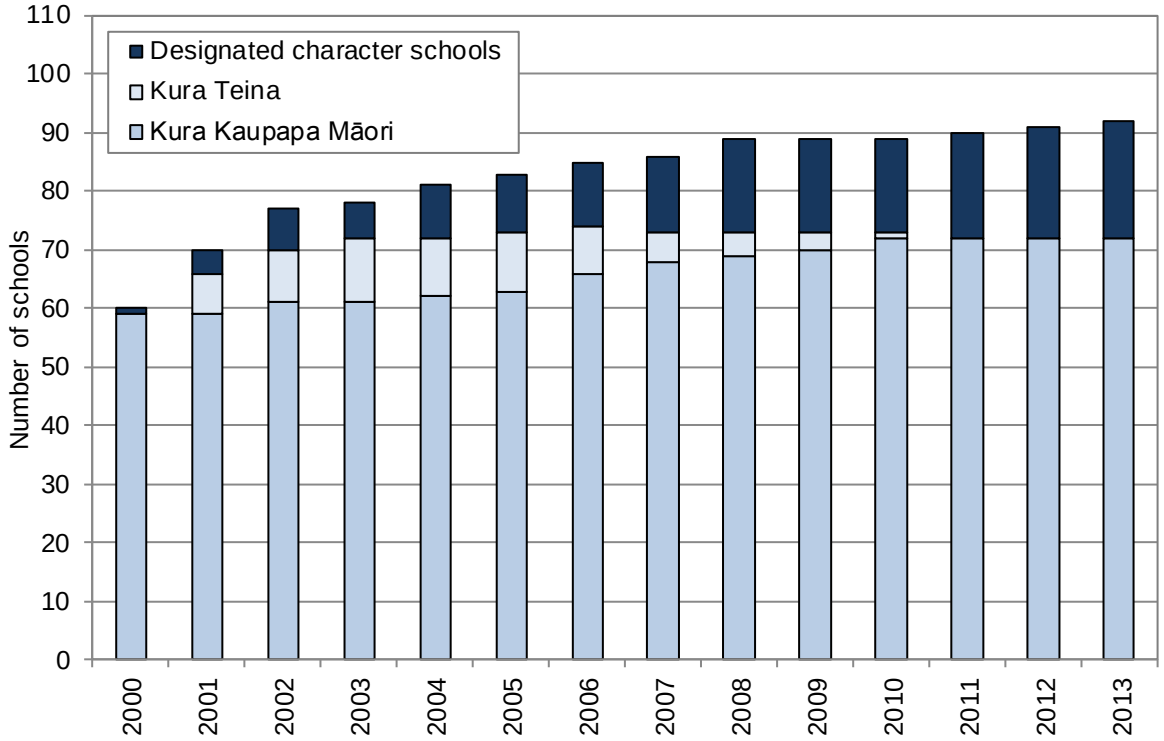
Number of Kura Kaupapa Māori and Kura Teina

The number of kura kaupapa Māori and kura teina, increased from 59 in 2000, to 72 in 2010. Since then the number has not changed. There has been steady growth in the number of designated charter schools from one in the year 2000 to 20 in 2013 (**Figure 47**).

Māori Medium Education in New Zealand

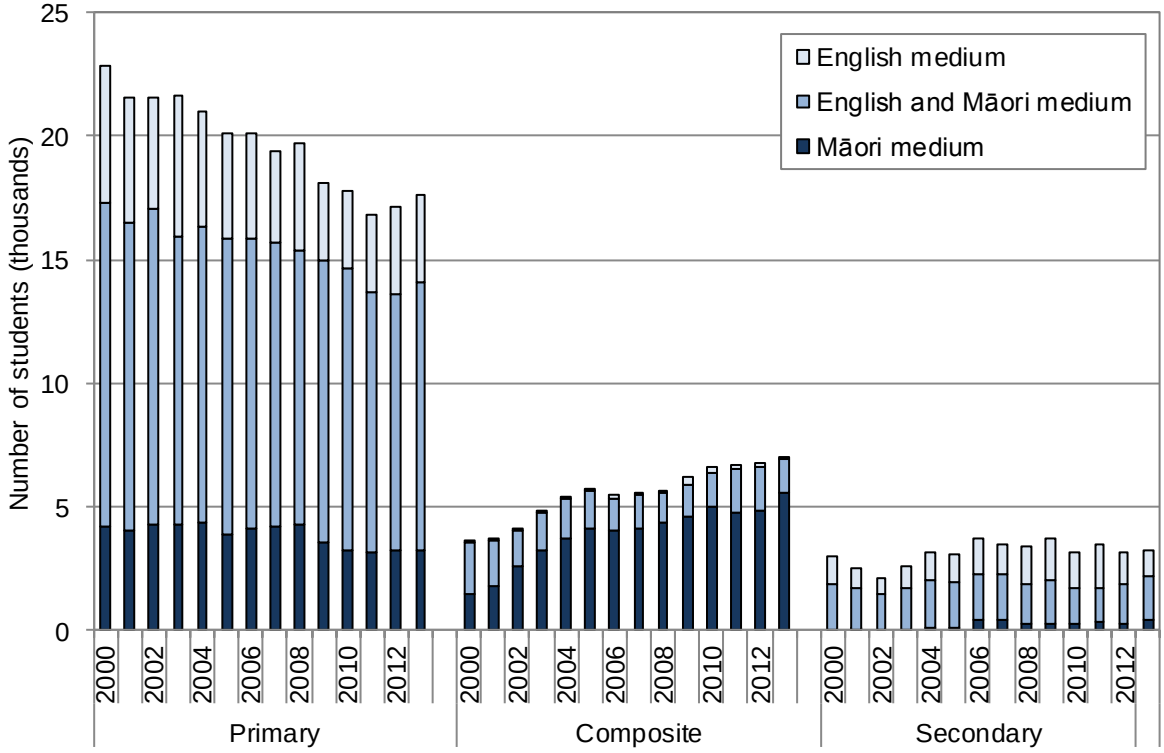
While kura kaupapa Māori offer a Māori language immersion environment, a number of other New Zealand schools offer some of their curriculum in Māori, and the degree of Māori medium learning is often categorised into 4 levels: Level 1: 81–100%; Level 2: 51–80%; Level 3: 31–50%; Level 4(a): 12–30%. Students who do not attend Kura Kaupapa Māori may therefore 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 48** and **Table 21**).

Figure 47. Number of Kura Kaupapa Māori and Kura Teina, New Zealand 2000–2013



Source: Ministry of Education; Note: Prior to 2001 Kura Teina were not counted as separate schools; Kura Teina are developing Kura that are attached to a recognised Kura Kaupapa Māori; Kura Teina ceased to exist after 2010

Figure 48. Number of Students Involved in Māori Medium Education by School Sector and Form of Education, New Zealand 2000–2013



Source: Ministry of Education, data as at 1 July each year

Table 21. Number of Students (Māori and non-Māori) Involved in Māori Medium Education by Regional Council and level of Māori language immersion, New Zealand July 2013

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

Source: Ministry of Education

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 2009–2013.

Background

In a knowledge-based society such as New Zealand, access to both tertiary education and entry level jobs requires young people to have formal school qualifications. A National Certificate of Educational Achievement (NCEA) Level 2 qualification is the desired minimum qualification for school leavers, giving them opportunities in terms of further education, employment, health outcomes and a better quality of life [87]. The New Zealand Government has set a target of 85% of 18-year-olds achieving NCEA Level 2 or an equivalent qualification in 2017; this target was met by 78.6% of 18-year-olds in 2013 [88].

The Government has identified Māori students, Pasifika students, students from low socio-economic families and students with special education needs as its priority students. Although many students from these groups achieve at high levels within education, student achievement data also show that students from these groups are over represented among those students the system has struggled to support [89].

Achieving the desired outcomes in learning relies not only on the student or the family, but also on their interactions with the education system itself. A number of systemic improvements can assist in meeting national educational priorities, including school leadership, teacher professional learning and development, and the provision of quality teaching for diverse (all) learners [90].

Data Source and Methods

Indicators

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

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

Denominator: Number of school leavers in a given year

Data Source

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

Definition

The National Certificate of Educational Achievement (NCEA) is part of the National Qualifications Framework. In 2002 all schools implemented NCEA Level 1, replacing School Certificate. In 2003 NCEA Level 2 was rolled out, however, schools were still able to offer a transitional Sixth Form Certificate Programme. From 2004 onwards, Level 3 NCEA replaced Higher School Certificate and University Entrance/University Bursaries. In 2004 the Level 4 qualification, New Zealand Scholarship, was also offered:
(http://www.educationcounts.govt.nz/indicators/definition/education-and-learning-outcomes/28879).

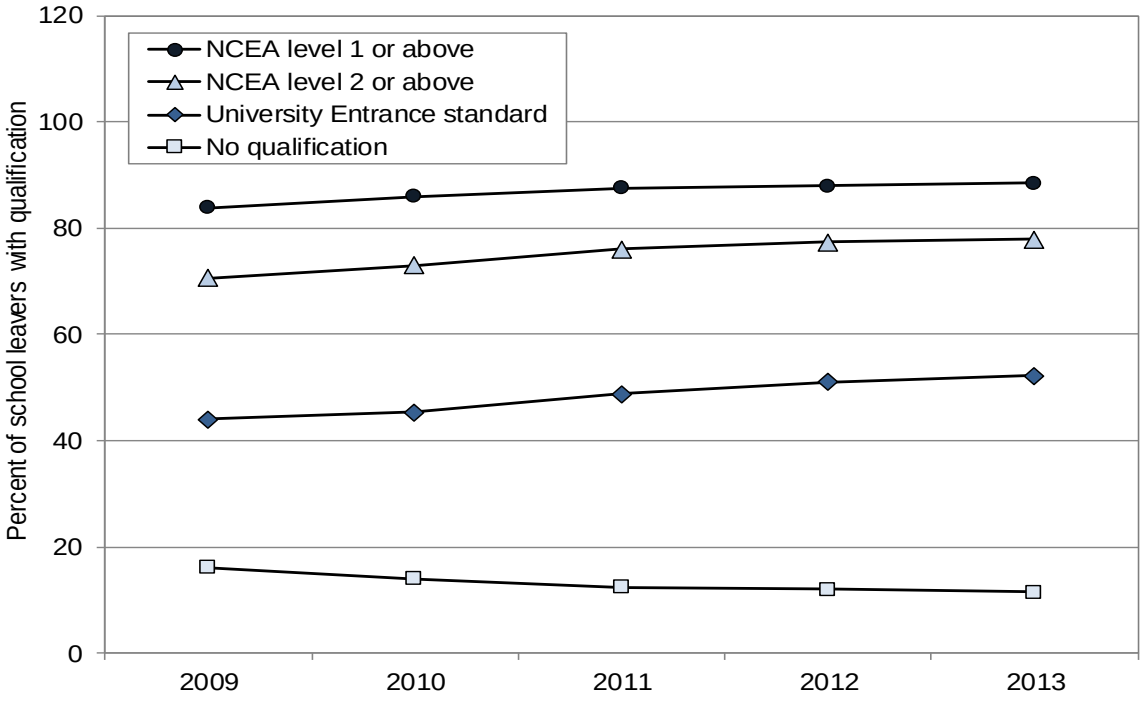
There are three levels of NCEA certificate, depending on the difficulty of the standards achieved. At each level, students must achieve a certain number of credits, with credits being able to be gained over more than one year. The requirements for each level are:

NCEA Level 1: 80 credits at any level (level 1, 2 or 3) including literacy and numeracy
NCEA Level 2: 60 credits at level 2 or above + 20 credits from any level
NCEA Level 3: 60 credits at level 3 or above + 20 credits from level 2 or above.

New Zealand Distribution and Trends

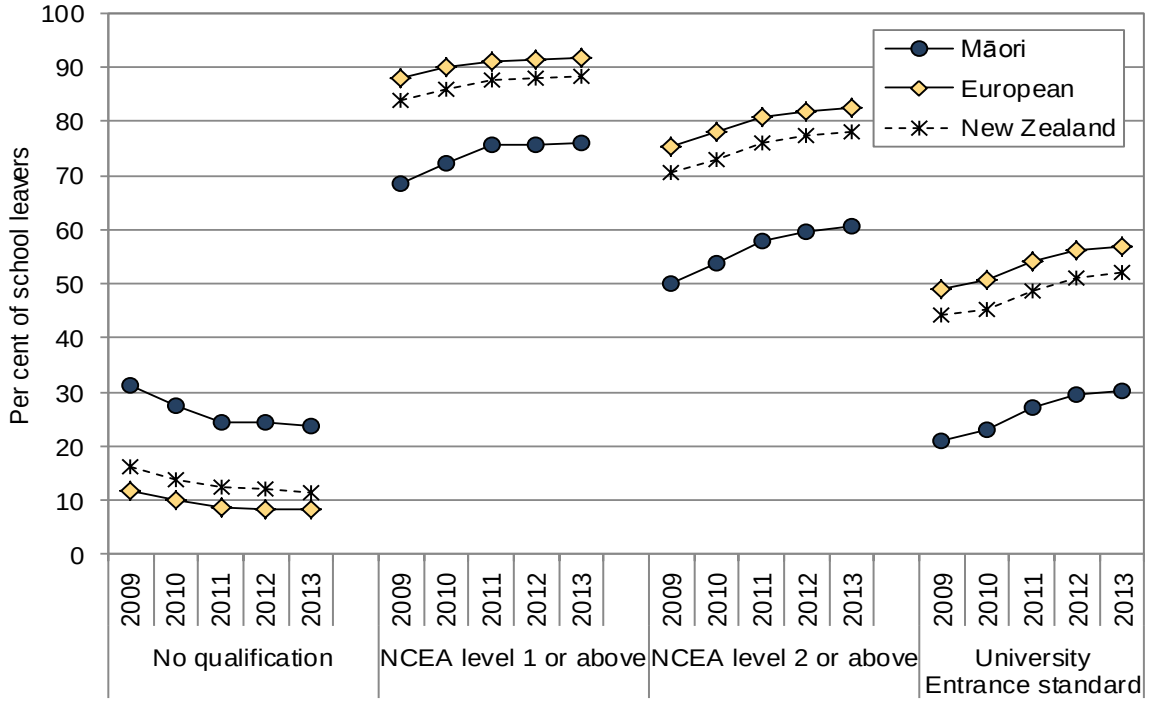
In New Zealand during 2013, 11.5% of all students left school with no formal qualifications, while 88.5% left with NCEA Level 1 or above, 78.0% left with NCEA Level 2 or above, and 52.2% attained a University Entrance standard. While the proportion of students leaving with no formal qualifications declined during 2009–2013, the proportion attaining a University Entrance standard increased (**Figure 49**).

Figure 49. Highest educational attainment of school leavers, New Zealand 2009–2013



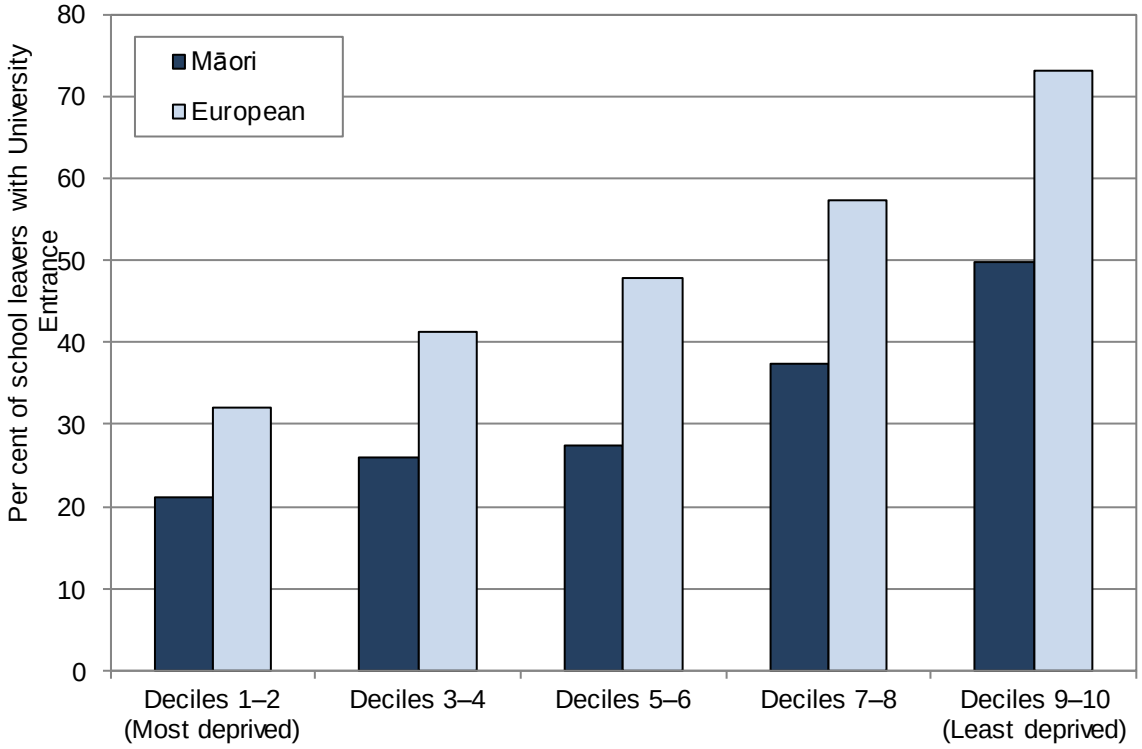
Source: Ministry of Education

Figure 50. Educational Attainment of School Leavers by Ethnicity, New Zealand 2009−2013



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

Figure 51. School Leavers with a University Entrance Standard by Ethnicity and School Socioeconomic Decile, New Zealand 2013



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

Distribution by Ethnicity

In New Zealand during 2013, 23.8% of Māori students left school with no formal qualifications, while 76.2% left with NCEA Level 1 or above, 60.7% left with NCEA Level 2 or above, and 30.3% attained a University Entrance standard. While the proportion of students leaving with no formal qualifications declined during 2009–2013, the proportion attaining a University Entrance standard increased (**Figure 50**).

Distribution by Ethnicity and School Socioeconomic Decile

In New Zealand during 2013, for both Māori and non-Māori non-Pacific students, the proportion of students achieving a University Entrance standard increased with increasing school socioeconomic decile. At each level of socioeconomic deprivation a higher proportion of non-Māori non-Pacific students than Māori students attained a University Entrance standard (**Figure 51**).

Distribution by DHB

In New Zealand during 2013, the proportion of Māori students leaving school with no formal qualifications varied by DHB, with rates ranging from 33.3% in Counties Manukau, to 15.0% in South Canterbury (**Table 22**). Similarly the proportion leaving school with a University Entrance standard ranged from 21.3% in Counties Manukau DHB to 43.0% in Auckland DHB (**Table 23**). Care should be taken when interpreting these differences, however, as the rates presented have not been adjusted for underlying differences in each DHB's demographic profile.

Table 22. Proportion of school leavers with no qualification by ethnicity and District Health Board, New Zealand 2013

District Health Board	Māori	European	Total
Proportion leaving school with no qualification (%)			
Northland	24.0	8.0	14.9
Waitemata	21.6	6.2	8.5
Auckland	17.2	4.8	8.1
Counties Manukau	33.3	9.0	14.8
Waikato	26.6	9.1	14.5
Bay of Plenty	25.0	7.0	12.5
Lakes	23.7	11.1	16.7
Tairawhiti	20.6	11.2	16.2
Taranaki	21.9	8.1	11.0
Hawke's Bay	20.9	8.0	12.0
MidCentral	21.1	9.7	12.3
Whanganui	21.4	8.9	12.2
Hutt Valley	24.0	10.8	12.8
Capital & Coast	16.2	4.9	7.3
Wairarapa	21.2	8.0	11.3
Nelson Marlborough	21.2	10.2	11.8
South Canterbury	15.0	8.1	8.6
Canterbury	27.1	10.1	11.8
West Coast	23.3	11.6	13.3
Southern	20.4	8.3	9.6
New Zealand	23.8	8.2	11.5

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

Table 23. 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	28.0	52.9	43.0
Waitemata	37.4	62.8	60.8
Auckland	43.0	77.0	66.1
Counties Manukau	21.3	54.2	47.3
Waikato	27.2	50.6	44.3
Bay of Plenty	29.8	56.1	48.2
Lakes	29.5	52.7	43.6
Tairawhiti	34.9	58.2	43.8
Taranaki	25.0	48.4	44.2
Hawke's Bay	31.9	59.3	50.6
MidCentral	30.4	49.8	45.5
Whanganui	33.5	59.3	51.2
Hutt Valley	28.6	54.9	49.0
Capital & Coast	37.1	68.1	61.2
Wairarapa	24.8	51.7	46.2
Nelson Marlborough	28.0	52.5	49.0
South Canterbury	30.0	52.7	50.6
Canterbury	28.9	53.7	52.0
West Coast	23.3	34.0	32.7
Southern	33.9	51.8	50.2
New Zealand	30.3	57.0	52.2

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

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 and also tertiary participation rates.

Background

To achieve at secondary school, students need to be at school, experience a sense of belonging, and stay interested and engaged in learning. There is a strong correlation between early school leaving and unemployment and/or lower incomes. School attendance is legally required in New Zealand until a child is aged 16 years. However parents of students aged 15 years are able to apply to the Ministry of Education for an exemption on the basis of educational problems, conduct, or the unlikelihood that a student will obtain benefit from attending school. Since the Ministry of Education strengthened its early leaving application and approval process in 2007, the number of applications for early leaving exemptions has dropped sevenfold from around 70 applications per 1,000 15-year-old students in 2006 to around 10 applications per 1,000 15-year-old students in 2013. [91].

The scope of the tertiary education sector ranges from informal non-assessed community courses through to undergraduate degrees and advanced, research-based postgraduate degrees. Over recent years there have been improvements in participation and achievement at higher levels in tertiary education for Māori students with an increase in the proportion of Māori students studying at level 4 or higher (on the New Zealand Qualifications Framework) and an increase in the number of Māori students studying at bachelor's level or higher. Despite this, there is still a gap in participation and achievement between Māori and the rest of the population [92]. The Government's Māori education strategy *Ka Hikitea – Accelerating Success 2013–2017* states that raising educational achievement is the single most important way to raise living standards through a more productive and competitive economy [92].

Data Source and Methods

Indicators

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

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

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

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

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

Denominator: The 2013 New Zealand population age distribution

Data Source

Ministry of Education

Notes on Interpretation

Retention

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

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

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

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

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

Age standardised participation rates

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

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

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

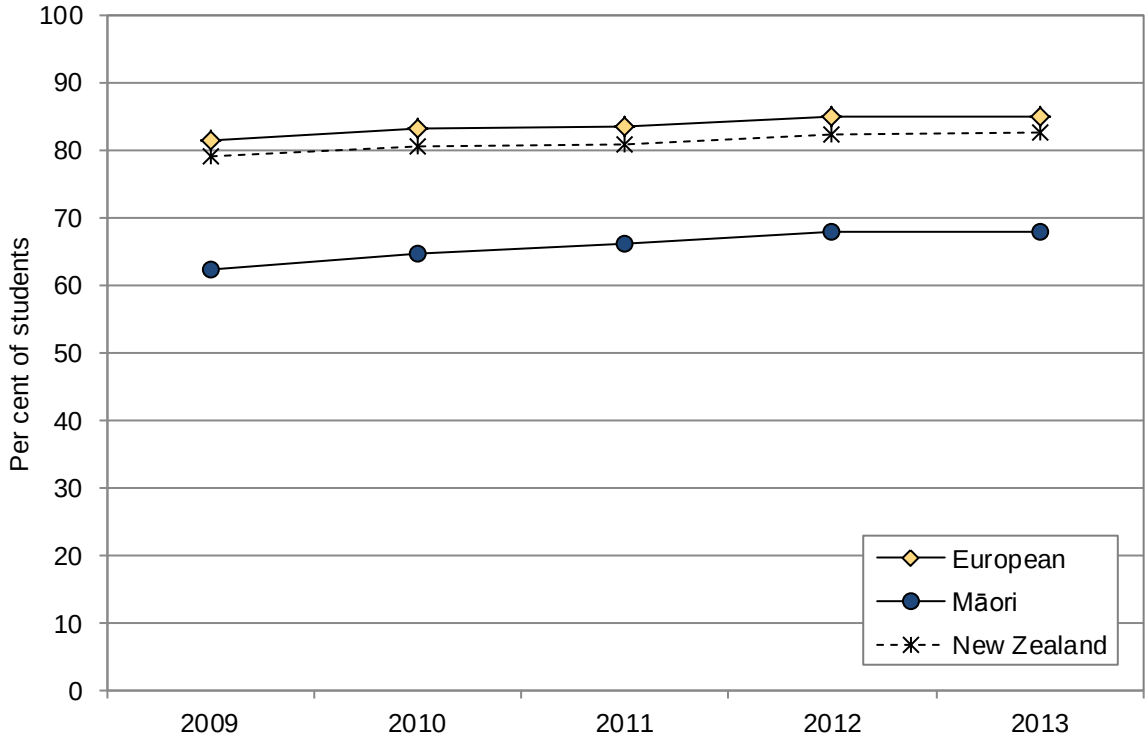
New Zealand Distribution and Trends

Senior Secondary School Retention

Distribution by Ethnicity

In New Zealand from 2009 to 2013, the proportion of Māori students who stayed on at school until at least 17 years of age increased slightly. In 2013, 67.9% of Māori students stayed on at school until at least 17 years of age, as compared to 85.1% of European, students (**Figure 52**).

Figure 52. 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

Distribution by District Health Board

The proportion of Māori secondary school students who stayed on at school until at least 17 years varied between DHBs, ranging from 66.6% in Northland DHB to 78.7% in Capital and Coast DHB (**Table 24**).

Table 24. Proportion of secondary school students staying on at school until at least 17 years of age by ethnicity and District Health Board, New Zealand 2013

District Health Board	Māori	European	Total
Retention at secondary school to 17 years per 100 students			
Northland	66.6	85.4	77.5
Waitemata	72.7	88.1	87.2
Auckland	77.6	92.0	89.9
Counties Manukau	60.8	84.0	81.8
Waikato	68.6	83.2	79.8
Bay of Plenty	67.6	85.4	80.1
Lakes	64.6	80.3	74.5
Tairawhiti	73.7	86.2	78.8
Taranaki	74.1	82.9	81.3
Hawke's Bay	69.9	85.8	81.3
MidCentral	74.0	83.3	82.5
Whanganui	76.2	84.4	82.4
Hutt Valley	73.4	89.5	87.1
Capital & Coast	78.7	90.4	89.7
Wairarapa	75.2	85.3	83.1
Nelson Marlborough	76.8	85.0	83.9
South Canterbury	78.3	83.1	82.9
Canterbury	69.1	83.6	83.3
West Coast	73.3	76.9	76.7
Southern	75.0	85.9	85.1
New Zealand	67.9	85.1	82.6

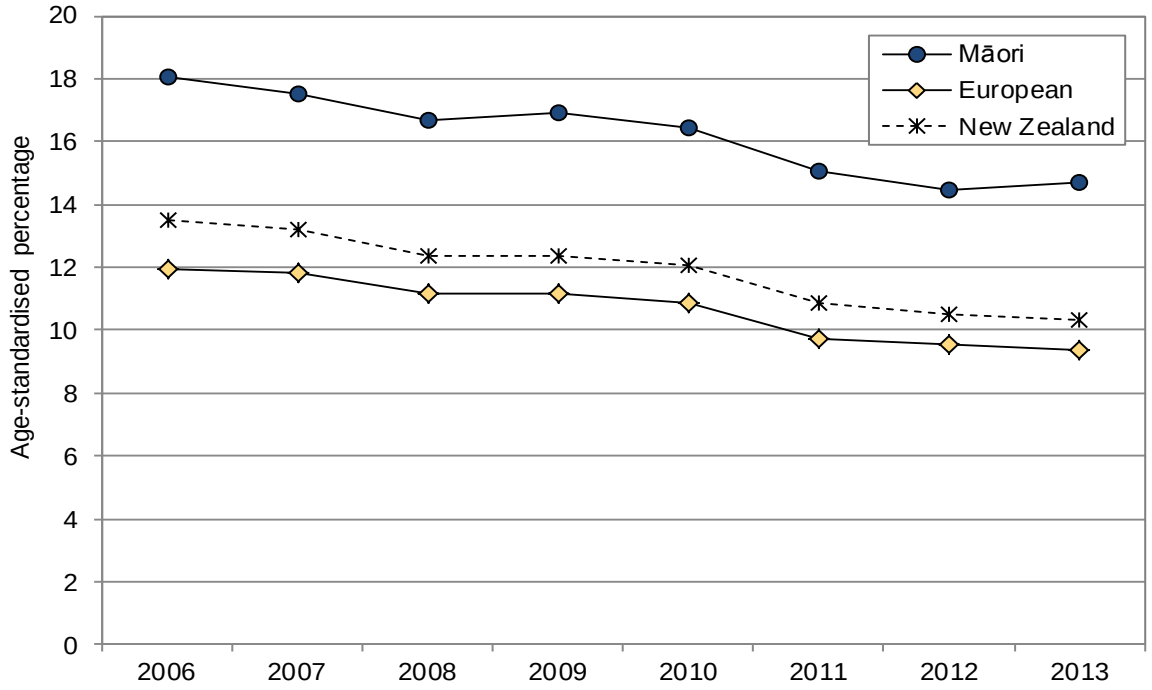
Source: Ministry of Education. Note: Ethnicity is Total Response and thus individual students may appear in more than one ethnic group

Participation in Tertiary Education

Distribution by Ethnicity

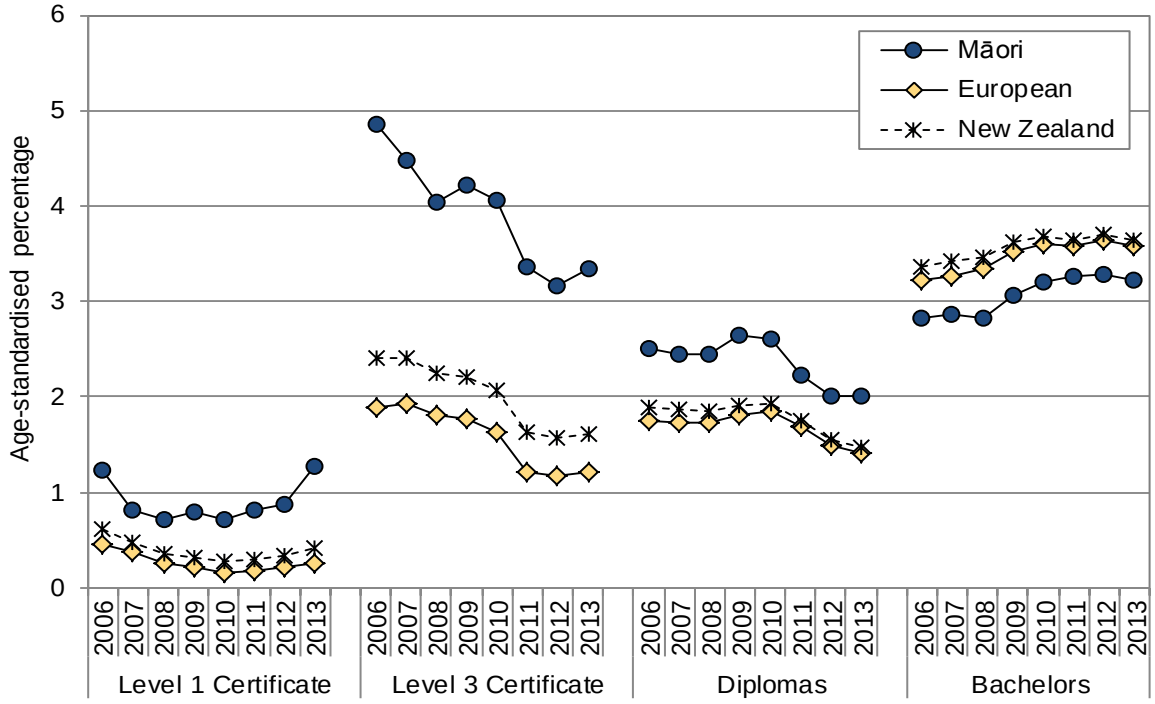
Ethnic differences in school retention rates at 17 years need to be viewed in the context of the alternative educational opportunities available to students. During 2001–2013, a large number of students participated in tertiary education, with Māori having the highest participation rates (**Figure 53**). Māori students had high participation rates for Certificate Level 1–3 courses but their participation rates for courses leading Bachelor's level qualifications were lower than for Europeans (**Figure 54**). While tertiary participation rates also include those 25+ years, these figures suggest that for many, participation in formal education does not cease at school leaving. The income premiums achieved for completing various types of study need to be taken into consideration when assessing the longer term impacts educational participation has on economic security.

Figure 53. Age-standardised participation rates in tertiary education for domestic students by ethnicity, New Zealand 2006–2013



Source: Ministry of Education; Note: Tertiary education includes Level 1–4 Certificates, Diplomas, Bachelors, Level 7 Graduate Certificates/Diplomas, Level 8 Honours/Postgraduate Certificates/Diplomas, Masters, and Doctorates. Ethnicity is total response and thus individual students may appear in more than one ethnic group.

Figure 54. Age-standardised participation rates in tertiary education for domestic students by ethnicity and selected qualification, New Zealand 2006–2013



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

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 2000–2013.

Background

Stand-downs, suspensions, exclusions and expulsions are ways that schools respond to a wide range of concerning behaviours, including drug and alcohol abuse and violence, which could disrupt the learning of the individuals concerned and be disruptive and unsafe for peers and adults in the school community. Schools vary in their responses to behaviour: what one school may choose to suspend for, another may not. If it used as an opportunity to reduce tension and allow a student to reflect on the action which led to the stand-down, a stand-down can be a positive mechanism for preventing escalation as part of a proactive approach. However, students who have been excluded or expelled may face difficulties in enrolling in other schools and so have to access correspondence schooling, Alternative Education provision (for excluded students) or tertiary education, or they may drop out of the education system entirely [93].

While for the majority of students a stand-down or suspension is a one-off event, with the time spent away from school being fairly limited (e.g. a few days or weeks), for some students the concerning behaviour is part of a persistent conduct problem. New Zealand and overseas research has found that conduct problems are associated with poorer long term outcomes, including educational underachievement (e.g. leaving school early and without qualifications), unemployment and occupational instability during young adulthood [94]. Improved student engagement is an important contributing factor in improving student achievement (see chapter on **Highest Educational Attainment at School Leaving**). Age-standardised stand-down rates have fallen in New Zealand for seven consecutive years, and in 2013 age-standardised stand-down, suspension, and exclusion rates were at their lowest in 14 years of recorded data, which may signal improved student engagement [93].

Data Source and Methods

Indicator

1. *Number of stand-downs, suspensions, exclusions and expulsions per 1,000 students enrolled*
Numerator: Total number of stand-downs, suspensions, exclusions and expulsions, per year of age

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

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

Data Source
Ministry of Education

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

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

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

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

Exclusions and Expulsions: If a student is under 16 years, the Board of Trustees may decide to exclude them from the school, with the requirement that they enrol elsewhere. This decision is arrived at only in the

most serious cases. If the student is aged 16 or over, the Board may decide to expel them from the school, and the student may enrol at another school. Exclusions and expulsions may lead to difficulties being accepted into other schools and may result in students accessing correspondence schooling, entering alternative education or dropping out of the education system altogether.

Notes on Interpretation

Note 1: Data were obtained from the Ministry of Education's Stand-down and Suspension database, which was developed in 1999, after the introduction of the Education (Suspension) Rules 1999. Rates were calculated by dividing the number of stand-downs, suspensions, exclusions or expulsions per individual year of age during the school year by the number of students on the school roll at July 1st, per individual year of age. All figures were then age standardised by the Ministry of Education, so that all subgroups in all years had the same age structure. In this process, the expected number of stand-downs, suspensions, exclusions and expulsions were calculated by looking at the age-dependence of each outcome nationally over each year, and then applying this to the age structure and population of respective schools. The age-standardised rate for each DHB was calculated by multiplying the 2011 national rate by the ratio of observed to expected outcomes for each DHB. As such, the standardised rate is an artificial measure, but does provide an estimate of how groups might compare over time if they had the same age distribution [95].

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.

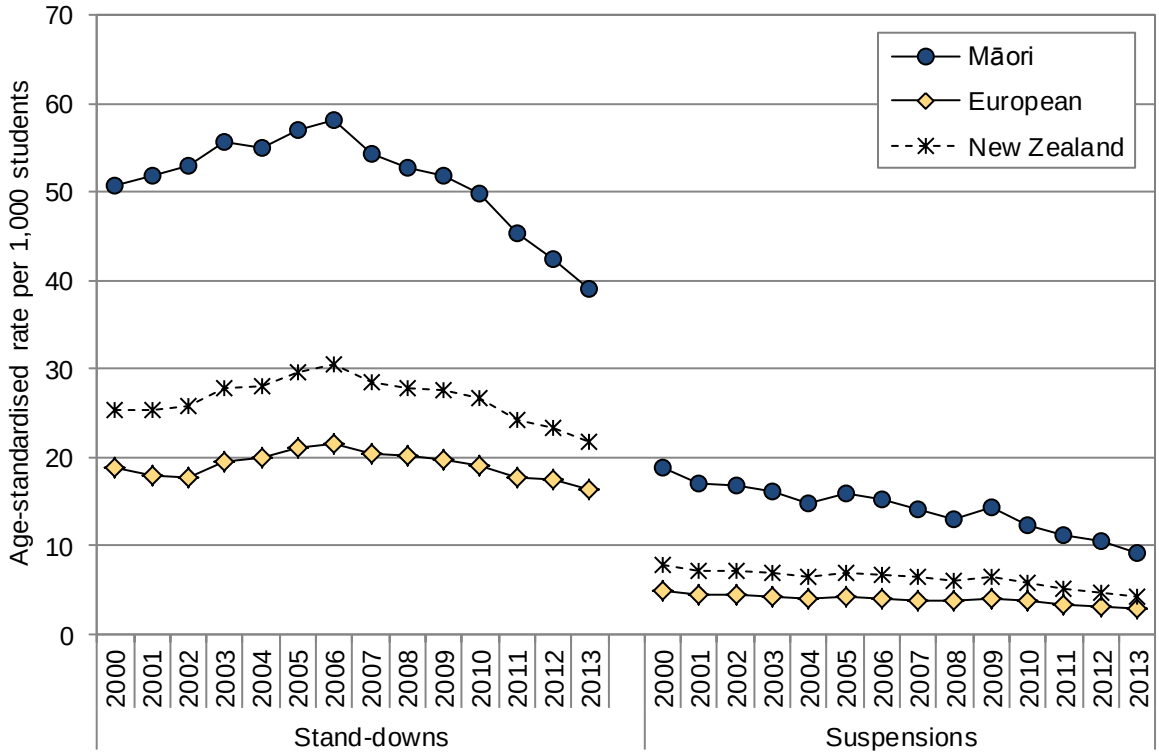
Note 3: Ethnicity is level 1 prioritised (i.e. one ethnic group per student)

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. Although rates throughout 2000–2011 were higher for Māori than for European students, the rate of decline for Māori students has been greater since 2006. Suspension rates for Māori students declined throughout 2000–13, with rates falling from 18.8 per 1,000 in 2000, to 9.1 per 1,000 in 2013. Suspension rates were higher for Māori than for European students throughout this period, (**Figure 55**).

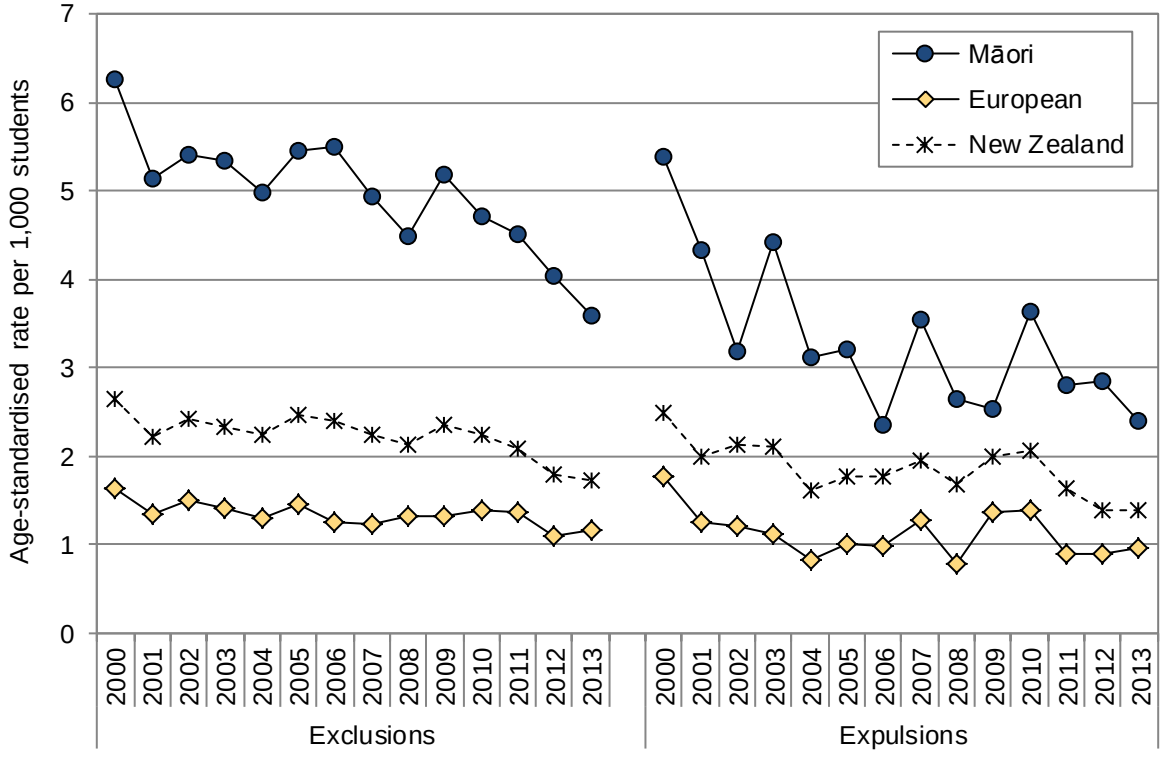
Exclusions and Expulsions: In New Zealand during 2000–2013, exclusion and expulsion rates for Māori students both exhibited a general downward trend, with exclusion rates falling from 6.3 per 1,000 in 2000, to 3.6 per 1,000 in 2013. Similarly, expulsion rates fell from 5.4 per 1,000 in 2000, to 2.4 per 1,000 in 2013. Throughout this period, exclusion and expulsion rates were higher for Māori than for European students (**Figure 56**).

Figure 55. Age-standardised rates of stand-downs and suspensions by ethnicity, New Zealand 2000–2013



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

Figure 56. Age-standardised rates of exclusions and expulsions by ethnicity, New Zealand 2000–2013



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

Suspensions by Ethnicity and DHB

In New Zealand during 2013, suspension rates for Māori students varied by DHB, with rates ranging from 5.8 per 1,000 in Southern to 14.5 per 1,000 in Waikato (**Table 24**).

Table 25. Age-standardised school suspension Rates by Ethnicity and District Health Board, New Zealand 2013

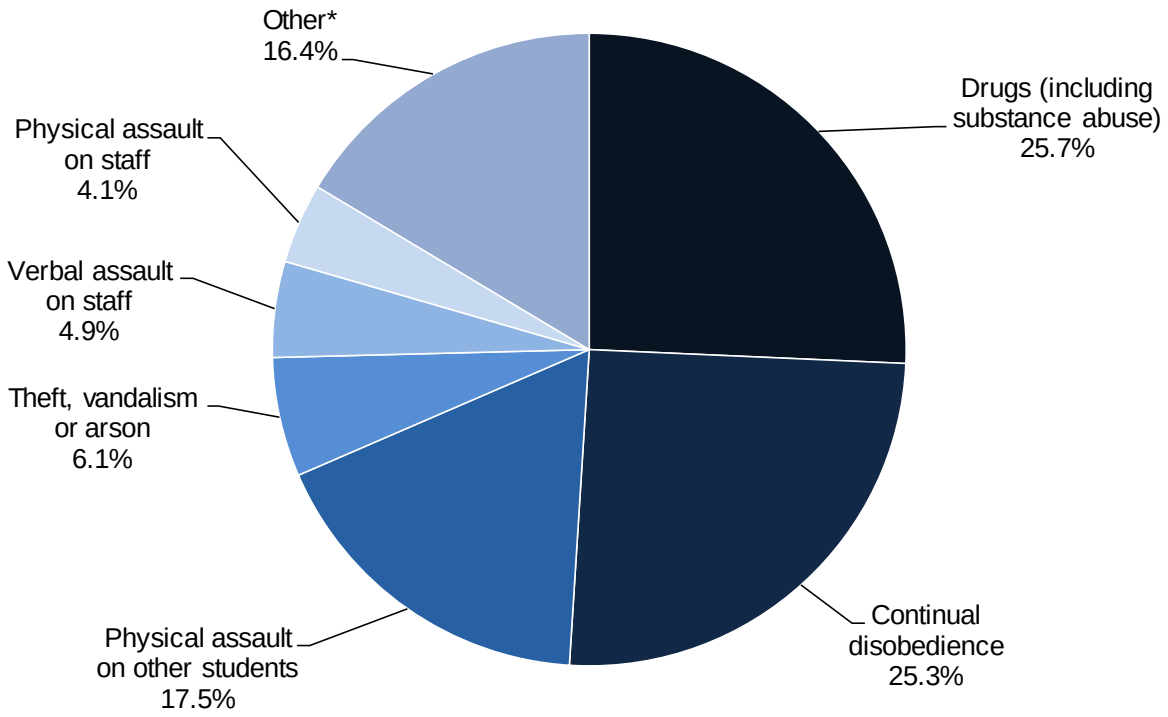
District Health Board	Māori	European	Total
Age-standardised suspension rate per 1,000 students			
Northland	11.6	1.7	7.0
Waitemata	7.3	2.4	2.7
Auckland	6.4	2.1	3.2
Counties Manukau	7.9	3.1	3.8
Waikato	14.5	3.5	7.1
Bay of Plenty	8.2	1.8	4.2
Lakes	9.9	3.4	6.7
Hawke's Bay	9.8	3.6	5.8
Tairawhiti	7.6	2.9	5.8
Taranaki	8.9	2.6	4.2
MidCentral	7.0	4.4	5.2
Whanganui	9.8	3.3	5.8
Hutt Valley	6.1	2.0	3.1
Capital & Coast	6.1	1.3	2.6
Wairarapa	12.0	6.4	7.6
Nelson Marlborough	10.3	3.2	4.3
South Canterbury	10.5	4.7	5.2
Canterbury	7.2	3.6	3.9
West Coast	11.4	2.9	4.4
Southern	5.8	3.0	3.4
New Zealand	9.1	2.9	4.3

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

Suspensions by Behaviour

For all New Zealand students' suspensions during 2013, the most common reasons for a suspension were the misuse of drugs or other substances (25.7%), continual disobedience (25.3%), or a physical assault on other students (17.5%), which together accounted for 68.5% of all suspensions. Verbal assaults on staff and theft also made a smaller contribution (**Figure 57**).

Figure 57. Distribution of suspensions by type of behaviour, New Zealand 2013



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

TRUANCY AND UNJUSTIFIED ABSENCES

Introduction

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.

Background

Student attendance, along with effective teaching, is vital for student engagement and achievement. Student attendance is one of the most significant variables influencing educational achievement in senior secondary school [96]. In New Zealand, parents are required by law to make sure that their child goes to school each day and parents and carers of children between six and 16 years old can be prosecuted if their child is away from school without a good reason [97].

Irregular attendance may be an early indicator of problems with student motivation or teaching effectiveness. Students who are truant or, more precisely, are unjustifiably absent from class have an increased risk of alienation from the education system [96]. If a student misses five school days each term, or one day a fortnight, they will miss the equivalent of one year of school over 10 years. As the level of absenteeism grows, the difficulty of re-engaging in learning can grow exponentially [98]. Longitudinal studies in Dunedin and Christchurch suggest that truancy is a strong predictor of substance abuse, suicidal risk, unemployment, early parenting and violence in later life [94,99].

Interventions to reduce unauthorised absence can be enhanced by increasing the focus on primary school absence and parental attitudes, integrating attendance issues into wider, positive communications with pupils, parents and carers, effective systems to monitor attendance, and adapting curricula to better match pupils' aptitudes and aspirations [100].

Data Source and Methods

Indicators

1. *Total unjustified absence rate*

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

Denominator: Total number of enrolled students in participating schools

2. *Frequent truancy rate*

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

Denominator: Total number of enrolled students in participating schools

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

Data Source

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

Definitions

Absences were classified using the following definitions.

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

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

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

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

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

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

Notes on Interpretation

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

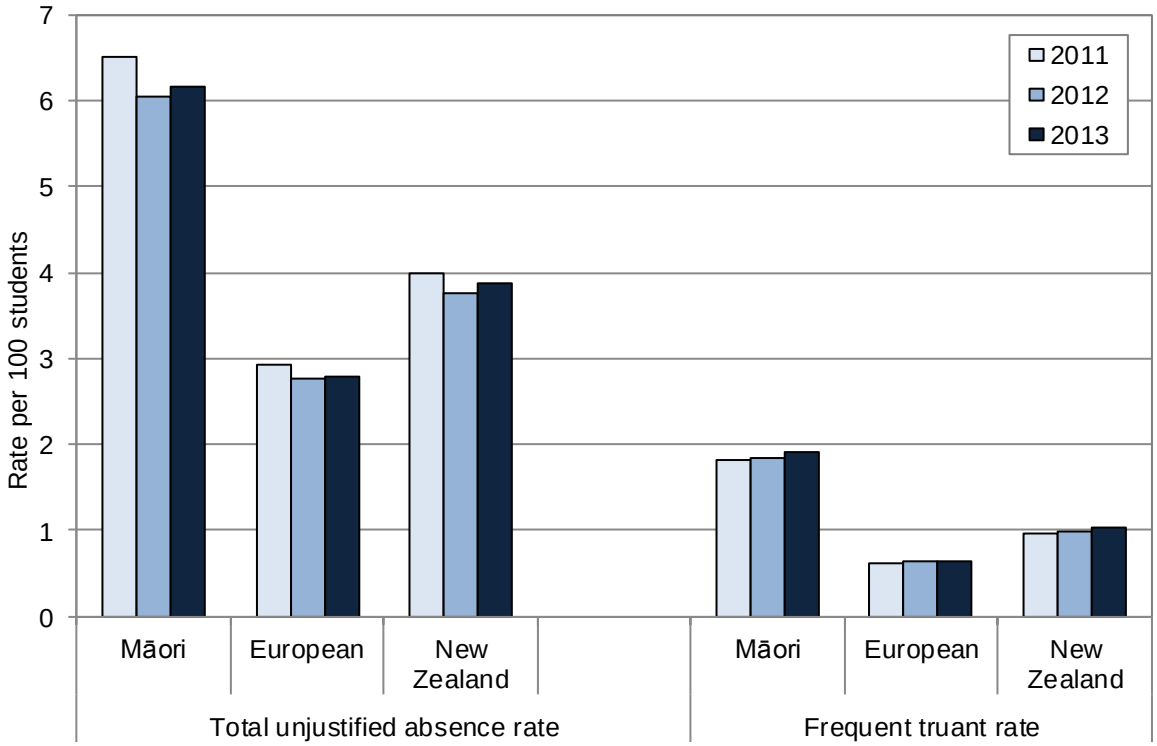
Note 2: Since 2009, the survey has utilised two forms of data collection. Schools that use a module in their Student Management Systems (SMS) to enter their attendance records electronically were asked to provide an extract from the eAR. Schools that do not use eAR were invited to take part in the paper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

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

Distribution by Ethnicity

In New Zealand, during 2011–2013 the total unjustified absence rates in Māori students were around 6 per 100 students, while frequent truancy rates were in the range 1.8 to 1.9 per 100 students. Total unjustified absence and frequent truancy rates were higher for Māori than for European students during this period (**Figure 58**).

Figure 58. Total unjustified absences and frequent truancy by ethnicity, New Zealand 2011–2013



Source: Ministry of Education. Note: Ethnicity is prioritised

Distribution by Ethnicity and DHB

In New Zealand during 2013, total unjustified absences in Māori students varied by DHB, with rates ranging from 3.0 per week per 100 students in South Canterbury, to 9.2 per week per 100 students in Northland. Frequent truancy ranged from 0.8 per 100 students in South Canterbury, to 3.3 per 100 students in Northland (**Table 26**).

Table 26. Total unjustified absences by ethnicity and District Health Board, New Zealand 2013 Ministry of Education Attendance Survey

District Health Board	Māori	European	Total	Māori	European	Total
	Total unjustified absence rate			Frequent truancy		
Northland	9.2	4.2	6.7	3.3	0.8	2.1
Waitemata	5.0	2.3	2.9	1.7	0.7	0.9
Auckland	5.9	1.9	3.6	1.8	0.5	1.0
Counties Manukau	8.0	2.8	5.0	2.6	0.5	1.3
Waikato	6.0	3.4	4.3	1.7	0.7	1.1
Bay of Plenty	6.4	3.2	4.4	1.9	0.5	1.0
Lakes	5.9	3.4	4.7	2.1	0.7	1.4
Tairawhiti	8.0	3.6	6.4	2.4	0.9	1.8
Taranaki	5.5	3.1	3.7	1.5	1.0	1.1
Hawke's Bay	5.4	1.8	3.3	1.7	0.5	1.0
MidCentral	3.7	1.9	2.5	0.9	0.5	0.6
Whanganui	5.5	2.8	3.8	2.0	0.6	1.2
Hutt Valley	4.8	2.6	3.2	1.2	0.4	0.6
Capital & Coast	5.3	2.6	3.2	1.8	0.5	0.8
Wairarapa	6.3	3.8	4.5	2.0	1.2	1.4
Nelson Marlborough	4.6	2.7	3.0	1.2	0.7	0.8
South Canterbury	3.0	2.2	2.3	0.8	0.5	0.5
Canterbury	6.1	3.6	4.2	1.3	0.7	0.9
West Coast	7.8	4.1	4.9	2.7	1.3	1.7
Southern	4.3	2.9	3.2	1.2	0.7	0.8
New Zealand	6.2	2.8	3.9	1.9	0.6	1.0

Source: Ministry of Education. Note: Ethnicity is prioritised.

RISK AND PROTECTIVE FACTORS

WELL CHILD SERVICES

INTRODUCTION TO WELL CHILD TAMARIKI ORA SERVICES

All New Zealand families and whānau are entitled to the Well Child/Tamariki Ora (WCTO) programme, a package of free health services for children from birth to the age of five years [101]. Most children receive WCTO services from Plunket, but some receive WCTO services from Māori and Pacific non-governmental agencies, DHB-funded providers, or primary health organisations [102].

The services all children are entitled to receive are set out in the Well Child/Tamariki Ora Schedule (on the Ministry of Health website), which describes the surveillance, education and support services that are delivered across a total of 12 core contacts [103]. As well as these 12 core contacts, the Schedule also includes a general practitioner check at six weeks of age, linked to the six-week immunisations, to ensure babies are connected to primary health services. High needs children and families may be allocated additional contacts on the basis of need [103]. The WCTO Schedule divides services into three parallel streams, to be delivered as an integrated package of care. The streams are: health and development assessments, care and support for families and whānau, and health education.

The present WCTO framework is the result of an extensive review of the previous framework, involving consultation with key stakeholders and a literature review. The review led to WCTO services having a greater focus on social and emotional developmental stages (in addition to physical developmental stages), a greater emphasis on psychosocial factors that can affect children's wellbeing, more proactive approaches to promotion of attachment and prevention of behavioural problems, and an increased focus on identification of, and response to, individual family and whānau needs [104]. In addition, the present framework: includes evidence-based assessment tools to support care planning; encourages better coordination between WCTO practitioners/providers, lead maternity carers, general practice, specialist health services, and education and social services; promotes better use of information collected antenatally to improve postnatal care; and has an increased focus on monitoring and quality improvement.

The following sections review the immunisation coverage of children, the number of visits received by new babies enrolled with Plunket, and children participating in the B4 School Check.

IMMUNISATION COVERAGE

Introduction

The following section provides a brief overview of New Zealand's current immunisation schedule, along with a summary of recent changes.

Background

Immunisation is the process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine [105]. Vaccines mimic disease-causing micro-organisms and stimulate the body's immune system to produce T-lymphocytes and antibodies which provide protection against future encounters with these viruses or bacteria and thus prevent disease [106]. When a high proportion of a population is protected against a particular disease-causing virus or bacterium it is difficult for the associated disease to spread through the population because there are so few susceptible people left to infect. In such a population even non-vaccinated individuals receive a measure of protection. This phenomenon is known as "herd immunity" [107].

The 20th Century saw dramatic declines in vaccine-preventable diseases worldwide and vaccination has been identified as a cost-efficient means of reducing inequities in health [108,109]. Since 2005, the National Immunisation Register has provided data for monitoring immunisation coverage in New Zealand [110]. Immunisation rates have improved in recent years [111]. In the second quarter of the 2013/14 primary health care targets, 92% of eight month olds enrolled in a PHO were fully immunised [112] compared to 2005–2007 when 85% of all eligible children were fully immunised at 12 months [113]. Further increases in immunisation rates are likely to be beneficial; for instance, measles is considered to be eradicable if immunisation rates exceed 95% [114].

Immunisation uptake has been lower in populations living in more deprived areas in New Zealand, as is the case in other countries [113]. The "deprivation gradient" in immunisation rates has also been more pronounced for Māori and Pacific children [113]. Increasing immunisation coverage and timeliness continues to be a Ministry of Health target. The current target is that by December 2014, 95 percent of eight-months-olds will have had their primary course of immunisation (six weeks, three months and five months immunisation events) [115].

New Zealand's Current Immunisation Schedule

The New Zealand Immunisation Schedule offers publicly funded vaccination for eleven vaccine preventable diseases: diphtheria, tetanus, pertussis, poliomyelitis, hepatitis B, *Haemophilus influenzae* type b, measles, mumps, rubella, pneumococcal disease and rotavirus, to children aged between six weeks and 11 years (**Table 27**) [116]. Human papillomavirus (HPV) vaccination is offered to girls aged 12 years. Additional publicly funded vaccinations for hepatitis A, influenza, meningococcal A, C, W135 and Y, varicella (chickenpox), and tuberculosis (BCG vaccination) are offered to those at risk.

Table 27. 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/*Haemophilus influenzae* type b	1 injection (INFANRIX–hexa®)
	13-valent pneumococcal conjugate	1 injection (Prevenar 13®)
	Pentavalent rotavirus vaccine (an oral vaccine)	1 dose RotaTeq®
3 months	Diphtheria/tetanus/acellular pertussis/inactivated polio vaccine/hepatitis B/*Haemophilus influenzae* type b	1 injection (INFANRIX -hexa®)
	13-valent pneumococcal conjugate	1 injection (Prevenar 13®)
	Pentavalent rotavirus vaccine (an oral vaccine)	1 dose RotaTeq®
5 months	Diphtheria/tetanus/acellular pertussis/inactivated polio vaccine/hepatitis B/*Haemophilus influenzae* type b	1 injection (INFANRIX-hexa®)
	13-valent pneumococcal conjugate	1 injection (Prevenar 13®)
	Pentavalent rotavirus vaccine (oral vaccine)	1 dose RotaTeq®
15 months	*Haemophilus influenzae* type b	1 injection (Act-HIB®)
	measles/mumps/rubella	1 injection (M-M-R ll®)
	13-valent pneumococcal conjugate	1 injection (Prevenar 13®)
4 years	Diphtheria/tetanus/acellular pertussis/inactivated polio vaccine	1 injection (INFANRIX-IPV®)
	Measles/mumps/rubella	1 injection (M-M-R ll ®)
11 years	Diphtheria/tetanus/acellular pertussis	1 injection (BOOSTRIX®)
12 years girls only	Human papillomavirus	3 injections given over 6 months (GARDASIL®)

Source: Ministry of Health, New Zealand Immunisation Schedule [116]

The Ministry of Health has recently published a new Immunisation Schedule that details the changes made to timing or type of immunisation [116,117]. All children transfer to the new Schedule from 1 July 2014. The rotavirus vaccine and the 13-valent pneumococcal vaccine are new additions. The text box below provides a brief overview of these two additions.

Recent changes to the New Zealand Immunisation Schedule

Rotavirus vaccination has been added to the schedule from 1 July 2014. Rotavirus is ubiquitous in the community and all children are likely to be infected before the age of five years. Rotavirus infection causes gastroenteritis (diarrhoea and vomiting). The resulting dehydration can lead to infants being admitted to hospital. The peak incidence of rotavirus gastroenteritis is between 6 and 24 months of age [118]. The rotavirus vaccine used in New Zealand, RotaTeq®, is a live oral vaccine containing five human-bovine rotavirus reassortants: G1, G2, G3, G4 and P1A [112,118].

The 2012 Cochrane review assessing vaccines for preventing rotavirus diarrhoea reported on 12 RCTs of RotaTeq® [119]. It found that in children aged less than one year living in countries with low mortality rates, RotaTeq® probably prevented 87% of severe rotavirus diarrhoea cases (relative risk 0.13, 95% CI 0.04–0.45). This finding was based on moderate quality evidence from three trials with a total of 2344 participants. One trial from Finland, with 1029 participants, provided low quality evidence that the vaccine may prevent 72% of severe all-cause diarrhoea cases: (RR 0.28, 95% CI 0.16–0.48). Three other trials conducted in low-mortality countries, with a total of 3190 participants, reported on severe rotavirus diarrhoea in the two years after vaccination. These trials provided moderate quality evidence that RotaTeq® probably prevented 82% of severe rotavirus diarrhoea cases (RR 0.18, 95% CI 0.07–0.50). In addition, the trial from Finland provided low quality evidence that, in the two years after vaccination, the vaccine may prevent 96% of all-cause severe diarrhoea: (RR 0.04, 95% CI 0.00–0.70).There was no evidence that the vaccine affected mortality rates, but since death from rotavirus infection is very rare in developed countries, the trials were underpowered to detect an effect on this end point. Following vaccination with RotaTeq® there were adverse events reported in 1884 out of 78,226 children. Thirty-four cases of intussusception were reported in 81,459 children. (Intussusception is a serious adverse event which involves part of the intestine being pulled in on itself. This can result in blockage of the intestine and loss of blood supply to part of the intestine causing it to die.) There was no significant difference in intussusception rates between children receiving RotaTeq®, Rotarix (the other vaccine brand) and placebo.

Since 2006, many countries have included rotavirus vaccination in their vaccination schedules. Studies in high income countries have found that, following the instruction of the pentavalent vaccine, there was a 89–100% reduction in rotavirus emergency department visits or hospitalisations in children under five years of age [120]. A study which investigated rates of intussusception following the introduction of rotavirus vaccination in Australia, where both brands of the vaccine are use in different states, found a statistically significantly increased risk of intussusception in the seven days after the first, and to a lesser extent, the second, vaccine doses. The magnitude increased risk was similar for both vaccines. The study authors estimated that the introduction of the vaccine had resulted in 14 extra cases of intussusception and more than 6,500 fewer gastroenteritis hospitalisations in young children in Australia each year [121].

The 13-valent pneumococcal vaccine (Prevenar 13®, PCV13) replaced the 10-valent vaccine for all children in July 2014 [116]. The first pneumococcal vaccine in the immunisation schedule was Prevnar-7® (PCV7), introduced in June 2008. It was replaced by the 10-valent vaccine Synflorix® in July 2011. Invasive pneumococcal disease (IPD) has been notifiable since 2008 and notification data is reported on by the ESR [122].

The latest ESR report indicates that the rate of IPD in infants under two years of age has decreased by 64% since the introduction of PCV7 from an average incidence of 100.3 cases per 100,000 population per year in 2006/07 to 35.9 per 100,000 per year in 2012. Cases of IPD caused by PCV7 serotypes in 0–2 year olds decreased by 98%, from an average of 83.1 per 100,000 in 2006/2007 to 1.6 per 100,000 in 2012. There were also significant reduction in both all IPD and PCV7 IPD cases in the 2–4 years age group. Rates of PCV7 IPD, but not all-cause IPD, decreased in the 5–64 years and the 65+ years age-groups indicating a herd immunity effect. Rates of IPD for Māori have been about 3 times, and for Pacific peoples about 4 times the European rate. Since 2009, in the <2 years age group, IPD rates have decreased significantly for Māori, decreased, but not significantly, for Europeans and increased, but not significantly, for Pacific peoples. Reductions in incidence of both all IPD and IPD due to the pneumococcal serotypes that are additional in the PCV13 vaccine have been reported in the U.S., the U.K, Denmark , Germany, Greece and Spain [123]. A study of admission rates for all lower respiratory infections in Counties Manukau following the introduction of PCV7 in June 2008 found that pneumonia admissions in children <2 years decreased significantly after the introduction of the vaccine (incidence risk ratio (IRR) 1.51; 95% CI 1.08–1.77), additional to the gradual decline that had been occurring since 2001. There was significant decline for Pacific children (IRR 1.70; 95% CI 1.39–2.07) but not for Māori children (IRR 1.05; 95% CI 0.78–1.40) [124].

Immunisation Coverage Rates

The following section uses the National Immunisation Register to review immunisation coverage rates for children at 6, 8, 12, 18, and 24 months, and 5 years of age.

Data Source and Methods

Indicator

Proportion of children fully immunised at 6, 8, 12, 18, and 24 months, and 5 years of age

Numerator: National Immunisation Register (NIR): The number of children who turned the milestone age during the reporting period and who had completed their age appropriate immunisations by the time they turned that milestone age.

Denominator: NIR: The number of children who turned the milestone age during the reporting period.

Notes on Interpretation

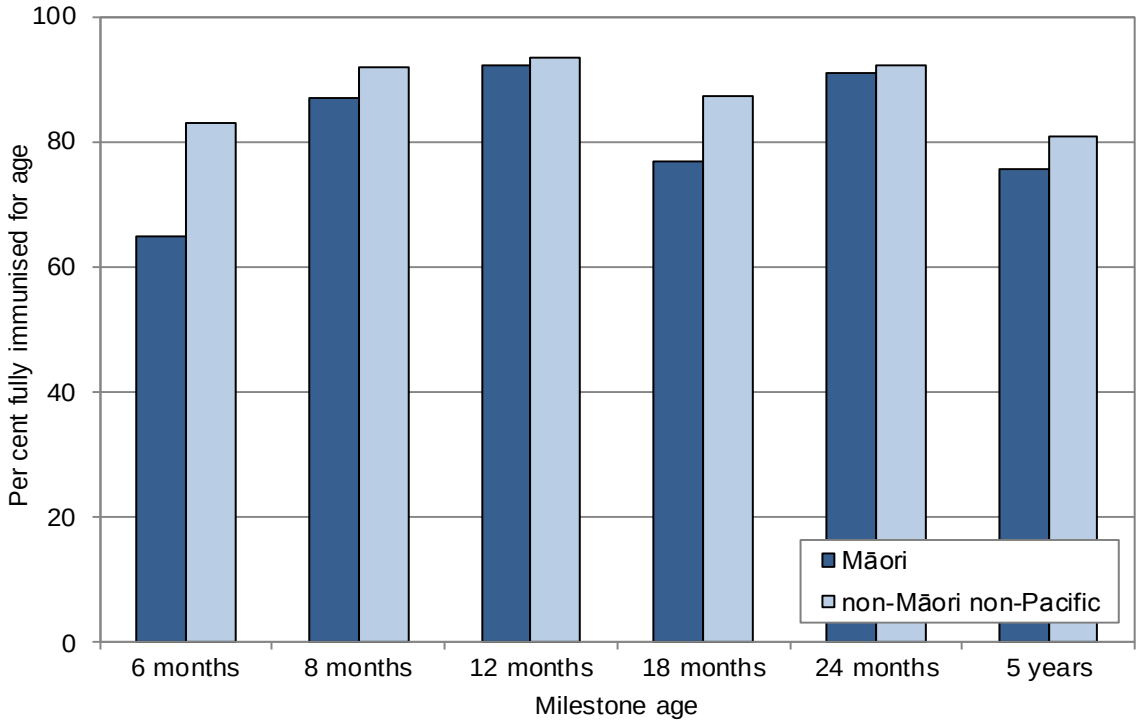
During pregnancy and after birth, parents are informed about the NIR, with Lead Maternity Carers playing a key role in information provision. Following delivery, all of the relevant information about each child is added to the NIR, with parents being able to 'opt off' having their child's immunisation information stored in the NIR. In this case the child's National Health Index number, date of birth, District Health Board and any immunisations already recorded in the NIR are retained, so that immunisation coverage can be accurately calculated. Parents may also choose not to immunise their children and this is recorded on the NIR as a declined immunisation event to prevent recalls.

The NIR was implemented by the Ministry of Health and District Health Boards in 2005. The rollout occurred in a staged fashion commencing with the Greater Auckland region in April 2005 and finishing in Nelson Marlborough in December 2005. Thus only children born from 2005 onwards have their details recorded in the NIR. However, all children immunised with the MeNZB vaccine as part 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 Milestone Age and Ethnicity

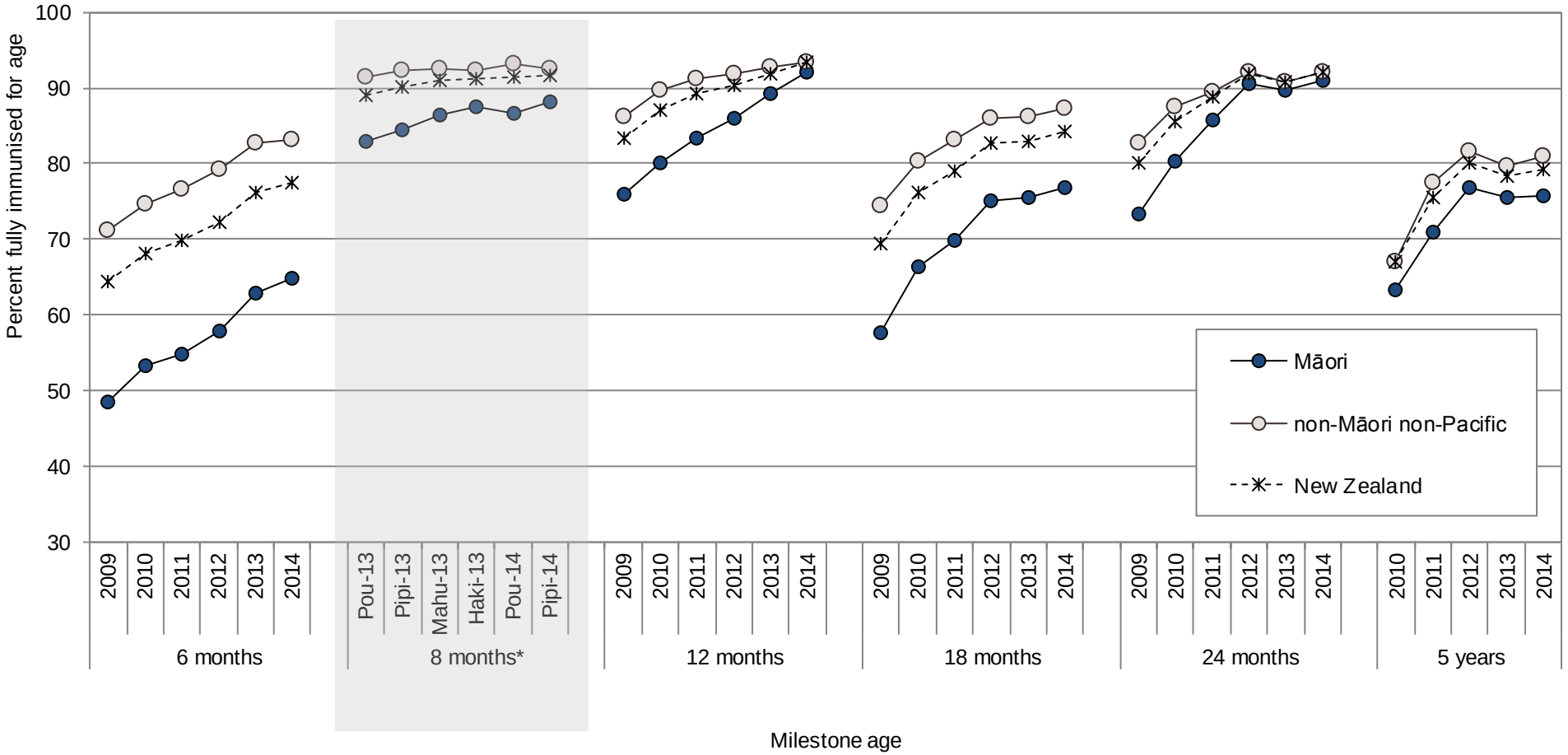
In New Zealand, for the year ending 30 June 2014, immunisation coverage rates for Māori children varied with age, being lowest at six months (64.8%) and highest at 12 months (92.1%) (**Figure 59**). Māori rates were lower than non-Māori non-Pacific rates at all ages but the difference was small (around 1 percentage point) at ages 12 and 24 months. Over the period 2009–2014, immunisation rates for Māori children increased for all ages (**Figure 60**).

Figure 59. Immunisation coverage by milestone age and ethnicity New Zealand, year ended 30 June 2014



Source: National Immunisation Register

Figure 60. Immunisation coverage by milestone age and ethnicity, New Zealand years ended June 2009–2014



Source: National Immunisation Register

PLUNKET CHILDREN RECEIVING CORE WELL CHILD CONTACTS

Introduction

The following section uses the Plunket data to assess the number of contacts Plunket has provided to Māori children enrolled with Plunket before one year of age during July 2005–June 2013.

Background

Plunket is one of the Well Child/Tamariki Ora (WCTO) providers contracted by the Ministry of Health to provide Well Child services to newborn babies, and preschool children.

A number of contractual changes have occurred in Plunket's provision of WCTO services over the years. Between 2002 and 2012, Plunket was contracted to deliver a minimum of seven core contacts at specified age bands along with additional services such as contact via telephone. In 2007, the 8th core contact was excluded from the Plunket contract and became the B4School Check subsequent to a review of the WCTO Framework. In October 2012, flexibility increased with respect to the age at which core contacts could occur. For example, the first three contacts could occur between the ages of 2 weeks–15 weeks and 6 days and up to 5% of the Core 4–7 contacts could occur in the next age band (**Table 28**). In 2013, Plunket was contracted to deliver an average of six core contacts and an equivalent number of additional contacts. These additions can include joint face-to-face visits and joint care planning.

In addition to the WCTO visits, Plunket provides support to families through PlunketLine and Facebook Chats, as well as services such as parenting education, support groups, car seat schemes and safety schemes. Plunket also has a number of contracts with some of the DHB's to provide services to clients.

Table 28. The age bands used by Plunket for the core Well Child/Tamariki Ora

Contact	Well Child/Tamariki Ora age	Plunket age band (pre 2012)	Plunket age band (post 2012)
Core 1	4–6 weeks	2 weeks–5 weeks 6 days	3 contacts between ages: 2 weeks–15 weeks 6 days
Core 2	8–10 weeks	6 weeks–9 weeks 6 days	
Core 3	3–4 months	10 weeks–15 weeks 6 days	
Core 4	5–7 months	16 weeks–7 months 4 weeks	16 weeks–7 months 4 weeks
Core 5	9–12 months	7 months 4 weeks 1 day–13 months 4 weeks	7 months 4 weeks 1 day–13 months 4 weeks
Core 6	15–18 months	13 months 4 weeks 1 day–20 months 4 weeks	13 months 4 weeks 1 day–20 months 4 weeks
Core7	2–3 years	20 months 4 weeks 1 day–47 months 4 weeks	20 months 4 weeks 1 day–47 months 4 weeks
Core 8	B4School check	36 months–60 months	

Data Sources and Methods

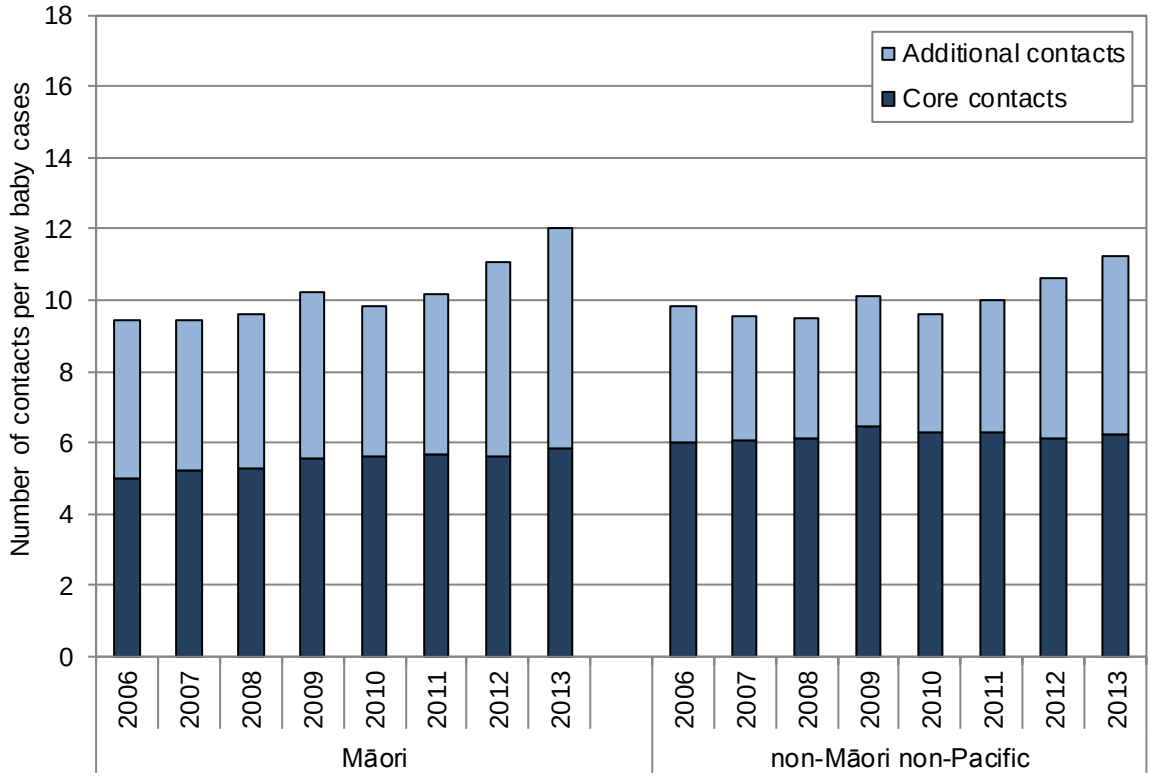
Indicator: Proportion of Plunket clients who received Well Child/Tamariki Ora contacts
Source: Plunket Database
Numerator: Number of Well Child contacts received by type of contact
Denominator: Number of new baby cases enrolled with Plunket at less than one year of age

Notes on Interpretation
Note 1: This data is based on new baby case information as extracted from the Plunket Database on 18 June 2014. Any new baby cases enrolled after one year of age is not included in these figures.
Note 2: Additional contacts are provided based on a needs assessment undertaken by the Plunket Nurse. The assessment determines the type of additional contact required, and who may undertake the contact, e.g. a health worker or another nurse.

Trends by Ethnicity

In New Zealand in the year ending June 2013, around 11,000 new Māori babies were enrolled with Plunket (**Figure 61**). The number of core contacts received by the Māori new Plunket babies increased slightly from 5.0 core contacts for the year ending June 2006 to 5.8 core contacts for the year ending June 2013. The number of additional contacts also increased, from 4.5 in 2006 to 6.2 in 2013. Compared to non-Māori non-Pacific babies, Māori Plunket babies received slightly fewer core contacts and slightly more additional contacts (**Figure 61**).

Figure 61. Plunket Well Child contacts by ethnicity, type of contact, and year, New Zealand years ended June 2006–2013



Source: Plunket

Distribution by DHB

In New Zealand, in the year ending June 2013, the number of core contacts received by Māori babies varied by DHB, from 4.9 in South Canterbury to 6.8 in Wairarapa. The number of additional face-to-face contacts was lowest in the West Coast DHB (2.0) and highest in Hawke's Bay (7.2). The numbers of group face-to-face contacts were in the range 0.0 to 0.5, and the number of telephone contacts ranged from 0.9 in Tairawhiti to 2.1 in Taranaki (**Table 29**).

Table 29. Number of Plunket contacts for new Māori babies enrolled, by contact type and DHB, New Zealand year ending June 2013

DHB	Core contacts	Additional contacts			New baby cases
		face-to-face	group face-to-face	telephone	
Number of Plunket contacts for new Māori babies enrolled					
Northland	5.6	5.3	0.0	1.1	806
Waitemata	5.6	3.5	0.2	1.4	993
Auckland	6.2	5.8	0.1	1.5	570
Counties Manukau	5.7	5.7	0.0	1.3	1,939
Waikato	5.8	4.7	0.0	1.2	1,593
Bay of Plenty	5.6	4.9	0.1	1.6	805
Lakes	5.6	4.3	0.1	1.4	511
Tairawhiti	6.1	6.1	0.0	0.9	236
Taranaki	5.9	3.5	0.3	2.1	313
Hawke's Bay	6.5	7.2	0.0	1.4	444
MidCentral	6.3	3.4	0.0	1.5	518
Whanganui	5.5	3.5	0.0	1.6	298
Hutt Valley	6.0	3.7	0.1	1.5	352
Capital & Coast	6.1	4.1	0.1	1.5	380
Wairarapa	6.8	6.7	0.0	1.5	64
Nelson Marlborough	5.5	3.2	0.4	1.9	177
South Canterbury	4.9	3.4	0.1	1.4	96
Canterbury	5.8	3.8	0.5	1.5	560
West Coast	5.4	2.0	0.0	1.0	67
Southern	6.4	3.3	0.2	1.3	472
New Zealand	5.8	4.7	0.1	1.4	11,194

Source: Plunket

THE B4 SCHOOL CHECK

Introduction

The following section uses the B4 School Check Information System to review the proportion of Māori children receiving a B4 School Check.

Background

The B4 School Check (B4SC) aims to promote the health and wellbeing of preschool age children and to identify any behavioural, developmental or health concerns that might impact on their ability to learn in the school environment [101]. It is offered to the families of all four year old children, with its key elements comprising [125]:

- A Child Health Questionnaire
- Hearing & vision screening: sweep audiometry, tympanometry, distance visual acuity
- Measurement of height and weight
- Behavioural and developmental questions using the Strengths and Difficulties Questionnaire (SDQ) and Parental Evaluation of Developmental Status (PEDS) tools
- An oral health screen using *Lift the Lip* and a check for school dental clinic enrolment
- Health promotion and education (e.g. information resources, advice and support)
- Referrals to appropriate health, education and social services where the need for these services has been identified

The B4SC itself is carried out by registered nurses with experience in child health with the help of other providers such as Vision and Hearing Technicians. Parents are provided with a full explanation of what the B4SC involves and must sign a consent form before the check can commence. Checks may take place in a variety of settings including preschools, kohanga reo, doctors' clinics, churches and marae. While most children are assessed at age four, children missing out are offered a School New Entrant Check which incudes at a minimum, hearing and vision screening [101].

Data Sources and Methods

Indicators

1. Proportion of eligible children who received a B4 School Check (coverage)

Numerator: Number of children who have received and completed their B4 School Check between the ages of 4 years and 5 years 7 days

Denominator: Number of children eligible for a B4 School Check

2. Proportion of eligible children whose caregivers declined a B4 School Check

Numerator: Number of children whose caregiver did not consent to a B4 School Check

Denominator: Number of children eligible for a B4 School Check

3. Proportion of children receiving a B4 School Check who commenced their check before 4.5 years

Numerator: Number of children who commenced a B4 School Check prior to 4.5 years of age (i.e. prior to 4 years and 6 months)

Denominator: Number of children who commenced a B4 School Check

Data Source

Numerator: B4 School Check Information System

Denominator: PHO Enrolment Collection (indicators 1 and 2 only)

Notes on Interpretation'

Note 1: The data presented cover the years 2012 to 2014 with each year ending on the 7th July.

Note 2: The calculation of coverage rates (indicator 1) includes children whose caregivers formally declined the B4 School Check but who received some of its components (e.g. hearing and vision screening; as per the Ministry of Health's usual methodology).

Note 3: Indicator 3 excludes children whose caregivers did not consent to a B4 School Check from both the numerator and the denominator

Note 4: DHB is DHB of service rather than DHB of residence

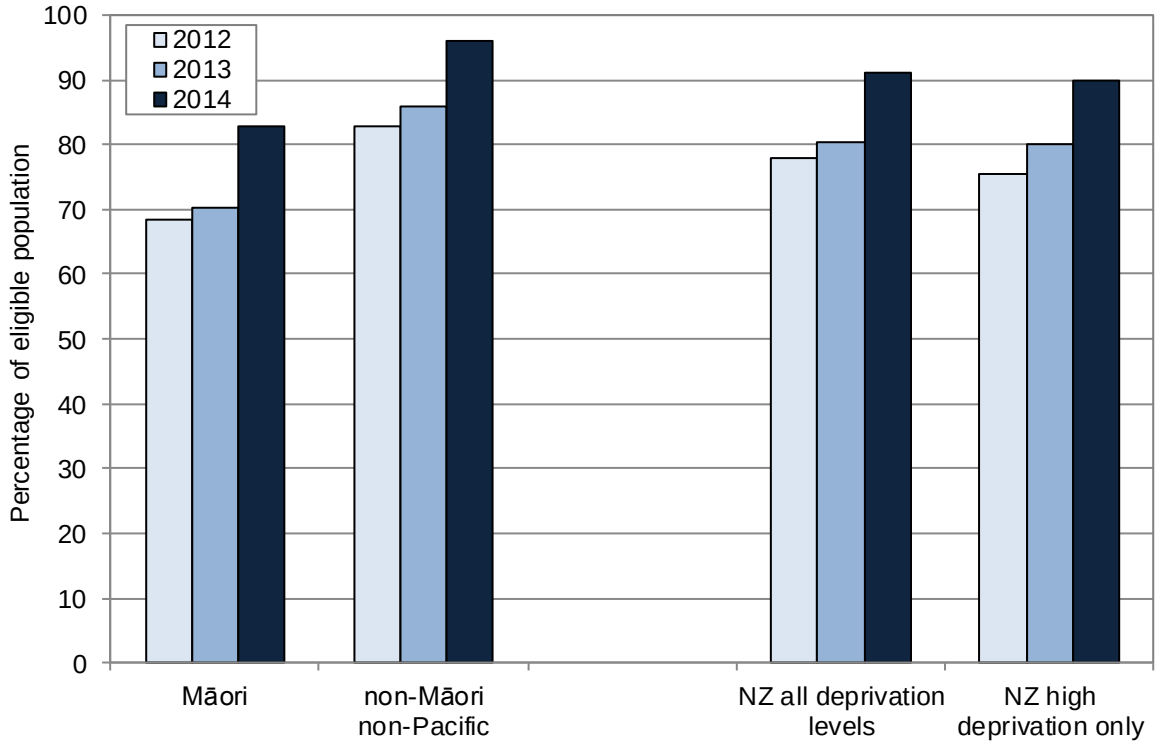
Note 5: The term *high deprivation* refers to those residing in NZ Deprivation Index decile 9–10 areas. The Ministry of Health sets coverage targets for both the total population and for those from high deprivation areas.

Note 6: While information on a wide range of ethnic groups was available from the B4 School Check Information System, denominators from the PHO Enrolment Collection were restricted to three ethnic groups: Māori, Pacific, and European/Other. Thus this analysis is restricted to these three broad ethnic groups, with the European/Other category including European, Asian/Indian, MELAA, and Other children, as well as those whose ethnicity was not stated.

Trends in coverage by ethnicity and by NZ Deprivation Decile

From 2012 to 2014 (years ending 7 July), the percentage of children who received a B4 School check increased, for all New Zealand children and also for Māori children, non-Māori non-Pacific children and children in high deprivation areas. In 2014 (year ending 7 July), 82.7% of Māori children received a B4 School check, compared to 96.1% of non-Māori non-Pacific children (**Figure 62**).

Figure 62. Proportion of children receiving their B4 School Check by ethnicity and by deprivation, New Zealand 2012–2014 (years ending 7 July)



Source: Numerator: B4 School Check Information System; Denominator: PHO Enrolment Collection; Note: high deprivation refers to those residing in NZDep decile 9–10 areas

Coverage by DHB

In 2013 (year ending 7 July), the proportion of Māori children receiving a B4 School check varied by DHB, from 64.8 % in Auckland to 114.5% in the Southern DHB. In most, but not all DHBs, a lower proportion of Māori children than non-Māori non-Pacific children received a B4 School check (**Table 30**).

Timeliness by ethnicity and by NZ Deprivation Decile

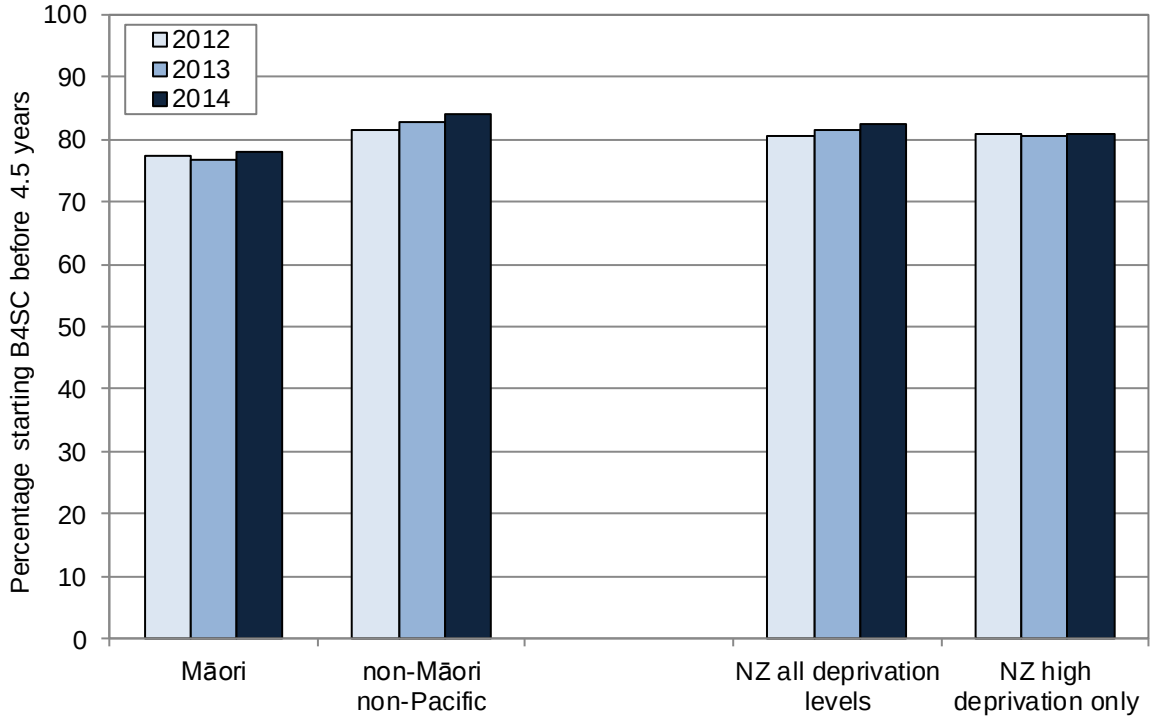
During 2012–2014 (years ending 7 July), a lower proportion of Māori children than non-Māori non-Pacific children started their B4 School Check prior to 4.5 years of age. In the year 2014 (year ending 7 July), 78.0% of Māori children and 84.1% of non-Māori non-Pacific children who received a B4 School Check had started this check prior to 4.5 years of age. There was little difference between all New Zealand children and children living in high deprivation areas in the proportion who started their B4School check prior to 4.5 years of age. In all groups, the proportion increased from 2012 to 2014 (**Figure 63**).

Table 30. Proportion of eligible children receiving B4 School Checks by DHB and ethnicity, New Zealand in the year ending 7 July 2014

DHB	Māori	non-Māori non-Pacific	Total
B4 School Check coverage rate (%)			
Northland	81.1	112.1	95.5
Waitemata	84.7	94.6	91.5
Auckland	64.8	87.5	80.1
Counties Manukau	80.3	100.6	90.2
Waikato	76.1	98.6	90.4
Bay of Plenty	77.6	99.7	91.9
Lakes	88.4	93.0	90.6
Tairawhiti	95.6	105.2	99.3
Taranaki	88.1	107.1	101.8
Hawke's Bay	88.6	99.8	94.4
MidCentral	79.3	95.1	90.5
Whanganui	99.7	97.3	98.1
Hutt Valley	77.6	96.0	90.1
Capital & Coast	68.1	97.3	90.4
Wairarapa	89.9	92.8	91.6
Nelson Marlborough	91.1	91.4	91.5
South Canterbury	100.0	113.7	112.4
Canterbury	84.1	92.0	90.3
West Coast	78.6	93.0	90.5
Southern	114.5	95.6	98.8
New Zealand	82.7	96.1	91.2

Source: B4 School Check Information System; Denominator: PHO Enrolment Collection

Figure 63. Proportion of children starting their B4 School Check before 4.5 years of age by ethnicity and by deprivation, New Zealand 2012–2014 (years ending 7 July)



Source: B4 School Check Information System; Note: high deprivation refers to those residing in NZDep decile 9–10 area

B4 SCHOOL CHECK: HEARING AND VISION SCREENING

Introduction

The following sections use the B4 School Check Information System to review hearing and vision screening outcomes for Māori children undergoing a B4 School Check.

Hearing Screening

Hearing screening and surveillance are key parts of the Well Child Tamariki Ora programme and screening begins shortly after birth as part of the Universal Newborn Hearing Screening and Early Intervention Programme. Hearing surveillance then continues at each core Well Child Check, until four years of age, when the next formal hearing screen occurs as part of the B4 School Check [101].

The B4 School Check occurs as soon as possible after the child turns four. The aims of its hearing screening component are to [101]:

1. Identify hearing loss that is likely to interfere with normal speech, language development and learning;
2. Find children with persistent middle-ear disease that is likely to lead to significant hearing loss;
3. Identify and refer children with hearing-related developmental or learning difficulties, so that appropriate intervention can be initiated prior to the child starting primary school.

Children missing this component of the B4 School Check are checked at school entry [101].

Hearing screening involves screening audiometry (also known as the sweep test), with tympanometry only being used to further assess children with an abnormal screening result (although some DHBs use targeted tympanometry screening for groups at high risk from otitis media with effusion) [101]. Following screening, one of four possible outcomes is recorded [101]:

1. **Not tested** because the child was unable or unwilling to participate. These children are booked for rescreening in three months' time
2. A **Pass** is recorded if the child hears audiometry screening levels of 20 dB at 1000, 2000 and 4000 Hz and 30 dB at 500 Hz bilaterally
3. A **Rescreen** is scheduled if the child hears 40 dB bilaterally at 1000 Hz, but does not respond to the next or any other tone
4. A child is **Referred** for further assessment if they do not respond to 40 dB in either the right or the left ear at 1000 Hz.

Referral pathways vary by region, but, in general, referrals for suspected sensorineural hearing loss are made to audiology, while referrals for suspected conductive hearing loss (e.g. due to otitis media with effusion) are made to general practitioners or ear nurses. However, as a sensorineural hearing loss may be masked by a conductive hearing loss, any identified middle ear disease must be treated and the child retested once this has resolved [101].

Data Sources and Methods

Indicators

1. *Proportion of children who required hearing rescreening*

Numerator: Number of children recorded as requiring hearing rescreening in the B4SC-IS

Denominator: Number of children who had a hearing screening outcome recorded in the B4SC-IS

2. *Proportion of children who failed audiometry and required hearing rescreening*

Numerator: Number of children who failed audiometry in one or both ears and who were recorded as requiring hearing rescreening in the B4SC-IS

Denominator: Number of children who had a hearing screening outcome recorded in the B4SC-IS

3. *Proportion of children who failed audiometry and required referral*

Numerator: Number of children who failed audiometry in one or both ears and who were recorded as requiring a referral in the B4SC-IS

Denominator: Number of children who had a hearing screening outcome recorded in the B4SC-IS

Data Source

B4 School Check Information System (B4SC-IS)

Notes on Interpretation

Note 1: Indicator 1 includes those children who underwent audiometry and were recorded as requiring rescreening, as well as those who did not undergo audiometry (e.g. as a result of developmental or behavioural issues, or for other reasons) but were recorded as requiring rescreening.

Note 2: Children whose caregivers declined the B4 School Check or its hearing screening component were excluded from all analyses, as were those who were already under care for hearing problems.

Note 3: DHB is DHB of service rather than DHB of residence

Note 4: The term *High deprivation* refers to those residing in NZ Deprivation Index decile 9–10 areas, while the term *Low-Average deprivation* refers to those residing in decile 1–8 areas.

Note 5: While information on a wide range of ethnic groups was available in the B4SC-IS, this analysis has been restricted to three broad ethnic groups: Māori, Pacific, and European/Other, in order to ensure comparability with the previous section on the B4 School Check (which explored coverage and timeliness).

Note 6: Care should be taken when interpreting DHB vs New Zealand differences or trends over time, as it is likely that many of these differences arise from local variations in service delivery, or the way DHBs record information in the B4 School Check Information System, rather than from real differences in the prevalence of hearing problems or middle ear disease in the community.

Note 7: Because of the live nature of the B4SC-IS, the number of children requiring rescreening and referral may vary over time as, in some DHBs, staff update the B4SC-IS (to either pass or refer) once the outcome of the rescreen is known. In other DHBs however, the field is left unchanged (as rescreen). While the B4SC-IS generally becomes more stable with time (as the results of children's rescreens are entered) differences in the way DHBs update the B4SC-IS after rescreening may be responsible for some of the differences seen.

Trends by ethnicity

From 2012–2014 (years ending 7 July), the percentage of children undergoing audiometry screening who required rescreening due to failed audiometry declined for Māori children, non–Māori non-Pacific children and all New Zealand children (**Figure 64**).

In 2014 (year ending 7 July, the percentage of Māori children who required rescreening because of failed audiometry was 6.5%. The percentage of Māori children who required referral following failed audiometry increased slightly between 2012 and 2013, but changed little thereafter. In 2014, 8.9% of Māori children undergoing hearing screening required referral due to failed audiometry (**Figure 64).**

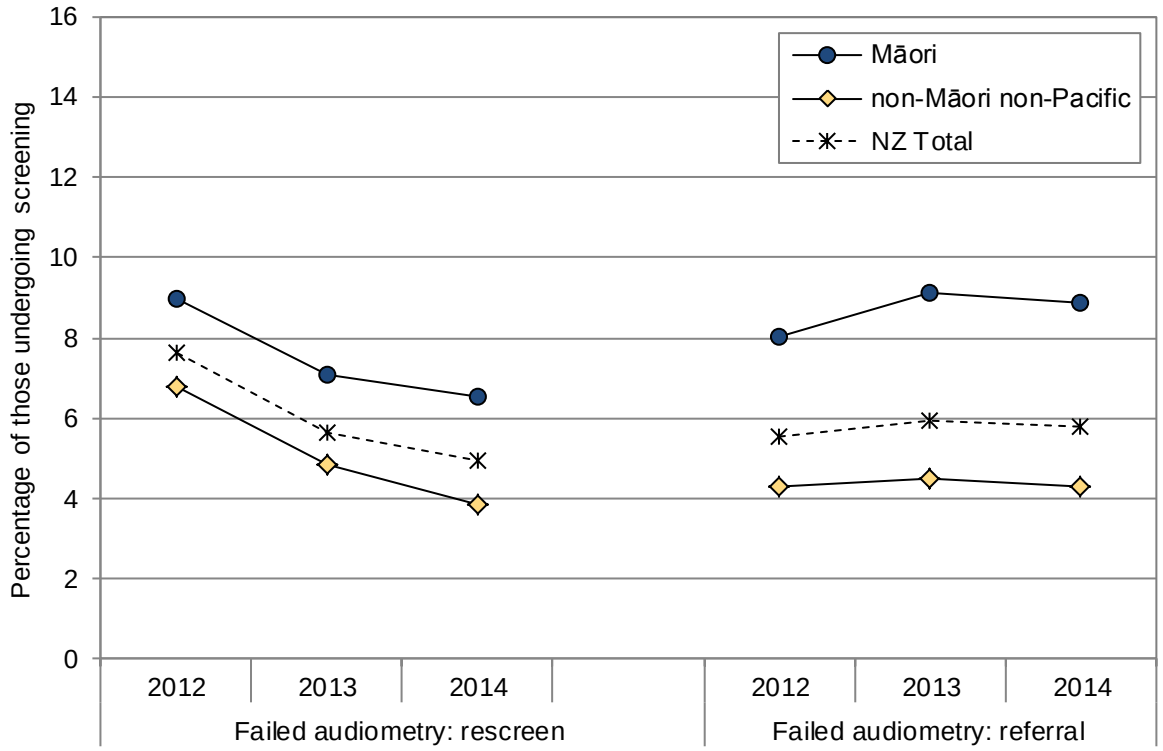
During 2012–2014 (years ending 7 July), *significantly higher* proportions of Māori than non-Māori non-Pacific children required rescreening or referral following failed audiometry (**Table 31).**

Trends by deprivation

From 2012–2014 (years ending 7 July), the percentage of children undergoing audiometry screening who required rescreening due to failed audiometry declined for both children from low-to-average deprivation areas and children from high deprivation areas. The percentage of children who required referral following failed audiometry was almost static for children from low-to-average deprivation areas, but variable for those from high deprivation areas (**Figure 65**). During 2012–2014 (years ending 7 July), *significantly higher* proportions of children from

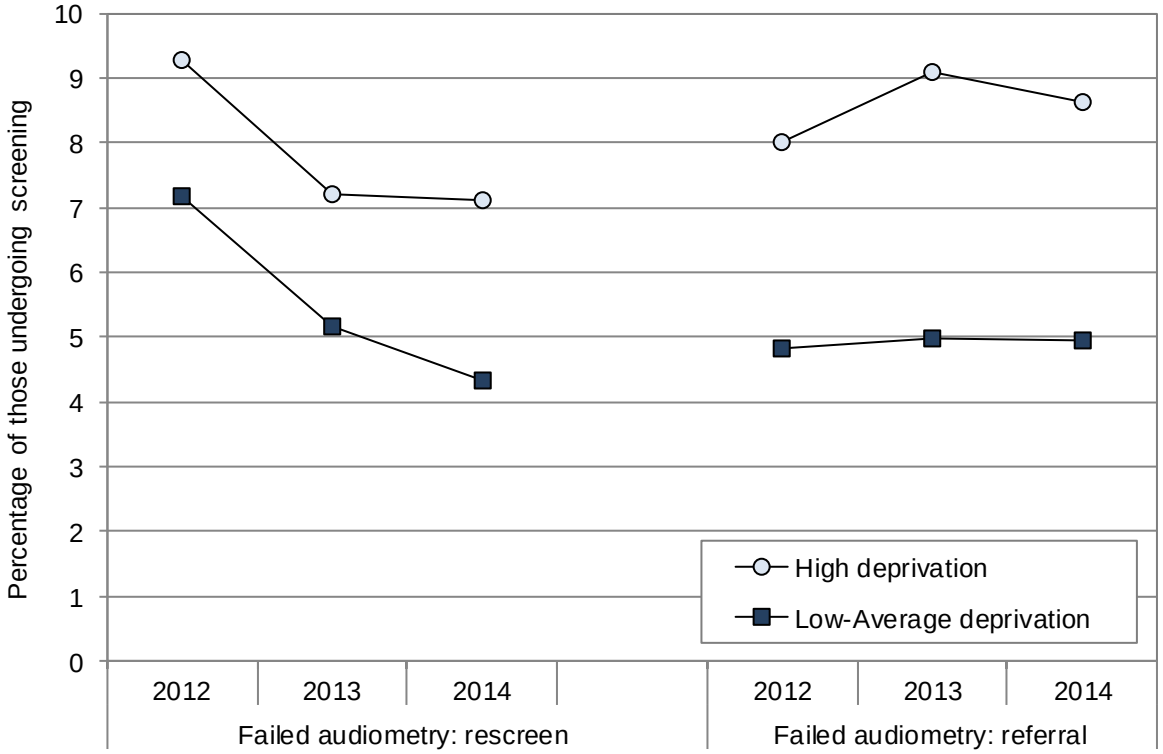
the most deprived areas (NZDep deciles 9–10 vs deciles 1–8) required rescreening or referral following failed audiometry (**Figure 64**).

Figure 64. Proportion of children failing audiometry and who required rescreening or referral by ethnicity, New Zealand B4 School Check 2012–2014 (years ending 7 July)



Source: B4 School Check Information System; Note: In this analysis non-Māori non-Pacific includes European, Asian/Indian, MELAA, Other, Not stated, and Declined to state

Figure 65. Proportion of all children failing audiometry who required rescreening or referral by NZ Deprivation Index decile, New Zealand B4 School Check 2012–2014 (years ending 7 July)



Source: B4 School Check Information System; Note: High deprivation is NZDep deciles 9-10 Low-Average deprivation is NZDep deciles 1-8

Table 31. Proportion of children failing audiometry who required rescreening or referral by ethnicity and by NZ Deprivation Index decile, New Zealand B4 School Check 2012–2014 (years ending 7 July)

Variable	Number: total 2012–2014	Number: annual average	Percent	Rate ratio	95% CI
Failed audiometry: rescreen					
NZ Deprivation Index decile					
Deciles 1–8 (low-average deprivation)	6,374	2,125	5.5	1.00	
Deciles 9–10 (high deprivation)	2,722	907	7.8	1.42	1.36–1.49
Ethnicity					
Māori	2,203	734	7.4	1.46	1.39–1.53
non-Māori non-Pacific	5,481	1,827	5.1	1.00	
Failed audiometry: referral					
NZ Deprivation Index decile					
Deciles 1–8 (low-average deprivation)	5,739	1,913	4.9	1.00	
Deciles 9–10 (high deprivation)	3,001	1,000	8.6	1.74	1.67–1.82
Ethnicity					
Māori	2,584	861	8.7	2.00	1.91–2.09
non-Māori non-Pacific	4,692	1,564	4.4	1.00	

Source: B4 School Check Information System; Note: Excludes children already under care for hearing problems; non-Māori non-Pacific includes European, Asian/Indian, MELAA, Other, Not stated, and Declined to state

Rescreening rates by DHB

The proportion of Māori children who failed audiometry and who required rescreening varied by DHB, from 0% in Taranaki to 16.1% in the Bay of Plenty. In most DHBs, the proportion of Māori children who failed audiometry and who required rescreening was higher than the proportion of non-Māori non-Pacific children (**Table 32**).

Note: Care should be taken when interpreting DHB vs New Zealand differences, as it is likely that many of these differences arise from local variations in service delivery, or the way DHBs record information in the B4 School Check Information System, rather than from real differences in the prevalence of hearing problems or middle ear disease in the community.

Table 32. Proportion of children who failed audiometry and who required rescreening by ethnicity and District Health Board, B4 School Check year ending 7 July 2014

DHB	Māori	non-Māori non-Pacific	Total
Failed audiometry: rescreen (%)			
Northland	5.4	3.9	4.6
Waitemata	5.9	2.7	3.7
Auckland	9.8	6.4	7.8
Counties Manukau	10.3	3.1	6.3
Waikato	1.2	0.5	0.7
Bay of Plenty	16.1	9.1	11.7
Lakes	1.8	0.4	1.0
Tairawhiti	2.1	1.1	1.7
Taranaki	0.0	0.1	0.1
Hawke's Bay	7.5	3.9	5.4
MidCentral	7.1	2.2	3.9
Whanganui	7.7	5.4	6.2
Hutt Valley	7.6	2.2	4.3
Capital & Coast	12.9	7.9	9.7
Wairarapa	7.4	3.5	4.6
Nelson Marlborough	0.8	0.9	0.9
South Canterbury	5.5	0.5	1.1
Canterbury	8.2	7.4	7.5
West Coast	1.9	5.3	4.8
Southern	1.9	1.1	1.2
New Zealand	6.5	3.9	5.0

Source: B4 School Check Information System; Note: Excludes children already under care for hearing problems; non-Māori non-Pacific includes European, Asian/Indian, MELAA, Other, and Not stated

Vision Screening

Approximately 10–15% of preschool children are estimated to have visual deficits, with around 1–3% having amblyopia (lazy eye) which can lead to permanent vision loss in one eye if it is not treated early. Distance visual acuity is measured as part of the B4 School Check at four years of age with a view to [126]:

1. Identifying children who may have amblyopia at an age when it may still be treatable
2. Referring children who are unable to complete the screen for further assessment

Children missing this component of the B4 School Check are checked at school entry. However, if the child is under the care of an ophthalmic/optometric practitioner, screening is unnecessary, whether the child wears glasses or not [126].

In the B4 School Check, distance visual acuity is measured using either Parr letter-matching vision charts or Sheridan Gardner charts. Screening has three possible outcomes [126]:

1. A **Pass** is recorded if the child's vision is 6/9 or better in both eyes
2. A **Rescreen** within three to six months is recorded if the child's vision is 6/9 in one eye and 6/6 in the other (as one eye may be improving or one eye getting worse and a rescreen will distinguish between the two)
3. A **Refer** is recorded if the child's vision is 6/12 or worse in one or both eyes. Referrals are made either to an ophthalmologist or an optometrist, depending on practitioner availability and parental preference.

Data Sources and Methods

Indicator

1. *Proportion of children not already under care for vision problems who were recorded as having a visual acuity of 6/12 or worse in one or both eyes*

Numerator: Number of children with a visual acuity of 6/12 or worse in one or both eyes recorded in the B4SC-IS, who were not already under care for a vision problem

Denominator: Number of children who had a vision screening outcome recorded in the B4SC-IS and who were not already under care for a vision problem

Data Source

B4 School Check Information System (B4SC-IS)

Notes on Interpretation

Note 1: Children whose caregivers declined the B4 School Check or its vision screening component were excluded from all analyses, as were those who were already under care for a vision problem.

Note 2: DHB is DHB of service rather than DHB of residence

Note 3: The term *High Deprivation* refers to those residing in NZ Deprivation Index decile 9-10 areas, while the term *Low-Average Deprivation* refers to those residing in decile 1–8 areas.

Note 4: While information on a wide range of ethnic groups was available in the B4SC-IS, this analysis has been restricted to three broad ethnic groups: Māori, Pacific and European/Other, in order to ensure comparability with the previous section on the B4 School Check (which explored coverage and timeliness).

Note 5: Care should be taken when interpreting ethnic and socioeconomic differences as it is unclear whether they reflect real differences in the underlying prevalence of vision problems, or differences in early identification and access to care (as children already under care for a vision problem have been excluded from the analysis).

Note 6: Care should be taken when interpreting DHB vs New Zealand differences or trends over time, as it is likely that many of these differences arise from local variations in service delivery, or the way DHB staff record information in the B4 School Check Information System, rather than from real differences in the prevalence of vision problems in the community.

Trends by ethnicity

During 2012 to 2014 (years ending 7 July), the percentage of children failing vision screening changed little for Māori, non-Māori non-Pacific or all New Zealand children. The percentage of Māori children failing vision screening was consistently a little higher than the percentage of non-Māori non-Pacific children. In 2014 it was 5.8%, compared to 4.9% for non-Māori non-Pacific children (**Figure 66**). The average difference for 2012–2014 was *statistically significant* (**Table 33**).

Trends by deprivation

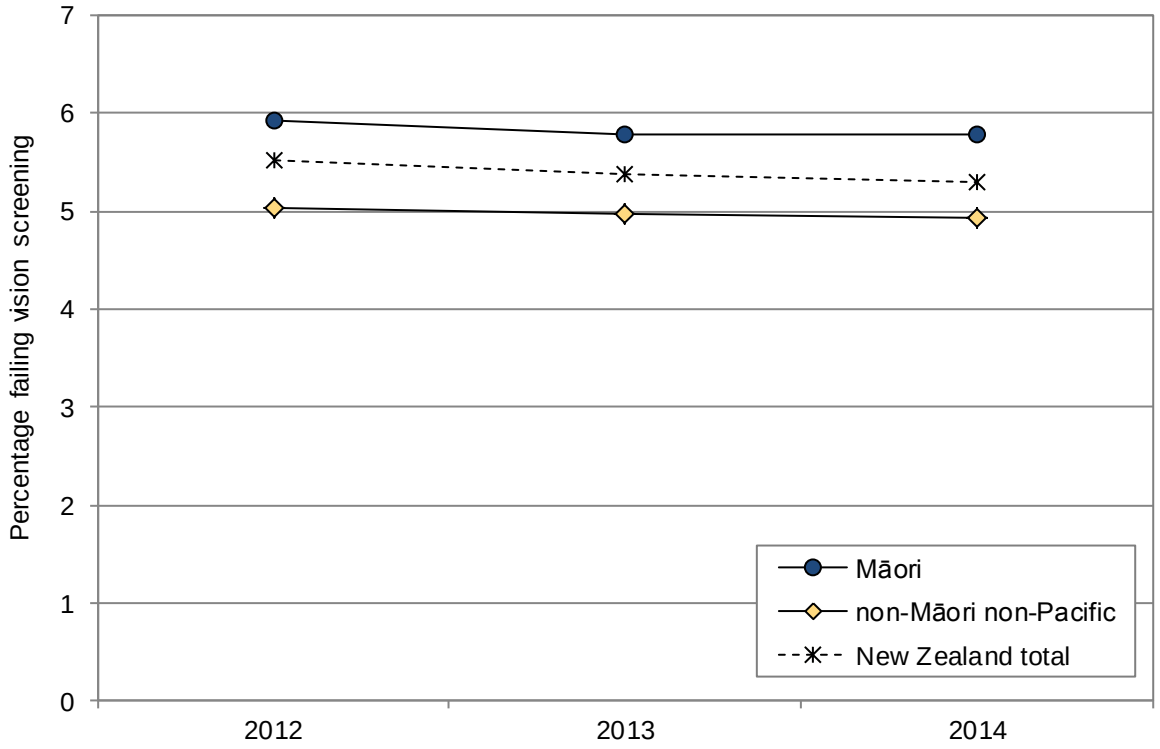
During 2012 to 2014 (years ending 7 July), the percentage of children failing vision screening was consistently higher in children from high deprivation areas than in children from low-to-average deprivation areas. The average difference was *statistically significant* (**Table 33**). The percentage failing in high deprivation areas declined slightly, from 7.3% in 2012 to 6.6% in 2014, while the percentage failing in low-to-average deprivation areas stayed close to 5% (**Figure 67**).

Distribution by DHB

In 2014 (year ending 7 July), the percentage of Māori children failing vision screening varied between DHBs, from 0% in the West Coast to 11.1% in Capital and Coast. The percentage of Māori children failing vision screening was higher than the percentage of non-Māori non-Pacific children failing in some DHBs, but lower in others (**Table 34**).

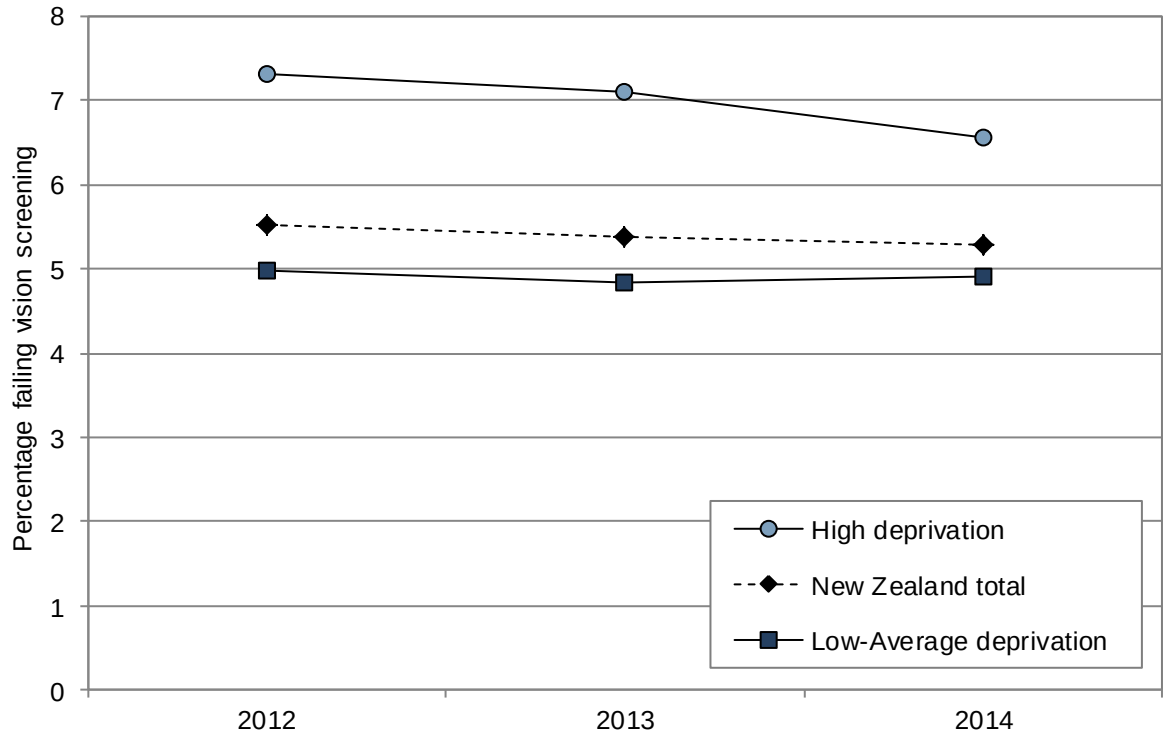
Note: Care should be taken when interpreting differences identified in this section as it is unclear whether they reflect real differences in the underlying prevalence of vision problems, or differences in early identification and access to care (as children already under care for a vision problem have been excluded from the analysis).

Figure 66. Proportion of children not already under care with a visual acuity of 6/12 or worse in one or both eyes by ethnicity, New Zealand B4 School Check 2012–2014 (years ending 7 July)



Source: B4 School Check Information System; Note: In this analysis European/Other includes European, Asian/Indian, MELAA, Other, Not stated, and Declined to state

Figure 67. Proportion of children not already under care with a visual acuity of 6/12 or worse in one or both eyes by NZ Deprivation Index decile, New Zealand B4 School Check 2012–2014 (years ending 7 July)



Source: B4 School Check Information System; Note: In this analysis European/Other includes European, Asian/Indian, MELAA, Other, Not stated, and Declined to state

Table 33. Proportion of children not already under care with a visual acuity of 6/12 or worse in one or both eyes by ethnicity and NZ Deprivation Index decile, New Zealand B4 School Check 2012–2014 (years ending 7 July)

Variable	Number: total 2012–2014	Number: annual average	Percent	Rate ratio	95% CI
Visual acuity of 6/12 or worse on one or both eyes					
NZ Deprivation Index decile					
Deciles 1–8 (low-average deprivation)	5,710	1,903	4.9	1.00	
Deciles 9–10 (high deprivation)	2,459	820	7.0	1.42	1.35–1.48
Ethnicity					
Māori	1,762	587	5.8	1.17	1.11–1.23
non-Māori non-Pacific	5,330	1,777	5.0	1.00	

Source: B4 School Check Information System; Note: In this analysis European/Other includes European, Asian/Indian, MELAA, Other, Not stated, and Declined to state

Table 34. Proportion of children not already under care with a visual acuity of 6/12 or worse in one or both eyes by ethnicity and District Health Board, B4 School Check 2014 (year ending 7 July

DHB	Māori	non-Māori non-Pacific	Total
Visual acuity 6/12 or worse on one or both eyes (%)			
Northland	6.1	3.4	4.5
Waitemata	5.3	2.9	3.5
Auckland	7.0	5.1	5.3
Counties Manukau	9.4	7.6	8.4
Waikato	2.8	1.4	1.8
Bay of Plenty	4.9	5.8	5.6
Lakes	5.8	7.3	6.5
Tairawhiti	3.7	2.2	3.2
Taranaki	7.8	5.6	6.1
Hawke's Bay	4.4	4.1	4.1
MidCentral	7.2	8.3	8.0
Whanganui	2.8	3.6	3.2
Hutt Valley	7.3	7.5	7.2
Capital & Coast	11.1	6.9	7.6
Wairarapa	6.6	7.0	6.7
Nelson Marlborough	1.2	1.0	1.1
South Canterbury	4.1	7.3	7.1
Canterbury	6.4	6.2	6.2
West Coast	0.0	5.8	5.0
Southern	4.6	3.4	3.5
New Zealand	5.8	4.9	5.3

Source: B4 School Check Information System; Note: In this analysis European/Other includes European, Asian/Indian, MELAA, Other, Not stated, and Declined to state

ORAL HEALTH

Introduction

The following section reviews the oral health status of Māori children and young people using information from two separate sources. The first is Community Oral Health Service data, which provides information on the proportion of children who were caries-free at 5 years, and the number who had decayed, missing, or filled teeth (DMFT) at 12 years. A separate sub-section considers the proportion of eligible young people accessing publicly funded dental services. The second data source is the National Minimum Dataset, which provides information on hospital admissions for dental caries in children and young people.

Background

In New Zealand, District Health Boards fund and provide free dental care for children and adolescents. Pre-school and primary school aged children receive care at Community Oral Health Clinics, many of which are located at schools. There are also mobile clinics which often serve remote and rural areas. There has been consolidation of services in many areas so it is no longer the case that most primary schools have a dental clinic. Young people up to the age of 18 can receive free care from private dentists contracted by the DHB [127].

The Ministry of Health's Early Childhood Oral Health Toolkit [128] notes that, in 2005, 48% of all children had experienced dental caries at five years of age and that there were significant inequalities in children's oral health between Māori and non-Māori. Recognising that that the risk of dental decay begins as soon as teeth begin to appear in the mouth (at around six months of age) and that some children experience significant dental caries before the traditional age of enrolment with Child Oral Health Services at 2½ years of age, the toolkit recommends that Well Child/Tamariki Ora and other non-oral health providers undertake a "Lift the Lip" caries risk assessment in all children at between nine and 12 months of age, ensure that all children are enrolled with a dental service by 12 months of age and ensure that the information from the caries risk assessment is sent to the local DHB child oral health services provider. High risk children should have contact with an oral health provider at 12 months of age and all children should have contact by 2½ years of age.

Community Oral Health Services

Data Sources and Methods

Indicators

1. *Proportion of children who were caries-free at age 5 years*

Numerator: Number of children aged 5 years whose deciduous teeth were caries-free on completion of treatment with an oral health service.

Denominator: Total number of 5 year olds who were examined in the year

2. *Mean number of decayed, missing or filled teeth (DMFT) at age 12 years*

Numerator: Number of permanent teeth of children aged around 12 years that are decayed, missing (due to caries) or filled on completion of treatment in Year 8, prior to leaving the oral health service

Denominator: Total number of Year 8 children who were examined in the year

Notes on Interpretation

Note 1: The data in this section was obtained from http://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/oral-health-data-and-stats. The Ministry of Health collates this information from the oral health services. From 2010, information was provided by community oral health services which replaced school dental services. Once children are enrolled with an oral health service they are seen, assessed and have appropriate treatment prescribed. Upon completion of treatment, dental health status data are collected on 5 year-olds and children in Year 8 (aged approximately 12 years).

Note 2: In this section, fluoridation status refers to the water supply of the service which the student attended, rather than the fluoridation status of the area in which they resided.

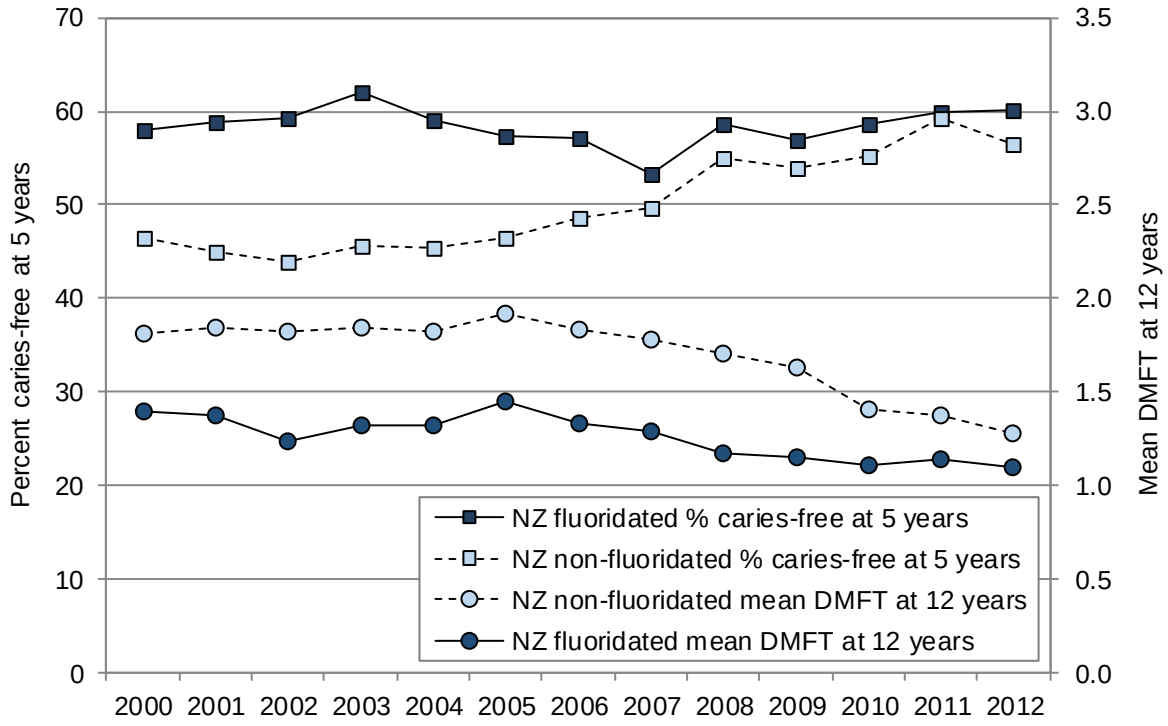
Note 3: Tests of statistical significance have not been applied to the data in this section, and thus any associations described do not imply statistical significance or non-significance.

New Zealand Distribution and Trends

New Zealand Trends

In New Zealand from 2000 to 2012, the percentage of all children who were caries-free at age 5 years was consistently higher in areas with fluoridated water supplies. Children aged 12 years in areas with non-fluoridated water supplies had higher mean scores for the number of decayed, missing or filled teeth (DMFT) than did children in areas with fluoridated water supplies **(Figure 68)**.

Figure 68. Percentage of children who were caries-free at 5 years and mean DMFT scores at 12 years, New Zealand 2000–2012



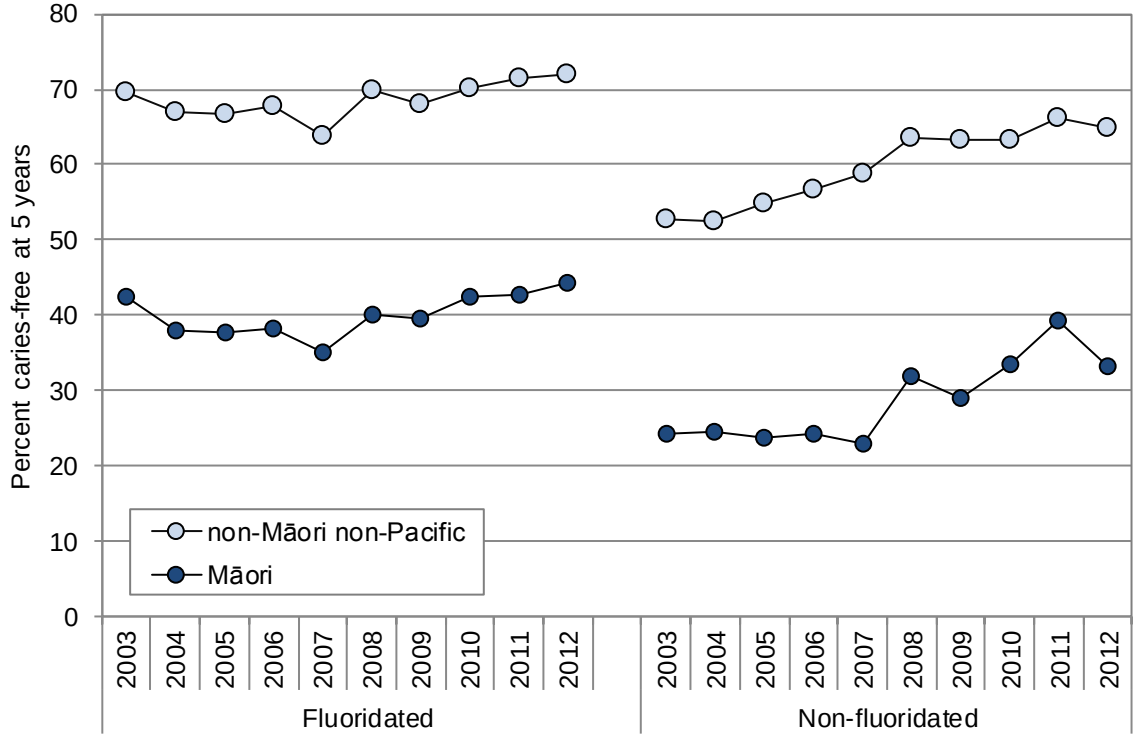
Source: Ministry of Health

New Zealand Distribution by Ethnicity

In New Zealand, from 2003 to 2012, a higher proportion of non-Māori non-Pacific children than Māori children were caries-free at age 5 years. For both Māori children and non-Māori non-Pacific children, the proportion who were caries-free was higher in areas with fluoridated water (**Figure 69**).

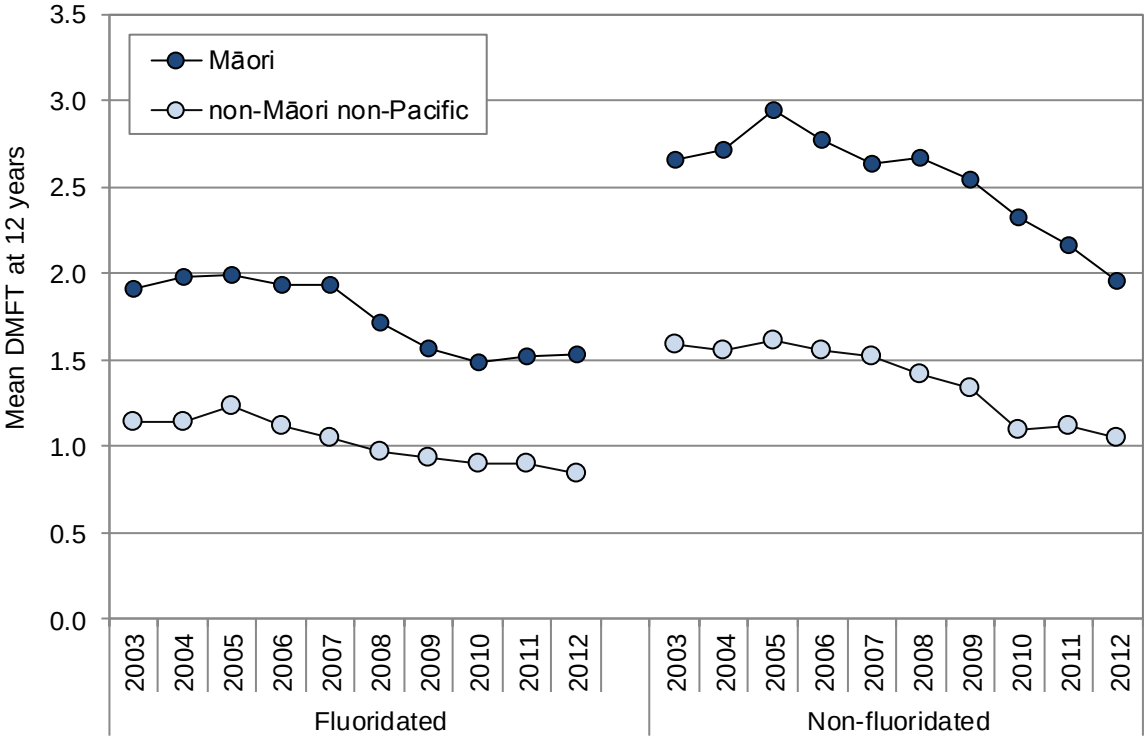
In New Zealand from 2003 to 2012, mean DMFT scores at age 12 years were higher for Māori children compared with non-Māori non-Pacific children. For each ethnic group, mean DMFT scores were higher for children in areas with non-fluoridated water supplies (**Figure 70**).

Figure 69. Percentage of children who were caries-free at age 5 years by ethnicity, New Zealand 2003–2012



Source: Ministry of Health

Figure 70. Mean scores for the number of decayed, missing or filled permanent teeth (DMFT) at age 12 years by ethnicity, New Zealand 2003–2012



Source: Ministry of Health

Hospital Admissions for Dental Caries

Data Sources and Methods

Indicators

1. *Hospital admissions for dental caries in children and young people aged 0–24 years*

Numerator: National Minimum Dataset (NMDS): Hospital admissions (acute, semi acute and waiting list) for children and young people aged 0–24 years with a primary ICD-10-AM diagnosis of dental caries (K02). Other dental conditions assessed in some tables include: Disorders of tooth development/eruption (K00), Embedded/ impacted teeth (K01), Other diseases of the teeth hard tissue (K03), Diseases of the pulp/periapical tissue (K04), Gingivitis/Peridontal diseases (K05), Other disorders of the gingiva/edentulous alveolar ridge (K06), Dentofacial anomalies/malocclusion (K07), Other disorders of the teeth or supporting structures (K08).

Denominator: Statistics NZ estimated resident population (with linear extrapolation to calculate denominators between Census years).

Notes on Interpretation

Note 1: An acute admission is an unplanned admission occurring on the day of presentation, while a semi-acute admission (referred to in NMDS as an arranged admission) is a non-acute admission with the admit date being <7 days after the date the decision was made that the admission was necessary. A waiting list admission is a planned admission, where the admission date is 7+ days after the date the decision was made that the admission was necessary. In New Zealand, most DHBs admit children and young people with dental caries/other oral health problems, either from the waiting list, or on a semi-acute basis (as an arranged admission).

Note 2: **Appendix 2** outlines the limitations of the hospital admission data used. The reader is urged to review this appendix before interpreting any trends based on hospital admission data.

Note 3: 95% confidence intervals have been provided for the rate ratios in this section and where appropriate, the terms significant or not significant have been used to communicate the significance of the observed associations. Tests of statistical significance have not been applied to other data in this section, so unless the terms 'significant' or 'non-significant' are specifically used the associations described do not imply statistical significance or non-significance (see **Appendix 1** for further discussion of this issue).

New Zealand Distribution and Trends

New Zealand trends

In New Zealand during 2000–2013, for all children, hospital admission rates for dental caries were highest for children aged 0–4 years, followed by children aged 5–14 years, and then young people aged 15–24 years. While admissions increased for all three age groups during 2000–2013, in absolute terms, the increases were greater for those aged 5–14 and 0–4 years (**Figure 71**).

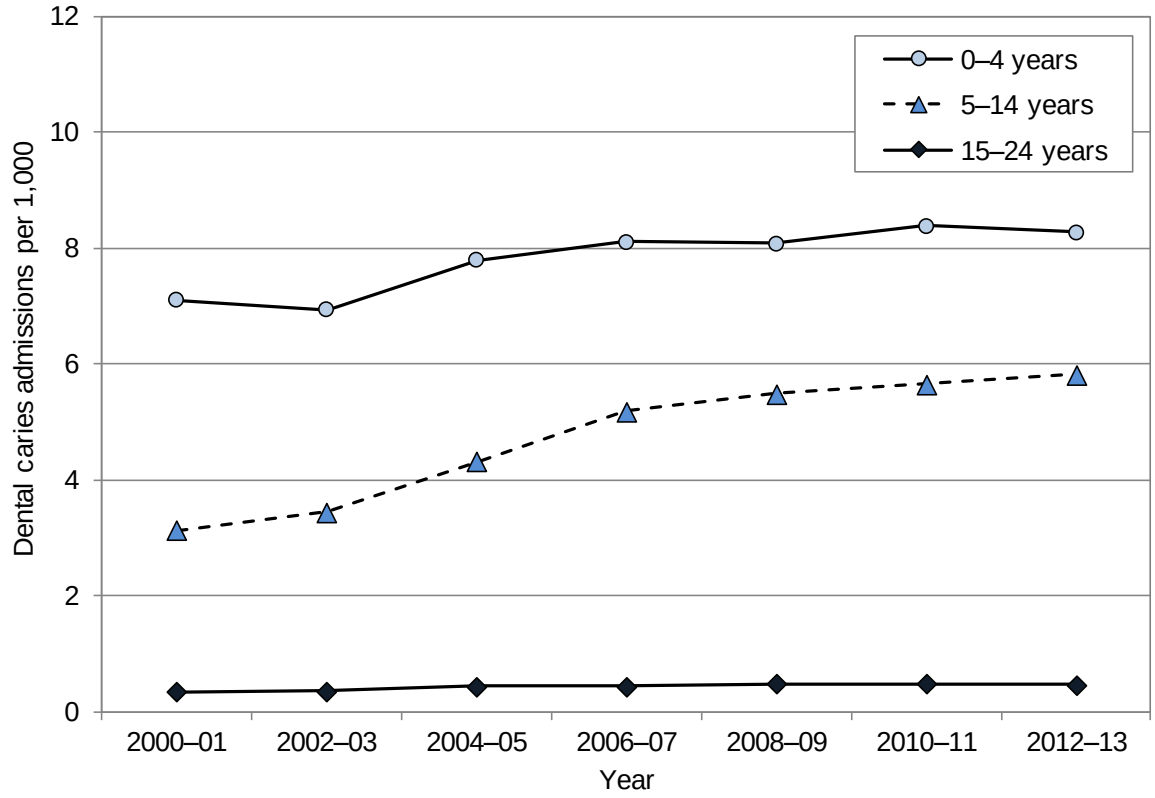
New Zealand distribution by age

In New Zealand during 2009–2013, for Māori children, hospital admissions for dental caries were infrequent in infants <1 year, but rose rapidly thereafter with increasing age, to reach a peak at 4 years of age, and then decreased. There were few admissions after 14 years of age (**Figure 72**).

New Zealand distribution by primary diagnosis

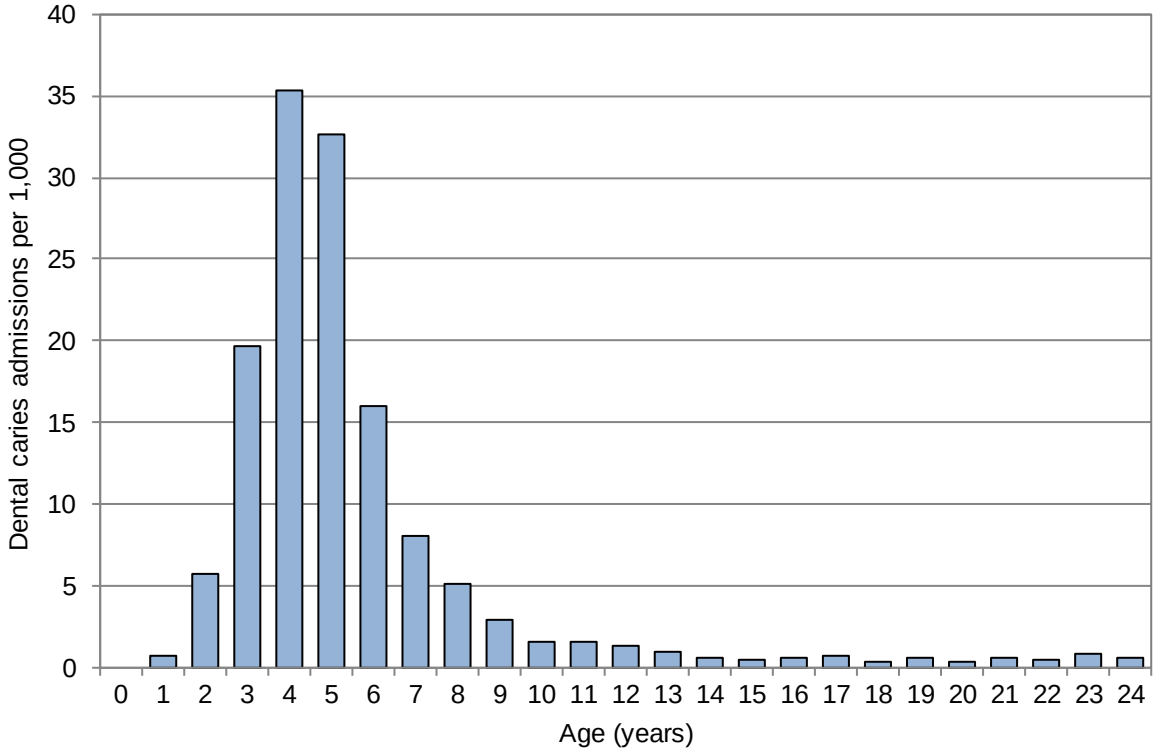
In New Zealand during 2009–2013, dental caries, followed by diseases of the pulp and periapical tissue, were the leading reasons for a dental admission in Māori children aged 0–4 and aged 5–14 years. In contrast, embedded/impacted teeth, followed by dental caries were the leading reasons for an admission in Māori young people aged 15–24 years (**Table 35**).

Figure 71. Hospital admissions for dental caries in all children and young people aged 0−24 years, New Zealand 2000–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population

Figure 72. Hospital admissions for dental caries in Māori children and young people by age, New Zealand 2009–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population

Table 35. Hospital admissions for dental conditions in Māori children and young people aged 0–24 years by primary diagnosis, New Zealand 2009–2013

Primary diagnosis	Number: total 2009−2013	Number: annual average	Rate per 1,000	Percent
Dental conditions in Māori children and young people				
0–4 years				
Dental caries	4,972	994.4	12.29	89.7
Diseases of the pulp/periapical tissue	481	96.2	1.19	8.7
Disorders of tooth development/eruption	27	5.4	0.07	0.5
Other disorders of the teeth/supporting structures	25	5.0	0.06	0.5
Gingivitis/peridontal diseases	16	3.2	0.04	0.3
Dentofacial anomalies/malocclusion	5	1.0	0.01	0.1
Other diseases of the teeth hard tissue	6	1.2	0.01	0.1
Other disorders of the gingiva/edentulous alveolar ridge	5	1.0	0.01	0.1
Embedded/impacted teeth	5	1.0	0.01	0.1
Total 0–4 years	5,542	1,108.4	13.70	100.0
5–14 years				
Dental caries	5,503	1,100.6	7.49	82.6
Diseases of the pulp/periapical tissue	629	125.8	0.86	9.4
Disorders of tooth development/eruption	202	40.4	0.27	3.0
Embedded/impacted teeth	170	34.0	0.23	2.6
Dentofacial anomalies/malocclusion	50	10.0	0.07	0.8
Other disorders of the teeth/supporting structures	46	9.2	0.06	0.7
Other diseases of the teeth hard tissue	30	6.0	0.04	0.5
Gingivitis/peridontal diseases	23	4.6	0.03	0.3
Other disorders of the gingiva/edentulous alveolar ridge	7	1.4	0.01	0.1
Total 5–14 years	6,660	1,332.0	9.06	100.0
15–24 years				
Embedded/impacted teeth	484	96.8	0.78	35.1
Dental caries	341	68.2	0.55	24.8
Diseases of the pulp/periapical tissue	313	62.6	0.50	22.7
Dentofacial anomalies/malocclusion	67	13.4	0.11	4.9
Gingivitis/peridontal diseases	76	15.2	0.12	5.5
Other disorders of the teeth/supporting structures	45	9.0	0.07	3.3
Other diseases of the teeth hard tissue	31	6.2	0.05	2.3
Disorders of tooth development/eruption	13	2.6	0.02	0.9
Other disorders of the gingiva/edentulous alveolar ridge	7	1.4	0.01	0.5
Total 15–24 years	1,377	275.4	2.21	100.0

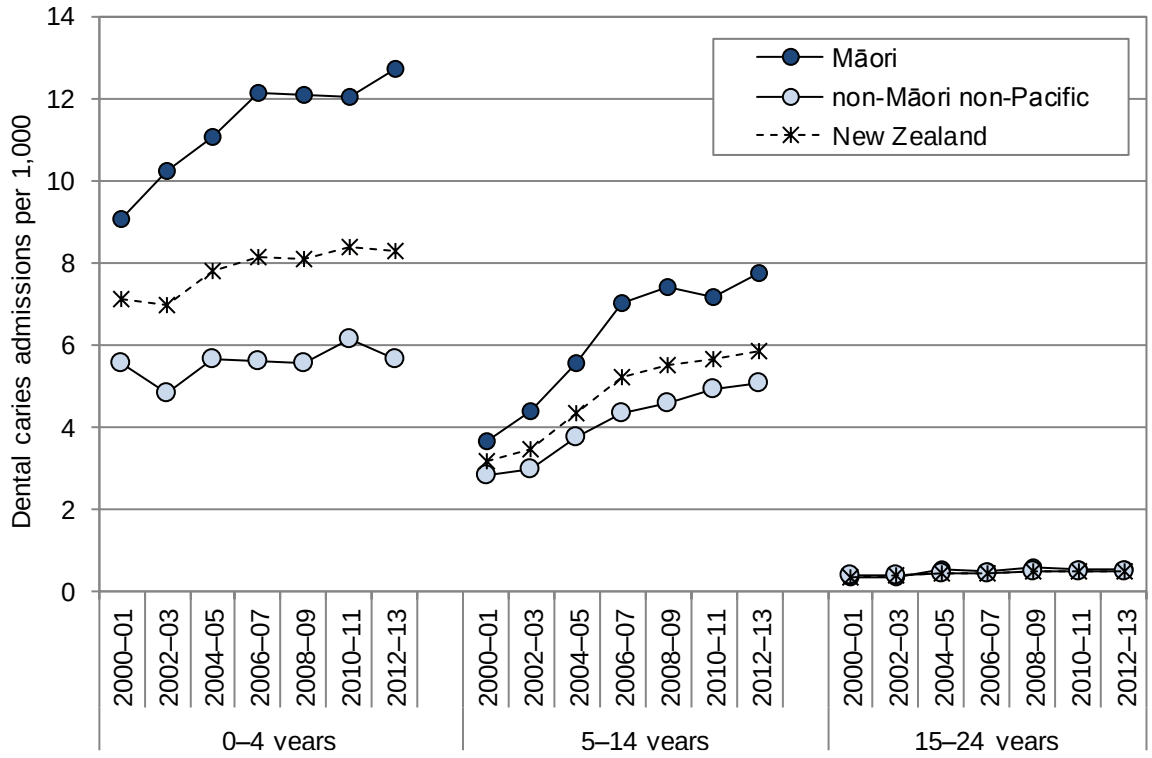
Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Māori Population

New Zealand trends and distribution by ethnicity

Over the period 2000 to 2013, hospital admissions for dental caries increased for Māori children, in the 0–4 years age group (up 40%), in the 5–14 years age group (up 112%) and in the 15–24 years age group (up 49%). Over the same period, there was little change in non-Māori non-Pacific children's admission rates in the 0–4 years age group, but there were

increases in the 5−14 years age group (up 80%) and in the 15–24 years age group (up 39%) **(Figure 73**). During 2000–2013, hospital admissions for dental caries were significantly higher for Māori than non-Māori non-Pacific children and young people in all age groups. The difference between the ethnic groups was greatest for 0–4 year olds, where the Māori rate was double the non-Māori non-Pacific rate, but it was small in the 15–24 years age group (**Figure 73**, **Table 36**).

Figure 73. Hospital admissions for dental caries in children and young people aged 0–24 years by ethnicity, New Zealand 2000–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population.

Table 36. Hospital admissions for dental caries in children and young people aged 0−24 years by ethnicity, New Zealand 2009–2013

Ethnicity	Number: total 2009−2013	Number: annual average	Rate per 1,000	Rate ratio	95% CI
Dental caries					
0–4 years					
Māori	4,972	994	12.29	2.10	2.03–2.19
non-Māori non-Pacific	5,653	1,131	5.84	1.00	
5–14 years					
Māori	5,503	1,101	7.49	1.51	1.46–1.56
non-Māori non-Pacific	9,784	1,957	4.95	1.00	
15–24 years					
Māori	341	68	0.55	1.14	1.01–1.29
non-Māori non-Pacific	1,068	214	0.48	1.00	

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population

SUBSTANCE USE

SMOKING IN PREGNANCY

Introduction

The following section uses data from the National Maternity Collection to examine smoking status during and after pregnancy among Māori women who were registered with a lead maternity carer.

Background

Smoking in pregnancy is widely regarded as the most important modifiable risk factor for poor pregancy outcomes [129]. It is associated with an increased risk of anaemia, pre-term birth, placental abruption, placenta praevia, chronic hypertension, low birth weight, restricted growth in utero and fetal and neonatal death [129-131]. Research has suggested that children whose mothers smoked in pregnancy have higher rates of conduct disorders [132] and attention deficit hyperactivity disorder [133] although it is uncertain to what extent smoking, as opposed to inherited personality traits or other social or environmental factors, is responsible for this [134].

The longitudinal study "Growing Up in New Zealand" recruited around 7,000 pregnant women from the Auckland, Counties-Manukau and Waikato DHB regions who were expected to deliver in a 12 month period during 2009–2010. More than one in three Māori women in the study smoked during pregnancy but the proportion smoking during pregnancy was lower than proportion smoking before pregnancy [135].

Barriers to smoking cessation among pregant Māori women have been examined and found to include living with at least one other smoker, socialising mainly with other smokers, using smoking to cope with stress, and having a poor understanding of the risks associated with smoking in pregnancy. The involvement of the whole whānau in interventions to promote smokefree pregnancies has been identified as being important [136,137].

Data Sources and Methods

Indicator

1. *Proportion of babies born to mothers registered and not registered with a Lead Maternity Carer (LMC) at the time of delivery*

Numerator: Number of babies born to mothers who were registered or not registered with a LMC at the time of delivery

Denominator: Number of babies born

2. *Proportion of babies born to mothers who smoked at first registration with a LMC and/or at two weeks post-delivery*

Numerator: Number of babies born to mothers who smoked at first registration with a LMC and/or at two weeks post-delivery

Denominator: Number of babies born to mothers who were registered with a LMC at the time of delivery

Data source

National Maternity Collection

Notes on Interpretation

Note 1: The National Maternity Collection (MAT) contains information on selected publicly funded maternity services from nine months before to three months after a birth. It integrates information from two data sources: LMC claims for payment for Primary Maternity Services provided under Section 88 of the NZ Public Health and Disability Act 2000; and birth event data from the National Minimum Dataset (NMDS) on hospital admissions (delivery event for the mother and the postnatal period for baby). A limitation of this source is its integration of two data sources. Since different information may be collected in each set, multiple records may exist for the same baby.

Up until June 2007, Section 88 claims data coverage was 95% of known births. However, in July 2007, due to a funding change, DHB-employed midwifery teams ceased to submit claims to the Ministry of Health for their services. Thus no LMC registration data (including smoking status) is currently available in MAT for women who opt for DHB-based primary maternity care. In this dataset it is difficult to distinguish between those who were not registered with a LMC at the time of delivery because they accessed their primary maternity care through DHB services, and those who received no antenatal care at all.

Note 2: Smoking status is self-reported by the mother to the LMC at two points: first registration with the LMC and two weeks post-delivery (postnatal). It is important to note that a woman can be registered with a LMC at any stage throughout the pregnancy, including at delivery.

Note 3: Smoking status was derived based on the provision of either a 'Y' for smoking status or a count of the number of cigarettes smoked at first registration and/or at two weeks postnatal.

Babies born to mothers registered and not registered with a LMC at Delivery

New Zealand distribution by ethnicity

In New Zealand during 2008–2010, 14.7% of Māori babies and 11.2% of non-Māori non-Pacific babies were born to mothers who were not registered with a LMC at the time of delivery. However, many of these babies' mothers may have accessed hospital-based maternity services, so it is difficult to estimate the proportion of babies who were born to mothers who received no antenatal care at all during pregnancy (**Table 37**).

Table 37. Status of maternal registration with a Lead Maternity Carer at the time of delivery for New Zealand babies born, 2008−2012, by ethnicity

Maternal LMC registration status at delivery	Number of babies: total 2008−2012	Number of babies: annual average	Per cent of babies	Per cent of NZ total
New Zealand				
Registered with a LMC	268,309	53,662	84.7	
Not registered with a LMC	47,926	9,585	15.1	
LMC registration status not known	644	129	0.2	
Total	316,879	63,376	100.0	
Māori babies				
Registered with a LMC	71,798	14,360	85.2	22.7
Not registered with a LMC	12,406	2,481	14.7	3.9
LMC registration status not known	105	21	0.1	0.0
Total	84,309	16,862	100.0	26.6
non-Māori non-Pacific babies				
Registered with a LMC	174,633	34,927	88.5	55.1
Not registered with a LMC	22,177	4,435	11.2	7.0
LMC registration status not known	515	103	0.3	0.2
Total	197,325	39,465	100.0	62.3

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

New Zealand distribution by DHB

In New Zealand during 2008–2012, the proportion of Māori babies who were born to a mother not registered with a LMC at the time of delivery varied according to DHB, from 0.5% in the Bay of Plenty to 52% on the West Coast. The percentage of such babies was significantly lower than the percentage for New Zealand as a whole in Waikato, Bay of Plenty, Lakes, Tairawhiti, Taranaki, MidCentral, Hutt Valley, Capital and Coast, South Canterbury, Canterbury and Southern DHBs. It was significantly higher in Northland, Auckland, Counties Manukau, Whanganui, Nelson Marlborough and the West Coast DHBs (**Table 38**).

Table 38. Status of maternal registration with a lead maternity carer at the time of delivery for Māori babies born 2008−2012, by District Health Board

DHB	No. of babies: total 2008–2012			Mother not registered: rate per 100 babies	Rate ratio	95% CI
	Mother not registered with LMC	Mother registered with LMC	Total			
Māori babies with mothers registered with a LMC at delivery						
Northland	1,513	4,916	6,430	23.5	1.60	1.53–1.68
Waitemata	1,014	6,199	7,238	14.0	0.95	0.90–1.01
Auckland	1,216	3,018	4,235	28.7	1.95	1.86–2.05
Counties Manukau	3,537	6,945	10,482	33.7	2.29	2.22–2.37
Waikato	1,012	9,253	10,267	9.9	0.67	0.63–0.71
Bay of Plenty	31	6,458	6,489	0.5	0.03	0.02–0.05
Lakes	393	4,084	4,477	8.8	0.60	0.54–0.66
Tairawhiti	30	2,665	2,695	1.1	0.08	0.05–0.11
Taranaki	55	2,465	2,520	2.2	0.15	0.11–0.19
Hawke's Bay	716	4,494	5,210	13.7	0.93	0.87–1.00
MidCentral	202	3,456	3,707	5.4	0.37	0.32–0.42
Whanganui	583	1,268	1,852	31.5	2.14	2.00–2.29
Hutt Valley	397	2,654	3,052	13.0	0.88	0.81–0.97
Capital & Coast	341	3,311	3,653	9.3	0.63	0.57–0.70
Wairarapa	110	716	826	13.3	0.91	0.76–1.08
Nelson Marlborough	287	1,246	1,533	18.7	1.27	1.14–1.41
South Canterbury	10	416	426	2.3	0.16	0.09–0.29
Canterbury	179	4,600	4,802	3.7	0.25	0.22–0.29
West Coast	159	144	303	52.5	3.57	3.20–3.97
Southern	74	3,135	3,209	2.3	0.16	0.12–0.20
New Zealand	12,406	71,798	84,309	14.7	1.00	

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

Maternal smoking

New Zealand distribution by maternal smoking status and ethnicity

In New Zealand during 2008–2012, 56.9% of Māori babies were born to mothers who were non-smokers both at first registration with a LMC and two weeks after their babies were born, while 30.3% of Māori babies were born to mothers who were smokers both at first registration with a LMC and two weeks after their babies were born. Some Māori babies had mothers who reported smoking at first registration but not at two weeks post-delivery (4.9%) and some had mothers who were non-smokers at registration but smokers at two week post-delivery (2.5%). In contrast, 87.7% of non-Māori non-Pacific babies were born to mothers who were non-smokers both at first registration with a LMC and two weeks after their babies were born, and 6.1% of non-Māori non-Pacific babies were born to mothers who were smokers both at first registration with a LMC and two weeks after their babies were born (**Table 39**).

Table 39. Smoking status of the mothers of babies born in New Zealand, by ethnicity, 2008–2012

Maternal smoking status at:		Number: total 2008−2012	Number: annual average	Percent
first registration with LMC	two weeks postnatal			
Babies with mother registered with a LMC at delivery in New Zealand				
Māori babies				
Non-smoker	Non-smoker	40,867	8,173.4	56.9
	Smoker	1,811	362.2	2.5
	Not known	2,136	427.2	3.0
Smoker	Non-smoker	3,505	701.0	4.9
	Smoker	21,727	4,345.4	30.3
	Not known	1,735	347.0	2.4
Not known	Non-smoker	10	2.0	0.0
	Smoker	3	0.6	0.0
	Not known	4	0.8	0.0
Total		71,798	14,359.6	100.0
non-Māori non-Pacific babies				
Non-smoker	Non-smoker	153,166	30,633.2	87.7
	Smoker	1,045	209.0	0.6
	Not known	6,507	1,301.4	3.7
Smoker	Non-smoker	2,246	449.2	1.3
	Smoker	10,716	2,143.2	6.1
	Not known	910	182.0	0.5
Not known	Non-smoker	26	5.2	0.0
	Smoker	4	0.8	0.0
	Not known	13	2.6	0.0
Total		174,633	34,926.6	100.0

Source: National Maternity Collection; Note: Information is for babies born to mothers registered with a LMC at delivery; Smokers are classified as mothers who indicated 'Y' to smoking or stated the number of cigarettes

New Zealand distribution by ethnicity and DHB

In New Zealand during 2008–2012, the proportion of Māori babies with a mother who was registered with a lead maternity carer and a smoker (at either first registration or at two weeks post-natal) varied by DHB, from 23.0% in Auckland to 49.4% in the Bay of Plenty (**Table 40**). The proportion of Māori babies with a mother who was registered with a Lead Maternity Carer and a smoker (at either first registration or at two weeks post-natal) was *significantly* higher than the New Zealand average for Māori babies in Northland, Waikato, Bay of Plenty, Lakes, Tairawhiti, Hawke's Bay, MidCentral and South Canterbury DHBs, and *significantly* lower in Waitemata, Auckland, Hutt Valley, Capital and Coast, Nelson Marlborough, Canterbury, West Coast and Southern DHBs (**Table 40**).

Table 40. Māori babies born to mothers registered with a Lead Maternity Carer at delivery, by maternal smoking status, DHBs vs. New Zealand 2008−2012

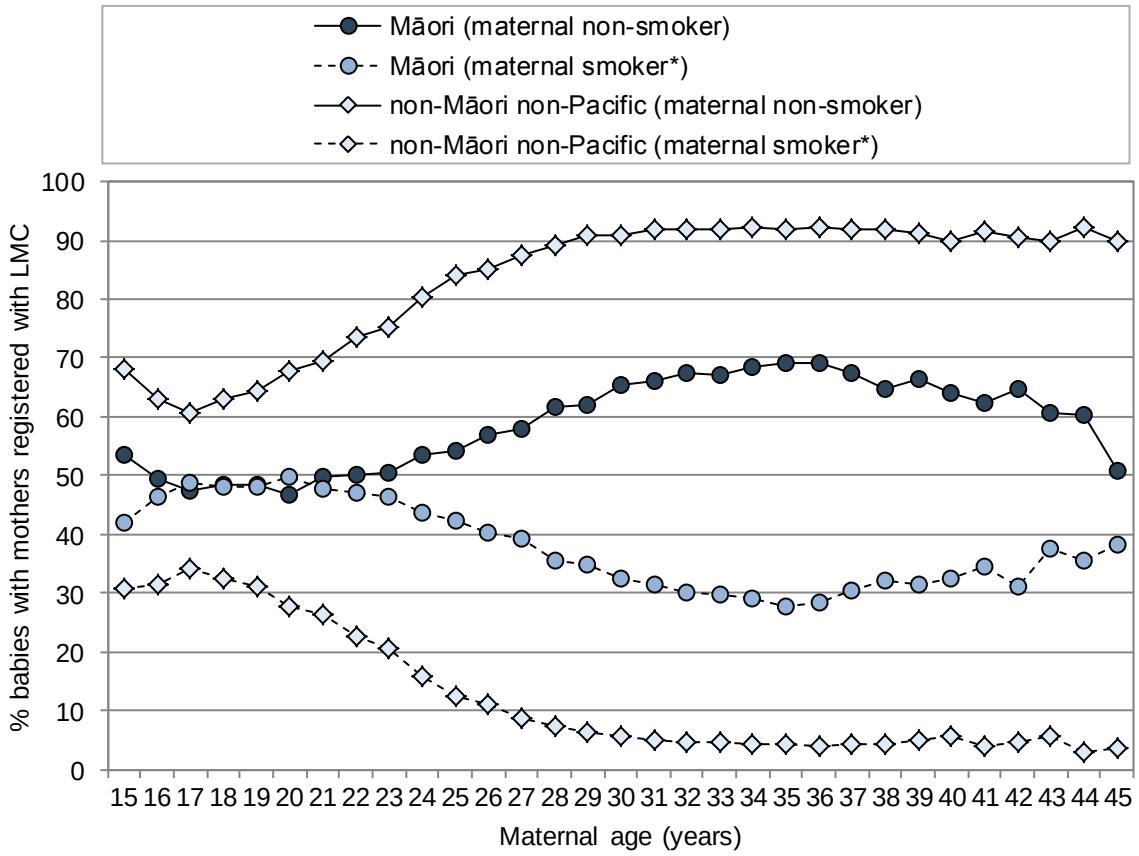
District Health Board	Number of Māori babies: total 2008−2012			Per cent of Māori babies with maternal smoker	Rate ratio	95% CI
	Maternal smoker	Maternal non-smoker	Total			
Māori babies with mothers registered with a LMC at delivery						
Northland	2,092	2,589	4,916	42.6	1.06	1.03–1.10
Waitemata	1,851	4,135	6,199	29.9	0.74	0.72–0.77
Auckland	695	2,198	3,018	23.0	0.57	0.54–0.61
Counties Manukau	2,818	3,903	6,945	40.6	1.01	0.98–1.04
Waikato	3,882	5,200	9,253	42.0	1.05	1.02–1.07
Bay of Plenty	3,193	3,179	6,458	49.4	1.23	1.20–1.27
Lakes	1,841	2,152	4,084	45.1	1.12	1.09–1.16
Tairawhiti	1,270	1,297	2,665	47.7	1.19	1.14–1.24
Taranaki	1,051	1,313	2,465	42.6	1.06	1.02–1.11
Hawke's Bay	1,997	2,258	4,494	44.4	1.11	1.07–1.15
MidCentral	1,457	1,924	3,456	42.2	1.05	1.01–1.09
Whanganui	584	628	1,268	46.1	1.15	1.08–1.22
Hutt Valley	966	1,578	2,654	36.4	0.91	0.86–0.96
Capital & Coast	1,035	2,183	3,311	31.3	0.78	0.74–0.82
Wairarapa	286	404	716	39.9	1.00	0.91–1.09
Nelson Marlborough	439	771	1,246	35.2	0.88	0.81–0.95
South Canterbury	199	200	416	47.8	1.19	1.08–1.32
Canterbury	1,705	2,822	4,600	37.1	0.92	0.89–0.96
West Coast	38	87	144	26.4	0.66	0.50–0.86
Southern	1,224	1,871	3,135	39.0	0.97	0.93–1.02
New Zealand	28,781	40,867	71,798	40.1	1.00	

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

New Zealand distribution by ethnicity and maternal age

In New Zealand during 2008–2012, the proportion of Māori babies who had smoking mothers was highest for babies born to mothers aged in their late teens and early 20s and lowest for babies born to mothers aged in their mid-30s.The proportion of Māori babies with smoking mothers was higher than the proportion of Non-Māori non-Pacific babies with smoking mothers for all maternal ages (**Figure 74**).

Figure 74. Maternal smoking status of babies born in New Zealand, by maternal age and ethnicity 2008−2012



Source: National Maternity Collection; Note: Information is for babies born to mothers registered with a LMC at delivery; *Smokers are mothers smoking at first LMC registration and/or at two weeks postnatal for that baby

SECOND-HAND CIGARETTE SMOKE EXPOSURE

Introduction

The following section uses data from the 1996, 2006, and 2013 Censuses to review the proportion of Māori children who lived in a household with a smoker.

Background

Beginning before birth, there are adverse health effects for children exposed to second-hand smoke. Children who are exposed to second-hand smoke have higher rates of sudden infant death, respiratory infections, wheeze and asthma, middle ear infections and meningitis [138]. It has been estimated that, in New Zealand each year, second-hand smoke exposure contributes to approximately 15,000 episodes of childhood asthma, more than 27,000 medical consultations for childhood respiratory problems and 1,500 operations to treat glue ear [139]. In New Zealand, as in other developed countries, as smoking rates in the general population have fallen, smoking has increasingly become concentrated in the most socio-economically disadvantaged sections of society [140]. Exposure to second-hand smoke is likely to be a significant contributor to socio-economic disparities in rates of many common childhood illnesses [138]. Children who grow up in smoking households are more likely than other children to grow up to be smokers [141].

The most recent New Zealand Tobacco Use Survey (2009) found that Māori households with children were significantly more likely to report that a resident had smoked inside the house than European/Other households. The 2010 National Year 10 ASH Snapshot Survey of tobacco use by students aged 14–15 years found that 62.7% of Māori students reported that one or both of their parents smoked (compared to 65.9% in 2001) and 31.7% of Māori students reported that people smoked inside their home (compared to 47.5% in 2001) [142]. Māori students were almost twice as likely as European students to report that a parent smoked.

Census Data

At the 1996, 2006, and 2013 Censuses, respondents aged 15 years or older were asked “Do you smoke cigarettes regularly (that is one or more per day)? This section considers the proportion of children aged 0–14 years who live in a household with someone who answered yes to this question.

Data Source and Methods

Indicator

Proportion of children aged 0–14 years who lived in a household with a smoker

Numerator: Number of children aged 0–14 years who lived in a household with someone who answered yes to the Census question “Do you smoke cigarettes regularly (that is one or more per day)?”

Denominator: The number of children aged 0–14 years at the 1996, 2006, and 2013 Censuses who lived in a household

Data Source

1996, 2006, and 2013 Censuses

Notes on Interpretation

Note 1: Census data categorises those aged 15 or more years into two groups: smokers and non-smokers, with missing responses in this analysis being assigned to the non-smoking category. Thus this data may underestimate the proportion of children living in a household with a smoker.

Note 2: Differences in the way ethnicity questions were structured between the 1996 and 2001 Censuses mean that ethnic specific rates for these two periods may not be strictly comparable. This must be kept in mind when interpreting the figures in this section.

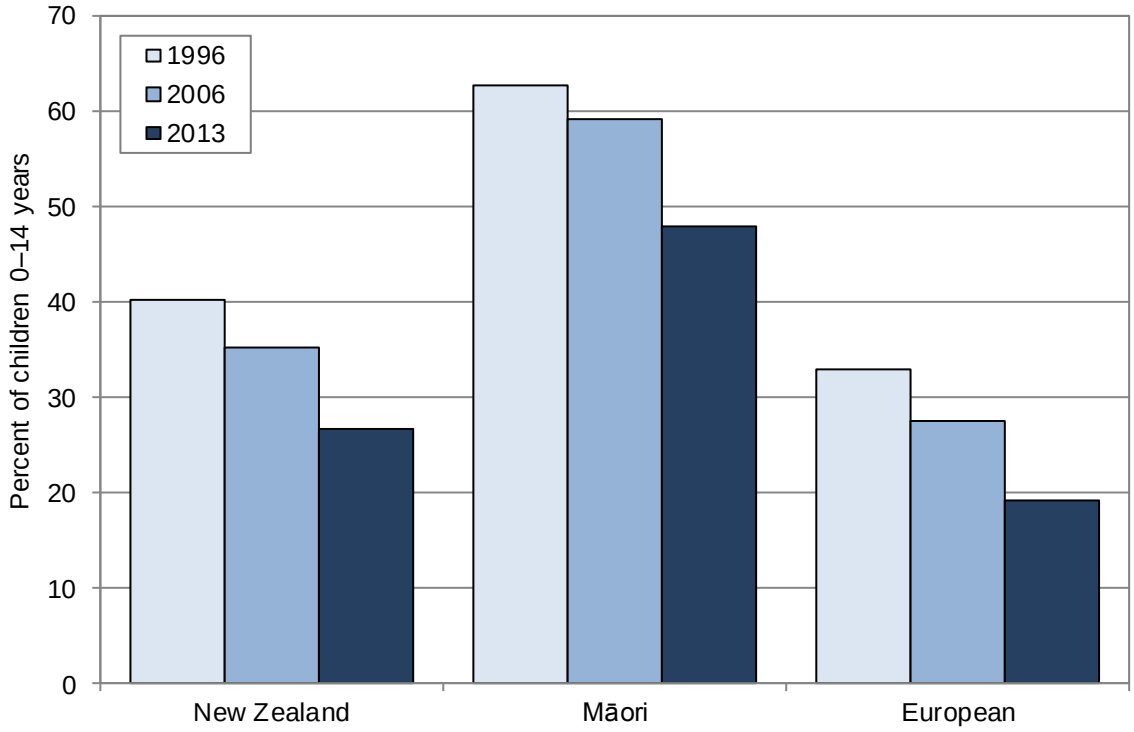
New Zealand trends

In New Zealand, the proportion of children living in a household with a smoker declined from 40.2% in 1996 to 26.7% in 2013 (**Figure 75**).

New Zealand trends by ethnicity

At the 2013 Census, 48.0% of Māori children lived in a household with a smoker, compared to 19.1% of European children (**Figure 75**). The proportion of children living in a household with a smoker declined for both ethnic groups between 1996 and 2013 (**Figure 75**).

Figure 75. Proportion of children aged 0–14 years living in a household with a smoker by ethnicity, New Zealand at the 1996, 2006, and 2013 Censuses



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

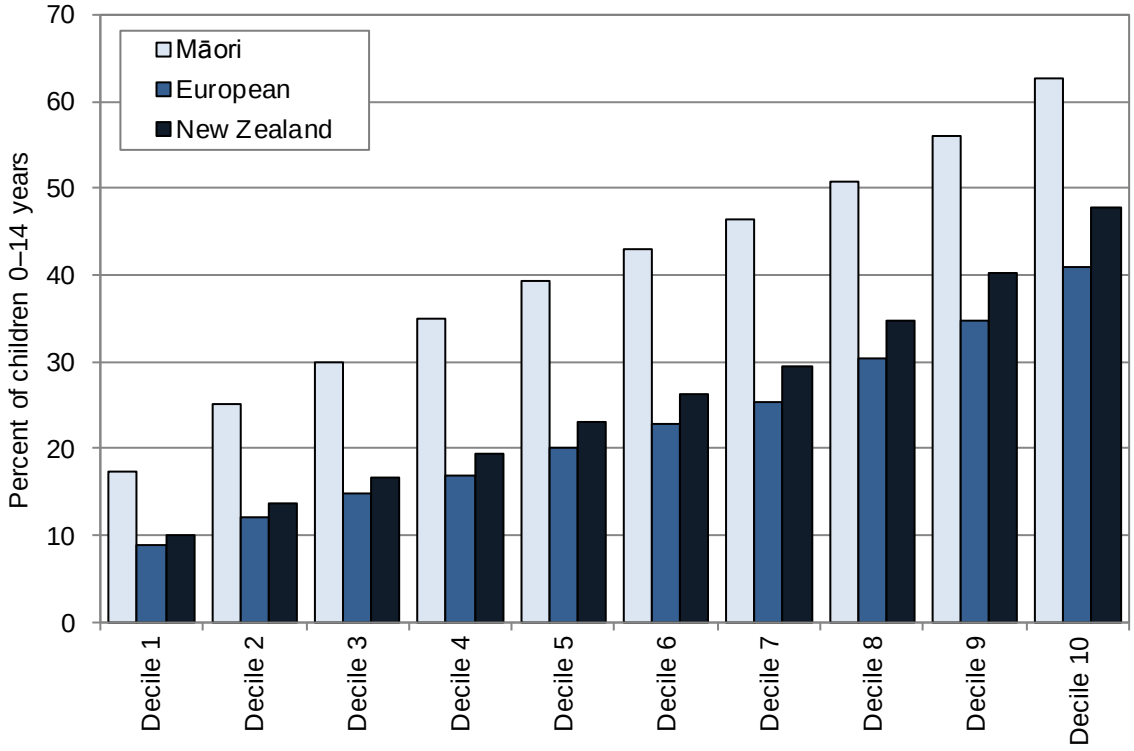
Distribution by NZ Deprivation Index decile

At the 2013 Census, the proportion of children living in a household with a smoker increased from 9.9% for those in the least deprived areas (NZDep decile 1) to 47.7% for those in the most deprived areas (NZDep decile 10) (**Figure 76**, **Table 41**). During this period, rates for children in the most deprived areas were 4.81 (95% CI 4.71–4.91) times higher than for those in the least deprived areas (**Table 41**).

Distribution by ethnicity and deprivation

At the 2013 Census, the proportion of Māori children living in a household with a smoker increased from 17.3% for those in the least deprived areas (NZDep decile 1) to 62.6% for those in the most deprived areas (NZDep decile 10). In the same period, the proportion of European children living in a household with a smoker increased from 8.9% for those in the least deprived areas to 41.0% for those in the most deprived areas. At all levels of deprivation, the proportion of Māori children living in households with a smoker was higher than the proportion of non-Māori non-Pacific children (**Figure 76**).

Figure 76. Proportion of children aged 0–14 years living in a household with a smoker by ethnicity and NZ Deprivation Index decile, New Zealand at the 2013 Census



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

Table 41. Children aged 0–14 years living in a household with a smoker by ethnicity and NZ Deprivation Index decile, New Zealand at the 2013 Census

Variable	Number of young people	Percent of young people	Rate ratio	95% CI
Young people aged 15–24 years who were regular smokers				
Ethnicity				
Māori	30,216	28.2	2.20	2.17–2.23
European	39,423	12.8	1.00	
NZ Deprivation Index decile				
Decile 1	3,201	6.5	1.00	
Decile 2	4,404	8.4	1.30	1.25–1.36
Decile 3	5,100	9.8	1.52	1.46–1.58
Decile 4	6,057	11.5	1.78	1.71–1.85
Decile 5	7,122	12.9	1.98	1.91–2.06
Decile 6	7,803	13.9	2.14	2.06–2.23
Decile 7	8,925	15.0	2.31	2.22–2.40
Decile 8	10,908	16.4	2.53	2.43–2.62
Decile 9	13,095	18.2	2.80	2.70–2.91
Decile 10	16,260	23.1	3.55	3.43–3.68

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

TOBACCO USE IN YOUNG PEOPLE

Introduction

The following section uses data from the 1996, 2006, and 2013 Censuses to review the proportion of Māori young people aged 15–24 years who were regular smokers. This section also uses the Action on Smoking and Health (ASH) survey data to review the prevalence of smoking in Year 10 (aged 14–15 years) Māori secondary school students and the 2012/13 New Zealand Health Survey to describe the prevalence of daily smoking amongst Māori young people aged 15–24 years.

Background

Tobacco smoking is the leading cause of preventable and premature death and a significant contributor to ethnic and socioeconomic disparities in health, both in New Zealand and internationally [143,144]. Most adult smokers started smoking in adolescence. Only one percent of smokers had their first cigarette after age 25 [144]. While many of the serious health consequences of smoking, such as lung cancer and heart disease, tend to affect older people, there are health consequences for young smokers. The US Surgeon General's 2012 report *Preventing tobacco use among youth and young adults* [144] concluded that there was sufficient evidence that smoking caused nicotine addiction beginning in adolescence and young adulthood, reduced lung function and lung growth during childhood and adolescence, and led to early abdominal atherosclerosis in young adults. The report found that the evidence suggested that smoking contributes to future use of marijuana and other illicit drugs and coronary atherosclerosis in adulthood and that smoking is not associated with weight loss.

Action on Smoking and Health New Zealand (ASH) has been monitoring year 10 student smoking since 1999. Māori youth smoking rates have declined almost every year since but Māori students still have the highest prevalence of daily smoking of any ethnic group. Findings from the New Zealand Year 10 survey in 2002 indicated that young people were more likely to smoke on a daily basis if their parents smoked (especially if both parents did), if they had pocket money of more than $5 per week and if their best friend smoked [145]. The 2006 New Zealand Year 10 survey found that exposure to second-hand smoke and lack of parental anti-smoking expectations were independently associated with smoking susceptibility and current smoking, and that receiving pocket money, and a lack of monitoring of expenditure were associated with smoking susceptibility and current smoking. Findings were similar whether or not one or more parents were smokers [146].

Census Data

Data Source and Methods

Definition

Proportion of young people aged 15–24 years who were regular smokers

Data Source

Numerator: NZ Census: The number of young people aged 15–24 years who answered "yes" to the Census question "Do you smoke cigarettes regularly (that is one or more per day)?"

Denominator: NZ Census: The number of young people aged 15–24 years who were home on Census night

Notes on Interpretation

Note 1: Census data categorises those aged 15–24 years into two groups: smokers and non-smokers, with missing responses in this analysis being assigned to the non-smoking category. These data may, therefore, underestimate the proportion of smokers in this age group.

Note 2: Differences in the way ethnicity questions were structured between the 1996 and 2001 Censuses mean that ethnic specific rates for these two periods may not be strictly comparable. This must be kept in mind when interpreting the figures in the section which follows.

New Zealand distribution and trends

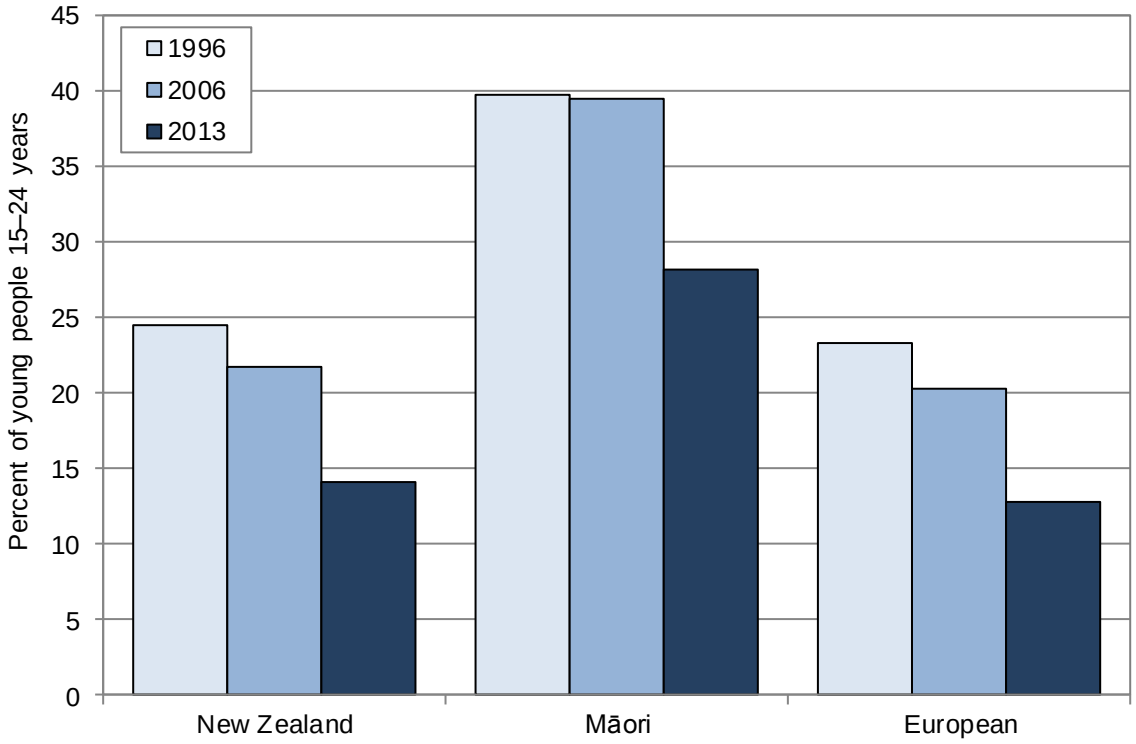
New Zealand trends

In New Zealand, the proportion of young people who were regular smokers declined from 24.5% in 1996 to 14.1% in 2013 (**Figure 77**).

New Zealand trends by ethnicity

At the 2013 Census, 28.2% of Māori young people were regular smokers, as compared to 12.8% of European young people (**Figure 77**). The proportion of young people who were regular smokers declined for both ethnic groups from 1996 to 2013 (**Figure 77**).

Figure 77. Proportion of young people aged 15–24 years who were regular smokers by ethnicity, New Zealand at the 1996, 2006 and 2013 Censuses



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

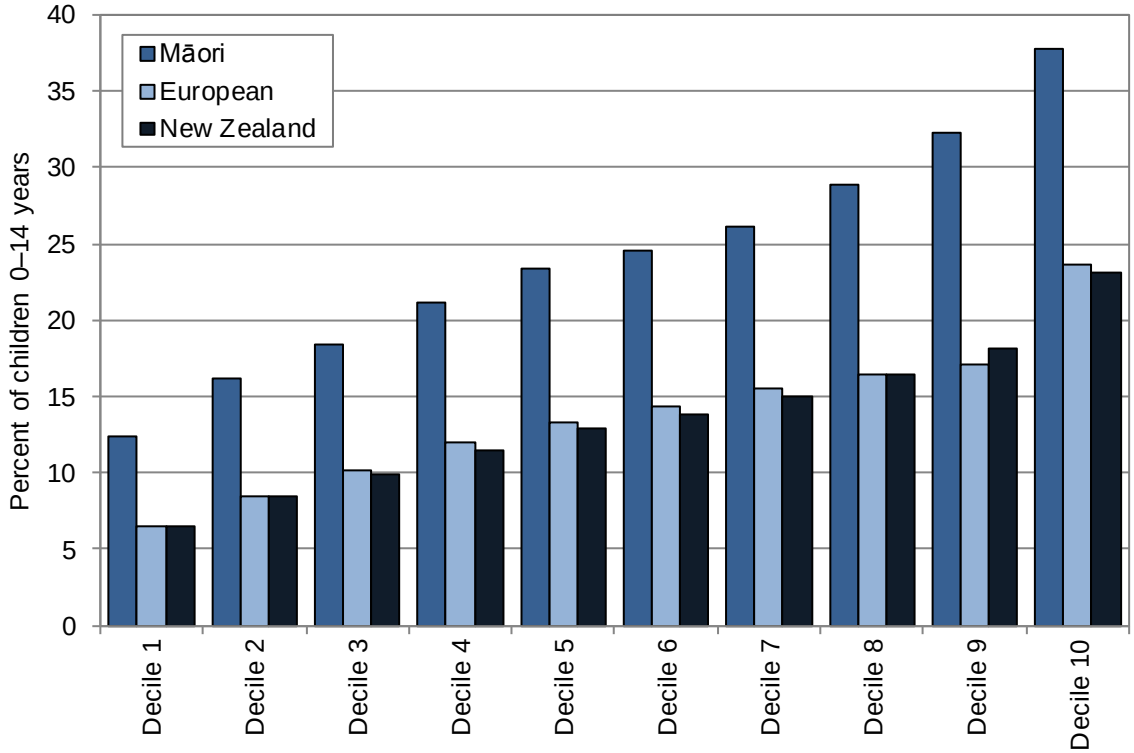
Distribution by NZ Deprivation Index decile

At the 2013 Census, the proportion of all New Zealand young people aged 15–24 years who were regular smokers increased with increasing deprivation, from 6.5% in the least deprived areas (NZDep decile 1) to 23.1% in the most deprived areas (NZDep decile 10) (**Figure 78**, **Table 42**). During this period, the proportion of young people aged 15–24 years who were regular smokers in the most deprived areas was *significantly higher* than in the least deprived areas (RR 3.55, 95% CI 3.43–3.68) (**Table 42**).

Distribution by ethnicity and NZ Deprivation Index decile

At the 2013 Census, the proportion of Māori young people who were regular smokers increased from 12.4% for those in the least deprived areas (NZDep decile 1) to 37.7% for those in the most deprived areas (NZDep decile 10). The proportion of European young people who were regular smokers increased from 6.5% for those in the least deprived areas to 23.6% for those in the most deprived areas. At each level of deprivation, a higher proportion of Māori young people than European young people were regular smokers (**Figure 78**).

Figure 78. Proportion of young people aged 15–24 years who were regular smokers by ethnicity and NZ Deprivation Index decile, New Zealand at the 2013 Census



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

Table 42. Young people aged 15–24 years who were regular smokers by ethnicity and NZ Deprivation Index decile, New Zealand at the 2013 Census

Variable	Number of young people	Percent of young people	Rate ratio	95% CI
Young people aged 15–24 years who were regular smokers				
Ethnicity				
Māori	30,216	28.2	2.20	2.17–2.23
European	39,423	12.8	1.00	
NZ Deprivation Index decile				
Decile 1	3,201	6.5	1.00	
Decile 2	4,404	8.4	1.30	1.25–1.36
Decile 3	5,100	9.8	1.52	1.46–1.58
Decile 4	6,057	11.5	1.78	1.71–1.85
Decile 5	7,122	12.9	1.98	1.91–2.06
Decile 6	7,803	13.9	2.14	2.06–2.23
Decile 7	8,925	15.0	2.31	2.22–2.40
Decile 8	10,908	16.4	2.53	2.43–2.62
Decile 9	13,095	18.2	2.80	2.70–2.91
Decile 10	16,260	23.1	3.55	3.43–3.68

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

ASH Year 10 Survey

The Year 10 ASH Smoking Survey has been used to monitor smoking in New Zealand 14 and 15 year old students since 1999. The survey samples around half of the secondary schools with Year 10 students and sample sizes typically exceed 25,000 students each year [147]. The results reflect the smoking behaviour of secondary school students aged 14 and 15 years, and are useful for understanding smoking trends and risk factors for smoking initiation.

Data Source and Methods

Definition

1. Proportion of Year 10 students who are daily smokers
2. Proportion of Year 10 students who have never smoked

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

Notes on Interpretation

Note 1: Action on Smoking and Health (ASH) was established in 1982 with the aim of reducing smoking and smoking-related premature deaths. While the Ministry of Health provides funding for the annual national Year 10 Smoking Survey, ASH manages the data collection and oversees its analysis [147]. 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 [148].

Note 3: In 2000 and 2001, over 70% of schools in NZ participated and within these schools, 70% of enrolled students took part [149]. 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 students at low decile schools were underrepresented in the survey. This underrepresentation is likely to have systematically biased the results of later surveys, so that the proportion of young people living with parents who smoke, or in a home with smoking inside, is likely to have been increasingly under-estimated in these figures [150].

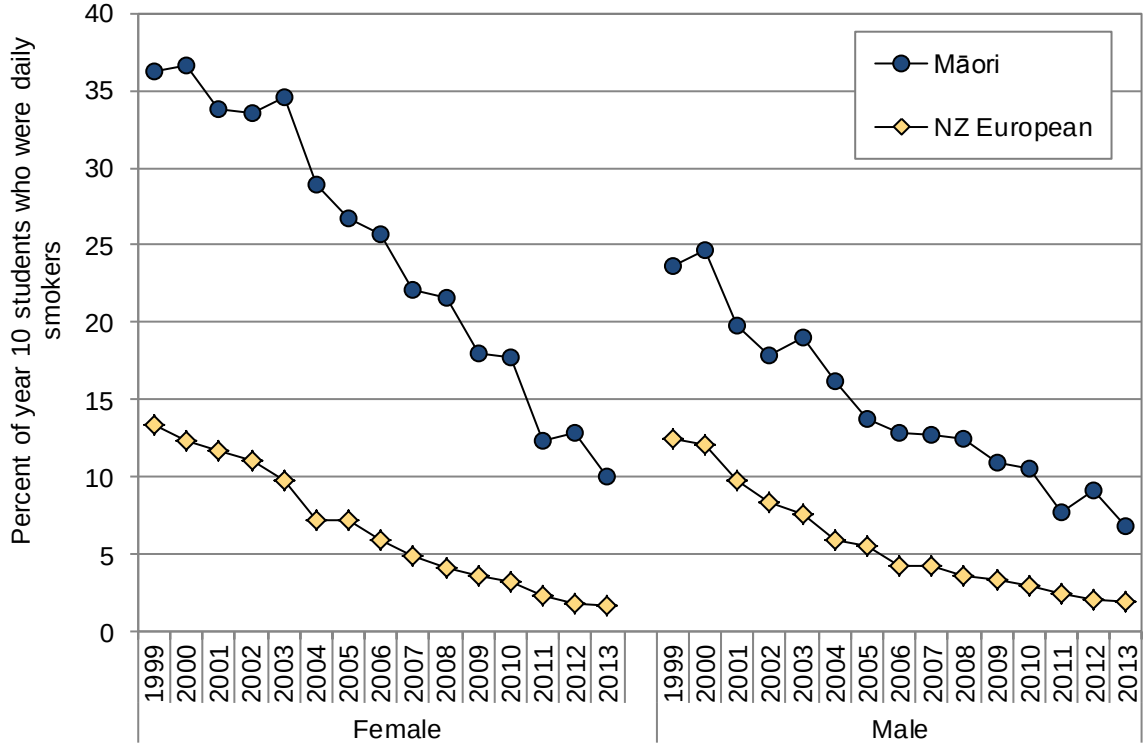
Note 4: The data presented in this section are based on the estimates for the whole population based on the Year 10 sample as reported by ASH, and are available from http://www.ash.org.nz/

New Zealand distribution and trends

Trends by gender and ethnicity

In New Zealand during 1999–2013, daily smoking rates for Māori students were higher for females than for males. For European students, female smoking rates were higher than male rates from 1999–2010, but lower from 2011–2013. The proportions of Māori students who smoked daily were consistently higher than the proportions of European students who smoked, both for males and for females Daily smoking rates declined for students of both ethnic groups during 1999–2013. For Māori female students, the rates fell from 36.3% in 1999 to 10.1% in 2013, and for Māori male students from 23.6% to 6.9%. For European female students, the rates fell from 13.4% in 1999 to 1.7% in 2013, and for European male students from 12.5% to 1.9% (**Figure 79**).

Figure 79. Proportion of Year 10 students who were daily smokers by gender and ethnicity, New Zealand 1999–2013



Source: ASH Year 10 surveys; Note: ethnicity is prioritised

ALCOHOL-RELATED HOSPITAL ADMISSIONS

Introduction

The following section explores alcohol-related hospital admissions in Māori young people aged 15−24 years. This section serves to identify the tip of the iceberg in terms of the contribution alcohol makes to hospital admissions in this age group and the following analyses are likely to be an undercount due to regional variations in coding and the fact that many alcohol-related issues are dealt with in the Emergency Department (ED) setting. (For more detail on this issue refer to the Methods box.)

Background

Alcohol is New Zealand's most widely used recreational drug. It causes harm through toxicity, intoxication and dependence. The way a person drinks is a key determinant of their risk of suffering harm from their alcohol consumption. Both intermittent heavy drinking (binge drinking) and frequent drinking episodes are hazardous to health and wellbeing [151]. Long term harm from excessive alcohol intake over many years includes conditions entirely attributable to alcohol, such as alcohol dependence syndrome and alcoholic liver disease. There are also more than 200 other diseases and conditions for which alcohol is a component cause in that it increases the risk of a person developing the condition via a dose-response relationship. These conditions include many types of cancer, depression, and dementia [152]. Short term risks associated with acute alcohol intoxication are often relevant to young people. These include injury, risky sexual behaviour leading to sexually transmitted infections and/or pregnancy, being the victim or perpetrator of assault or sexual violence, and use of other psychoactive substances [153].

The latest New Zealand Health Survey (2012/13) found that a quarter of all young people aged 15−24 years engaged in hazardous drinking, compared to 35% in the 2006/07 survey [154]. The Youth '07 survey (of 9,107 secondary school students) found that Māori had the highest proportion of students reporting binge drinking in the previous four weeks: 51.0% (compared to 35.6% of European students) [155]. A study using the Youth '07 data to investigate the factors and outcomes associated with patterns of alcohol use among Māori secondary school students found that Māori students had high levels of binge drinking and heavy binge drinking and that the factors associated with binge drinking included believing that 'drinking alcohol is okay for people my age', having friends who drink alcohol, obtaining alcohol from friends and 'other adults' and being able to purchase one's own alcohol [156].

Data Source and Methods

Indicator

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

Numerator: National Minimum Dataset (NMDS): Hospital admissions with an ICD-10-AM alcohol-related diagnosis in any of their first 15 diagnostic codes (F10 mental and behavioural disorders due to alcohol, T51 toxic effects of alcohol) or first 10 external cause codes (X45 accidental poisoning by/ exposure to alcohol, X65 intentional self-poisoning by/exposure to alcohol, Y15 poisoning by/exposure to alcohol of undetermined intent, Y90–91 evidence of alcohol involvement determined by blood alcohol level or level of intoxication).

Denominator: Statistics NZ estimated resident population

Notes on Interpretation

Note 1: As alcohol is often coded as a secondary cause (e.g. in a traffic crash, alcohol will only be listed after the primary diagnosis (e.g. fractured femur) and external cause (e.g. vehicle occupant in transport accident) have been recorded), the following section includes all admissions where alcohol was listed in any of the first 15 diagnoses or 10 external causes of injury.

Note 2: It is likely that the figures presented reflect a considerable undercount as a result of regional differences in the extent to which:

1) clinicians document alcohol as a contributory cause of admission; or
2) coders code alcohol-related diagnoses over and above those associated with the primary diagnosis and first external cause of injury code.

In this context, a 2000 study of the role alcohol played in injury attendances at an Auckland emergency department noted 35% of injured patients had consumed alcohol prior to their injury [157]. In contrast, an analysis of New Zealand ED cases for the period 2000–2005 using the NMDS found that only 10.3% of injury cases in young people 15–24 years had any mention of alcohol, while 4.5% of injury cases admitted beyond the ED (the group reviewed in this section) had alcohol as a listed cause. This suggests that the figures in this section are likely to significantly underestimate the contribution alcohol makes to hospital admissions in this age group.

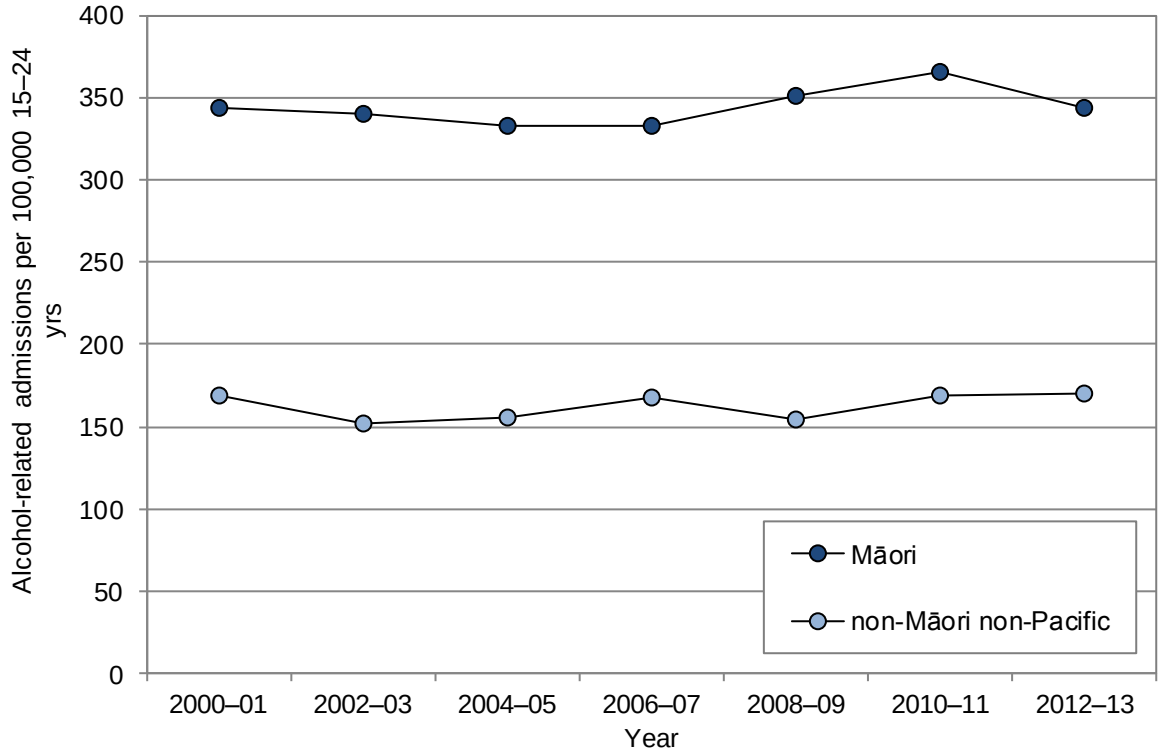
Note 3: Due to inconsistent uploading of ED cases to the NMDS, all admissions with an ED specialty code on discharge have been excluded (see **Appendix 2** for a more detailed discussion of this issue). While this filtering is likely to remove a large number of alcohol-related cases, it has been undertaken with a view to enhancing the comparability of admission rates across DHBs.

New Zealand distribution and trends

New Zealand trends by ethnicity

In New Zealand during 2000–2013, rates of identified alcohol-related hospital admissions in Māori young people were relatively static. While on average 344 such admissions occurred per year, it is likely that this reflects a significant undercount, as identification relies on hospital staff at the time of discharge listing alcohol as a contributory cause, as well as coders assigning alcohol-related diagnoses in cases where alcohol contributed to, but was not the sole reason for, admission. On average, during 2000–2013, the Māori alcohol-related admission rate was *significantly higher* than (approximately double) the non-Māori non-Pacific rate (
Figure 80**, Table 43**).

Figure 80. Alcohol-related hospital admissions in young people aged 15–24 years by ethnicity, New Zealand 2000–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population; Note: admissions are those with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; emergency department cases have been removed

Table 43. Alcohol-related hospital admissions in young people aged 15–24 years by ethnicity, New Zealand 2009–2013

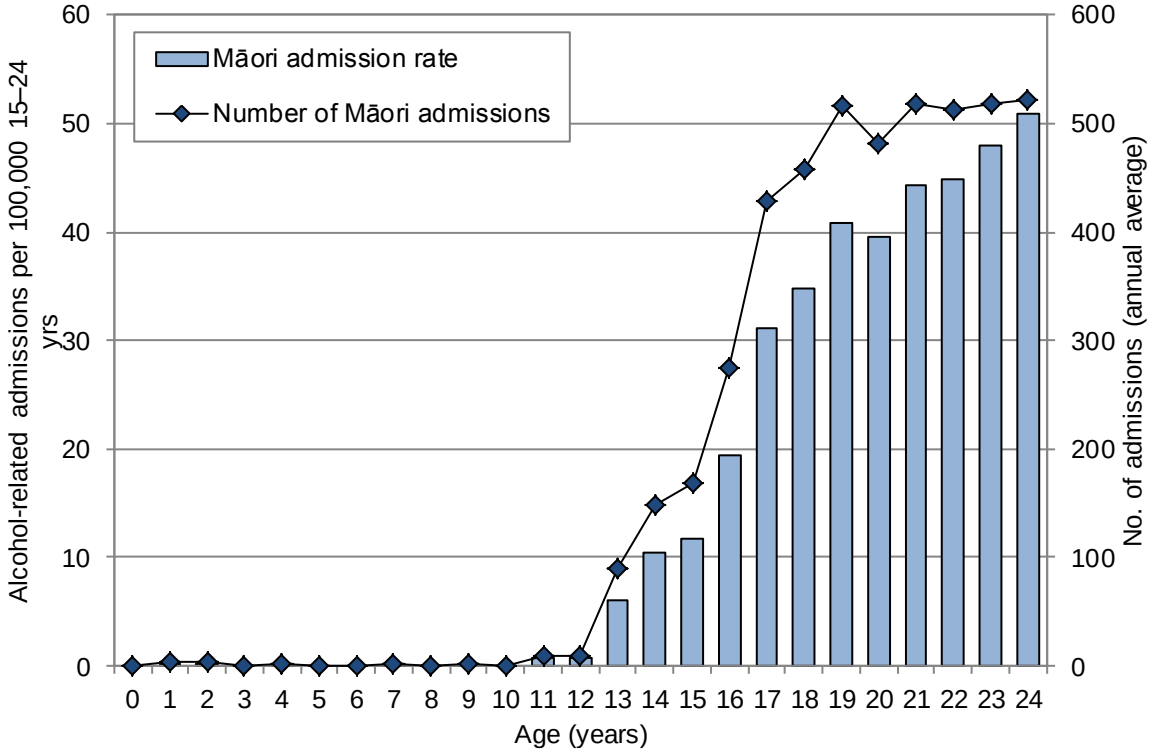
Ethnicity	Number: total 2009−2013	Number: annual average	Rate	Rate ratio	95% CI
Māori young people aged 15–24 years					
Alcohol-related hospital admissions					
Māori	2,198	439.6	353.3	2.14	2.03–2.26
non-Māori non-Pacific	3,665	733.0	165.0	1.00	

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population; Note: admissions are those with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; emergency department cases have been removed

Distribution by age

In New Zealand during 2009–2013, there were very few alcohol-related hospital admissions in Māori children aged less than 13 years. The alcohol-related admissions rate for Māori young people increased with increasing age from the age of 13 years (**Figure 81**).

Figure 81. Alcohol-related hospital admissions in Māori children and young people aged 0–24 years by age and gender, New Zealand 2009–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population; Note: admissions are those with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; emergency department cases have been removed

New Zealand distribution by primary diagnosis

In New Zealand during 2009–2013, alcohol was listed as a contributory cause in a considerable number of hospital admissions in Māori young people. However, only 10.2% of these admissions had acute intoxication or the toxic effects of alcohol listed as the primary diagnosis. In 43.8% of cases an injury was the primary diagnosis, with head and upper limb injuries being particularly common.

In addition, 34.7% of admissions had a mental health condition (including alcohol dependence) listed as the primary diagnosis. Schizophrenia and other schizotypal and delusional disorders were the most frequent mental health diagnoses recorded. Poisoning by drugs, medicines, or substances was listed as the primary reason in 8.1% of admissions (**Table 44**).

Care is required with interpreting these figures. Due to inconsistent uploading of emergency department (ED) cases to the National Minimum Dataset, ED cases have been removed. These figures, therefore, reflect the more severe end of spectrum as it is likely that many cases of acute intoxication or minor injury were dealt with in the ED setting.

Table 44. Alcohol-related hospital admissions in young people aged 15–24 years by ethnicity, New Zealand 2009–2013

Primary diagnosis	Number: total 2009−2013	Number: annual average	Rate per 100,000	Percent of admissions
Māori young people aged 15–24 years				
Mental and behavioural disorders				
Alcohol: acute intoxication	117	23.4	18.81	5.3
Alcohol: other mental/behavioural disorders	54	10.8	8.68	2.5
Alcohol: dependence	32	6.4	5.14	1.5
Schizophrenia	240	48.0	38.58	10.9
Other schizotypal and delusional disorders	164	32.8	26.36	7.5
Reaction to stress/adjustment disorder	81	16.2	13.02	3.7
Depression/other mood disorders	103	20.6	16.56	4.7
Bipolar affective disorder	48	9.6	7.72	2.2
Other mental and behavioural disorders	126	25.2	20.25	5.7
Gastrointestinal system				
Gastritis/upper gastrointestinal bleeding	52	10.4	8.36	2.4
Other gastrointestinal conditions	31	6.2	4.98	1.4
Injury and poisoning				
Head injury	250	50.0	40.19	11.4
Neck injury	27	5.4	4.34	1.2
Shoulder/upper arm injuries	39	7.8	6.27	1.8
Elbow/forearm injuries	130	26.0	20.90	5.9
Wrist/hand injuries	112	22.4	18.00	5.1
Lower limb injuries	98	19.6	15.75	4.5
Poisoning (drugs/biological substances)	179	35.8	28.77	8.1
Toxic effect of alcohol	23	4.6	3.70	1.0
Other injuries	104	20.8	16.72	4.7
All other diagnoses				
Other conditions	188	37.6	30.22	8.6
Total alcohol-related admissions	2,198	439.6	353.32	100.0

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population; Note: admissions are those with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; emergency department cases have been removed

HEALTH OUTCOMES AS DETERMINANTS

SOCIOECONOMICALLY SENSITIVE HOSPITALADMISSIONS AND MORTALITY

HOSPITAL ADMISSIONS AND MORTALITY WITH A SOCIAL GRADIENT

Introduction

This section reports on hospital admission rates and mortality rates for medical conditions and injuries for which there is a social gradient, using data from the National Minimum Dataset and the National Mortality Collection, for Māori children aged 0–14 years.

Background

In New Zealand, there are currently large disparities in many measures of child health status between children belonging to different socio-economic groups within the population, and between Māori children and children of other ethnicities. Ethnic and/or socioeconomic disparities among children have been observed in rates of skin infections [158], asthma [159], rheumatic fever [160], road traffic crashes [161], meningitis [162], unintentional injuries [163] burns [164], overall mortality, and mortality from injury (both road and non-road traffic injury) [165] and sudden infant death syndrome [166].

The higher hospital admission rates for infectious and respiratory diseases for children in socioeconomically disadvantaged families can be readily understood to arise from poor living conditions: poor quality housing, especially housing that is cold and damp, overcrowded living spaces which facilitate the spread of infection, and inability to pay for adequate heating, nutritious food, and the costs associated with accessing medical care. Since infectious and respiratory diseases are among the most common reasons why children are admitted to hospital, if the infectious disease admission rates of the most deprived children became equal to those of the least deprived children there could be substantial savings for the hospital sector. The causes of socio-economic disparities in admission rates for other medical conditions and for injuries may be less obvious but these disparities undoubtedly exist, and have been well documented, both in New Zealand and in other countries [167-169].

Data Source and Methods

Indicators

1. *Hospital admissions for medical conditions and injuries with a social gradient in children aged 0–14 years*
2. *Mortality from medical conditions and injuries with a social gradient and sudden unexpected death in infancy (SUDI) in children aged 0–14 years*

Data source

Numerator:

Hospital admissions for medical conditions with a social gradient: acute and arranged (arranged = within 7 days of referral) hospital admissions (waiting-list cases and neonates <28 days excluded) with the following ICD-10-AM primary diagnoses: A00–A09, R11, K529 (gastroenteritis); A15–A19 (tuberculosis); A33, A34, A35, A36, A37, A80, B05, B06, B16, B26, B18.0, B18.1, P35.0 or M01.4 (vaccine preventable diseases); A39 (meningococcal disease); B34 (viral infection of unspecified site); E40–E64 or D50–D53 (nutritional deficiencies/anaemias); J00–J03 orJ06 (acute upper respiratory infections); J04 (croup/laryngitis/tracheitis/ epiglottitis); J12, J10.0 or J11.0 (pneumonia: viral); J13–J16 or J18 (pneumonia: bacterial, non-viral, unspecified); J21 (acute bronchiolitis); J22 (acute lower respiratory infection unspecified); J45–J46, R062 (asthma and wheeze); J47 (bronchiectasis); G00–G01 (meningitis: bacterial); A87, G02 or G03 (meningitis: viral, other, NOS); G40 or G41 (epilepsy or status epilepticus); H65, H66 or H67 (otitis media); I00–I09 (rheumatic fever/heart disease); K40 (inguinal hernia); L00–L08, H00.0, H01.0, J34.0 or L98.0 (skin infections); L20–L30 (dermatitis and eczema); M86 (osteomyelitis); N10, N12, N13.6, N30.0, N30.9 or N39.0 (urinary tract infection); R56.0 (febrile convulsions).

Injury admissions with a social gradient: hospital admissions (emergency department cases, neonates <28 days excluded) with a primary diagnosis of injury (ICD-10-AM S00–T79) and an ICD-10-AM primary external cause code in the following range: V01–V09 (transport: pedestrian); V10–V19 (transport: cyclist); V40–V79 (transport: vehicle occupant); W00–W19 (falls); W20–W49 (mechanical forces: inanimate); W50–W64 (mechanical forces: animate); W85–X19 (thermal injury); X40–X49 (poisoning). In order to ensure comparability over time, all injury cases with an Emergency Department specialty code (M05–M08) on discharge were excluded.

Mortality from conditions with a social gradient: all deaths (neonates <28 days excluded) with a main underlying cause of death in the ICD-10-AM medical and injury categories outlined above. In addition, post-neonatal sudden unexpected deaths in infancy (SUDI) were included if the child was aged between 28 days and 1 year and their main underlying cause of death was SUDI (R95, R96, R98, R99, W75, W78, W79).

Denominator: Statistics NZ estimated resident population

Notes on Interpretation

Note 1: Hospital admissions in neonates (<28 days) were excluded from both indicators. These admissions are more likely to reflect issues arising prior to or at the time of birth (e.g. preterm infants may register multiple admissions as they transition from neonatal intensive care (NICU), through special care baby units (SCBU) to the postnatal ward). Further, the aetiology of respiratory infections and/or other medical conditions arising in these contexts may differ from those arising in the community.

Note 2: For medical conditions, only acute and arranged admissions were included, as waiting list admissions were seen as being more influenced by service capacity (e.g. the demographic profile of those admitted acutely with otitis media may have differed from those admitted from the waiting list for grommets (who in the vast majority of cases also have a primary diagnosis of otitis media)). For injury admissions, however, filtering by admission type was not undertaken. All injury cases with an Emergency Department specialty code (M05−M08) on discharge were excluded however (see **Appendix 2** for rationale).

Note 3: Hospital admissions were considered to have a social gradient if rates for those in the most deprived areas (NZDep deciles 9–10) were ≥1.8 times higher than for those in the least deprived areas (NZDep deciles 1–2), or where rates for Māori, Pacific or Asian/Indian children were ≥1.8 times higher than for European children. In addition, a small number of conditions were included where rates were ≥1.5 times higher, they demonstrated a consistent social gradient, and the association was biologically plausible.

Note 4: When considering differences in the magnitude of social gradients between medical and injury admissions note that these rates are not strictly comparable. For technical reasons, Emergency Department (ED) cases have been removed from injury admissions (and social differences in attendance at the ED vs primary care for minor medical conditions may have accounted for some of the social gradients in medical admission seen). No such differential filtering was applied to mortality data, however, and thus the magnitude of the social differences seen in mortality data is more readily comparable.

Note 5: SUDI rates are traditionally calculated per 1,000 live births. For this analysis the denominator used was children aged 0–14 years, so that the relative contribution SUDI makes to mortality in this age group (as compared to other causes of death) is more readily appreciated. As a result, the SUDI rates in this section are not readily comparable to traditional SUDI mortality rates for those <1 year reported elsewhere.

For further detail on the methodology used see **Appendix 8**.

Note 6: In 2013, a number of changes were made to the ICD-10-AM codes included in this indicator. The changes included the broadening of asthma (J45–J46) to asthma and wheeze (J45–J46, R062) to take into account a shift in the way paediatricians were diagnosing asthma in preschool children, and the addition of J22 (unspecified lower respiratory infections), due to the likely overlap with the already included J18.9 (unspecified pneumonia) category (see **Appendix 9**). Two additional codes were added to the sudden unexpected death in infancy (SUDI) indicator (W78: inhalation of gastric contents; and W79: inhalation and ingestion of food causing obstruction of the respiratory tract) to ensure consistency with the Child and Youth Mortality Review Committee's SUDI reporting. As a result, the rates in this section are not directly comparable with those presented in NZCYES reports prior to 2013.

New Zealand distribution and trends

Distribution by cause

Hospital Admissions: In New Zealand during 2009–2013, for Māori children, bronchiolitis, asthma and wheeze, and acute respiratory infections made the largest individual contributions to hospitalisations for medical conditions with a social gradient, and infectious and respiratory diseases collectively were responsible for the majority of admissions. Falls, followed by inanimate mechanical forces were the leading causes of injury admissions with a social gradient (**Table 45**).

Mortality: In New Zealand during 2007–2011, post-neonatal 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 deaths made the largest contribution to injury-related deaths, followed by drowning/submersion and pedestrian injuries, while bacterial/non-viral/unspecified pneumonia was the leading cause of mortality from medical conditions (**Table 46**).

Table 45. Hospital admissions for conditions with a social gradient in Māori children aged 0–14 years (excluding neonates) by primary diagnosis, New Zealand 2009–2013

Primary diagnosis	New Zealand			
	Number: total 2009−2013	Number: annual average	Rate per 1,000	Per cent of total
Māori children aged 0–14 years				
Medical conditions				
Acute bronchiolitis	13,420	2,684.0	11.78	20.8
Asthma and wheeze	10,739	2,147.8	9.42	16.6
Acute respiratory infections*	8,236	1,647.2	7.23	12.7
Skin infections	6,218	1,243.6	5.46	9.6
Gastroenteritis	5,769	1,153.8	5.06	8.9
Viral infection of unspecified site	5,241	1,048.2	4.60	8.1
Pneumonia: bacterial, non-viral	3,951	790.2	3.47	6.1
Urinary tract infection	1,621	324.2	1.42	2.5
Dermatitis and eczema	1,593	318.6	1.40	2.5
Croup/laryngitis/tracheitis/epiglottitis	1,506	301.2	1.32	2.3
Epilepsy or status epilepticus	1,335	267.0	1.17	2.1
Otitis media	940	188.0	0.82	1.5
Febrile convulsions	828	165.6	0.73	1.3
Pneumonia: viral	687	137.4	0.60	1.1
Rheumatic fever/heart disease	523	104.6	0.46	0.8
Inguinal hernia	392	78.4	0.34	0.6
Bronchiectasis	352	70.4	0.31	0.5
Vaccine preventable diseases	350	70.0	0.31	0.5
Osteomyelitis	337	67.4	0.30	0.5
Meningitis: viral, other, NOS	221	44.2	0.19	0.3
Meningococcal disease	198	39.6	0.17	0.3
Meningitis: bacterial	93	18.6	0.08	0.1
Nutritional deficiencies/anaemias	71	14.2	0.06	0.1
Tuberculosis	13	2.6	0.01	0.0
Total	64,634	12,926.8	56.71	100.0
Injury admissions				
Falls	6,048	1,209.6	5.31	47.2
Mechanical forces: inanimate	3,213	642.6	2.82	25.1
Mechanical forces: animate	945	189.0	0.83	7.4
Thermal injury	718	143.6	0.63	5.6
Transport: cyclist	589	117.8	0.52	4.6
Poisoning	568	113.6	0.50	4.4
Transport: vehicle occupant	348	69.6	0.31	2.7
Transport: pedestrian	305	61.0	0.27	2.4
Drowning/submersion	68	13.6	0.06	0.5
New Zealand total	12,802	2,560.4	11.23	100.0

Source: Numerator: National Minimum Dataset (neonates removed); Denominator: Statistics NZ Estimated Resident Population; Note: *Medical conditions*: acute and arranged admissions only; *upper and lower respiratory infections excluding croup; *Injury admissions*: excludes Emergency Department cases

Table 46. Mortality from conditions with a social gradient in Māori children aged 0–14 years (excluding neonates) by main underlying cause of death, New Zealand 2007–2011

Cause of death	Number: total 2007−2011	Number: annual average	Rate per 100,000	Per cent of category
Māori children aged 0–14 years				
Medical conditions				
Pneumonia: bacterial, non-viral	23	4.6	2.06	34.3
Meningococcal disease	11	2.2	0.99	16.4
Epilepsy/status epilepticus	6	1.2	0.54	9.0
Pneumonia: viral	6	1.2	0.54	9.0
Gastroenteritis	6	1.2	0.54	9.0
Asthma and wheeze	5	1.0	0.45	7.5
Meningitis: bacterial	3	0.6	0.27	4.5
Other conditions	7	1.4	0.63	10.4
Total medical conditions	67	13.4	6.01	100.0
Injuries				
Transport: vehicle occupant	41	8.2	3.68	42.3
Drowning/submersion	21	4.2	1.88	21.6
Transport: pedestrian	14	2.8	1.26	14.4
Poisoning	7	1.4	0.63	7.2
Mechanical forces: inanimate and animate	5	1.0	0.45	5.2
Thermal injury	3	0.6	0.27	3.1
Transport: cyclist	3	0.6	0.27	3.1
Falls	3	0.6	0.27	3.1
Total injuries	97	19.4	8.70	100.0
Post neonatal SUDI				
Post neonatal SUDI	173	34.6	15.52	
Total mortality New Zealand	337	67.4	30.24	

Source: Numerator: National Mortality Collection (neonates removed); Denominator: Statistics NZ Estimated Resident Population; Note: SUDI numerators are for infants aged 28–364 days only

New Zealand trends

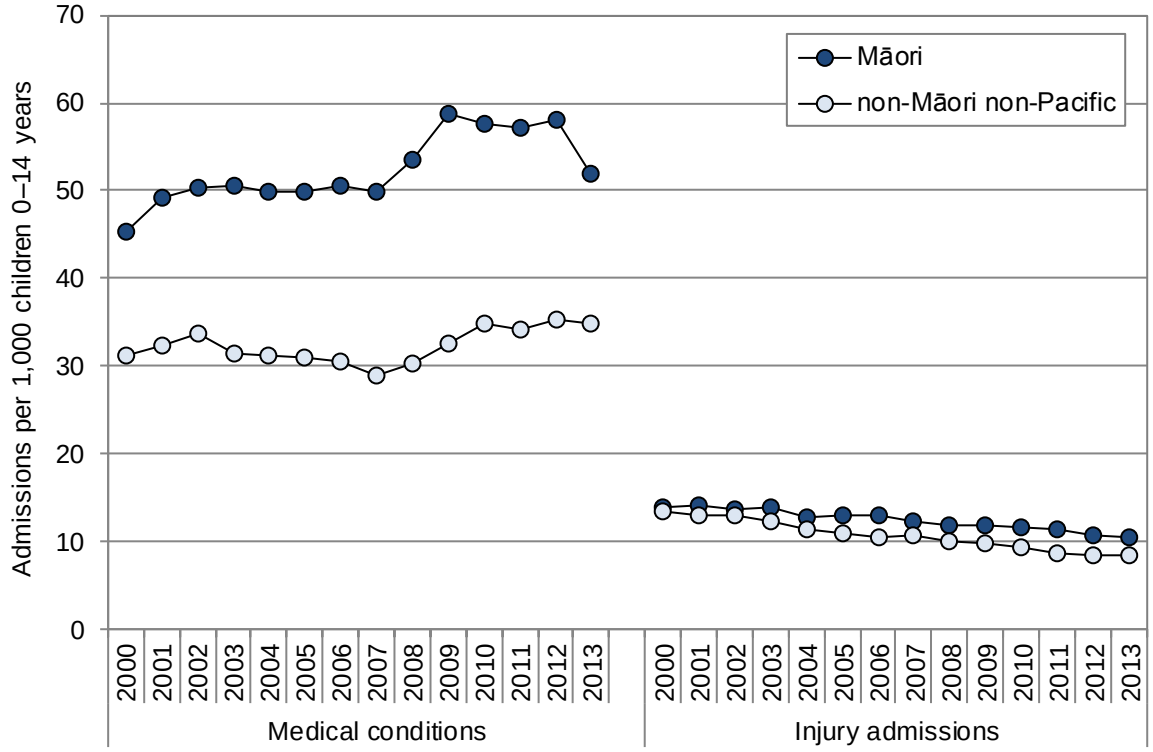
Hospital Admissions: In New Zealand, medical admissions with a social gradient in Māori children increased from 2000 to 2001, remained steady through to 2007, increased from 2007 to 2009, remained steady until 2012, and fell from 2012 to 2013 to reach a level similar to that seen in 2001–2007. In contrast, injury admissions with a social gradient fluctuated from year to year in the early 2000s and followed a downward trend from 2006 to 2013 (**Figure 82**).Throughout the period Māori children's medical admissions for conditions with a social gradient were considerably higher than those for non-Māori non-Pacific children. Their admissions for injuries with a social gradient were also higher than those for non-Māori non-Pacific children but the difference between the two groups was much less marked (**Figure 82**).

Note: Emergency Department (ED) cases are excluded from injury admissions so trends in medical and injury admissions are not comparable. Inconsistencies in DHB reporting of ED cases to the National Minimum Dataset may have affected trends in admissions for medical conditions with a social gradient. Many DHBs were reporting their ED cases from the early 2000s. **Figure 83** shows the increase in admissions in DHBs who changed their reporting

practice from 2009, when the Ministry made reporting of ED day cases mandatory. While the increase in numbers is modest, some (but not all) of the increase in medical admissions seen during this period may be due to these changes. See **Appendix 2** for further details.

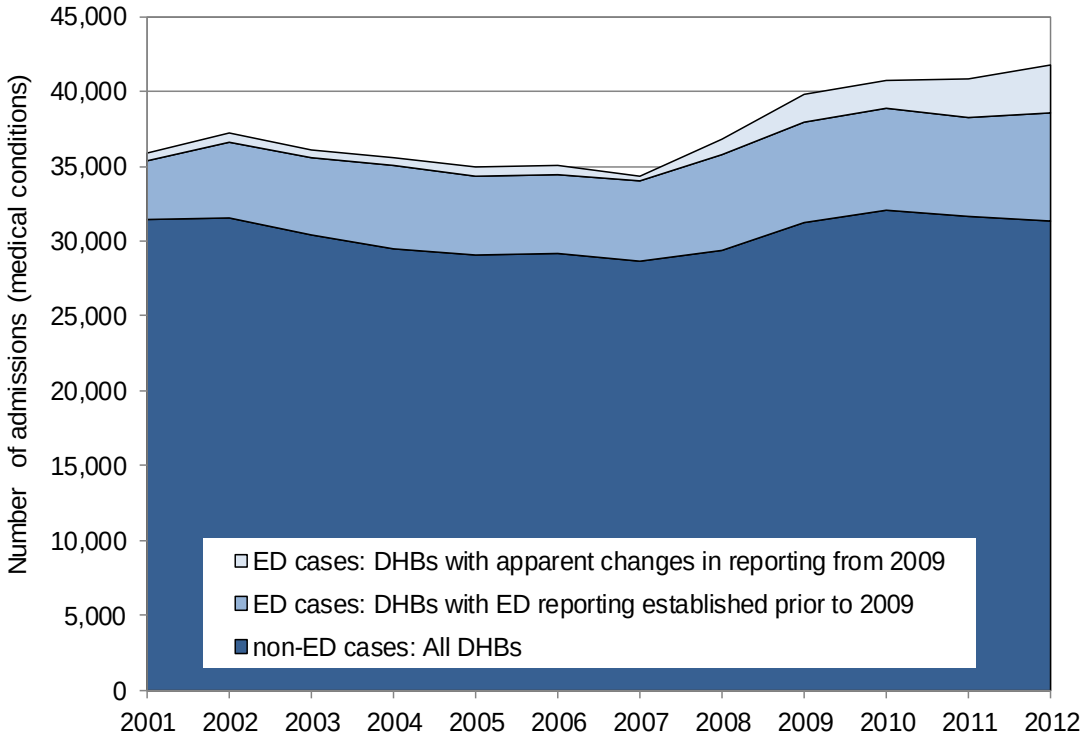
Mortality: In New Zealand, during 2000 to 2011, in Māori children, mortality from injuries with a social gradient has generally decreased over time, except for an increase from 2004–05 to 2006–07. Māori children's mortality rates for post-neonatal SUDI have shown year to year fluctuations, but, overall, have decreased since 2000–01. No clear trend is apparent in mortality due to medical conditions (**Figure 84)**. For non-Māori non-Pacific children mortality from injuries has declined, while mortality from medical conditions and post-neonatal SUDI has remained steady (**Figure 84**).

Figure 82. Hospital admissions for conditions with a social gradient in children aged 0–14 years (excluding neonates) by ethnicity, New Zealand 2000–2013



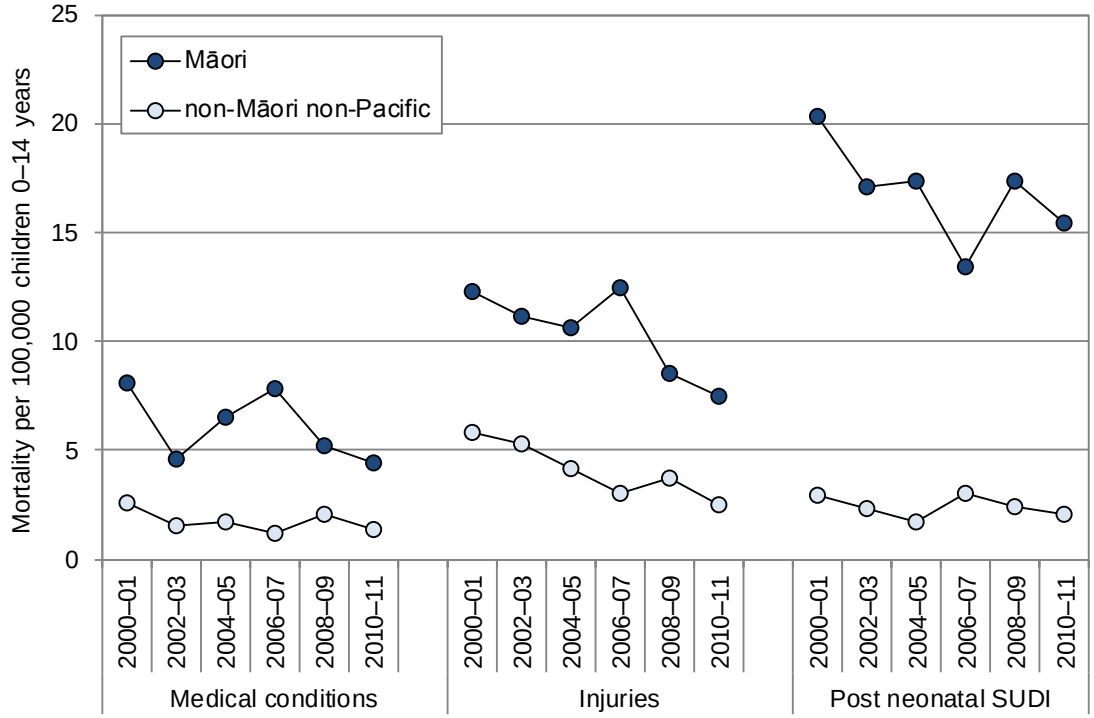
Source: Numerator Admissions: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population; Note: *Medical conditions*: acute and arranged admissions only; *injury*: excludes emergency department cases

Figure 83. 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; Note: ED cases are those with a health speciality code on discharge of M05–M08

Figure 84. Mortality from conditions with a social gradient in children aged 0–14 years (excluding neonates) by ethnicity, New Zealand 2000–2011



Source: Numerator Mortality: National Mortality Collection Denominator: Statistics NZ Estimated Resident Population

Distribution by DHB

In New Zealand during 2009–2013, hospital admission rates for conditions with a social gradient in Māori children varied by DHB. They were significantly higher than the national average for Māori children in Northland, Waitemata, Auckland, Counties Manukau, Bay of Plenty, Lakes, Tairawhiti, Whanganui and Hutt Valley DHBs, and significantly lower than the national average for Māori children in Waikato, Taranaki, MidCentral, Capital and Coast, Wairarapa, and all the South Island DHBs (**Table 47**).

Table 47. Hospital admissions for medical conditions with a social gradient in Māori children 0–14 years (excluding neonates) by District Health Board, New Zealand 2009−2013

District Health Board	Number: total 2009−2013	Number: annual average	Rate per 1,000	Rate ratio	95% CI
Māori children aged 0–14 years					
Hospital admissions for medical conditions with a social gradient					
Northland	5,624	1,125	61.5	1.08	1.06–1.11
Waitemata	5,598	1,120	61.6	1.09	1.06–1.12
Auckland	3,347	669	64.2	1.13	1.10–1.17
Counties Manukau	8,564	1,713	60.2	1.06	1.04–1.09
Waikato	7,726	1,545	54.9	0.97	0.95–0.99
Bay of Plenty	6,129	1,226	68.2	1.20	1.17–1.23
Lakes	3,808	762	64.4	1.14	1.10–1.17
Tairawhiti	2,567	513	68.3	1.20	1.16–1.25
Taranaki	1,610	322	47.0	0.83	0.79–0.87
Hawke's Bay	3,865	773	57.2	1.01	0.98–1.04
MidCentral	2,244	449	41.2	0.73	0.70–0.76
Whanganui	1,921	384	73.4	1.29	1.24–1.35
Hutt Valley	2,828	566	70.9	1.25	1.21–1.30
Capital & Coast	2,452	490	49.6	0.88	0.84–0.91
Wairarapa	602	120	50.9	0.90	0.83–0.97
Nelson Marlborough	761	152	33.4	0.59	0.55–0.63
South Canterbury	168	34	22.6	0.40	0.34–0.46
Canterbury	2,522	504	36.4	0.64	0.62–0.67
West Coast	174	35	30.0	0.53	0.46–0.61
Southern	1,972	394	42.0	0.74	0.71–0.77
New Zealand	64,634	12,927	56.7	1.00	

Source: Numerator: National Minimum Dataset (neonates removed); Denominator: Statistics NZ Estimated Resident Population; Note: acute and arranged admissions only

INFANT MORTALITY AND SUDDEN UNEXPECTED DEATH IN INFANCY

Introduction

The following section uses information from the National Mortality Collection to review Māori neonatal, post neonatal, and total infant mortality rates, and SUDI rates, since 1990.

Background

Infant mortality, defined as the death of a child before his or her first birthday, is widely used as an indicator of the health of a country [170]. In a recent OECD report, New Zealand's infant mortality rates were shown to be lower than those in the United States, Turkey, Chile and Mexico, but higher than those of the rest of the OECD countries for 2009–2011 [171]. Mortality is higher during the first year of life than at any other time during childhood and adolescence in New Zealand [172]. Around half of all infant deaths occur in the first week of life [173].

The past sixty years have seen a steady decline in New Zealand's infant mortality rates, from 25.7 per 1,000 live births in 1953 to 4.9 in 2003, but the rate of decline has slowed over the past decade. The infant mortality rate in 2013 was 4.4 per 1,000 [174]. Infant mortality rates are generally higher for Māori and Pacific infants and for males [175]. There are significant socioeconomic inequalities and in 2008 and 2009, the infant mortality rate in the most deprived NZ Deprivation Index quintile was over twice that in the least deprived quintile [176]. The causes of infant mortality differ markedly with the age of the infant so total infant mortality rates are of limited utility for guiding population health interventions. For neonates (babies in the first 27 days of life), prematurity is a major cause of death, often in association with extremely low birthweight [176] and congenital malformations are also a common cause of death. Sudden Unexpected Death in Infancy (SUDI), and congenital anomalies are the most common causes of death in the post neonatal period (28 days to one year) [177]. In comparing Māori infant mortality rates with European/Other, the greatest disparities are for SUDI rates which, in 2002–2007 were over four times higher. To address this, there has been considerable effort devoted to the promotion of safer sleeping environments, such as the wahakura and the pēpi-pod [178].

Data Source and Methods

Definition

1. *Total infant mortality: Death of a live born infant prior to 365 days of life*
2. *Neonatal mortality: Death of a live born infant in the first 27 days of life*
3. *Post neonatal mortality: Death of a live born infant after 27 days but prior to 365 days of life*
4. *Sudden Unexpected Death in Infancy: Death of a live born infant <365 days of life, where the cause of death is Sudden Infant Death Syndrome (SIDS), Accidental suffocation/strangulation in bed, Inhalation of gastric contents/food, or Ill-defined/unspecified causes*

Data Sources

Numerator: National Mortality Collection: All deaths in the first year of life, using the definitions outlined above. Cause of death was derived from the ICD-10-AM main underlying cause of death as follows: Congenital anomalies: CVS (Q20); Congenital anomalies: CNS (Q00–Q07); Congenital anomalies: Other (remainder of Q00–Q99); Intrauterine/Birth asphyxia (P20–P21); Extreme prematurity (P07.2); Other perinatal conditions (P00–P96 excluding P07.2 and P20–P21); SUDI: SIDS (R95); SUDI: Unspecified (R96, R98, R99); SUDI: Suffocation/strangulation in bed (W75); SUDI: Inhalation of gastric contents/food (W78, W79); Injury/Poisoning (V01–Y36).

Denominator: Birth Registration Dataset (live births only)

Notes on Interpretation

Note 1: SUDI and SIDS: SIDS is defined as "the sudden unexpected death of an infant <1 year of age, with onset of the fatal episode apparently occurring during sleep, and that remains unexplained after a thorough investigation, including performance of a complete autopsy and review of the circumstances of death and the clinical history" [179]. Issues have emerged with defining SIDS, possibly as the result of pathologists and coroners becoming increasingly reluctant to label a death as SIDS in the context of equivocal death scene

findings (e.g. death of an infant who had been co-sleeping with a parent who had recently consumed alcohol [180]). This has resulted in a fall in the number of SIDS deaths, and a rise in the number of deaths attributed to "suffocation/strangulation in bed" or "unspecified causes".

Note 2: In New Zealand, while SIDS rates have declined, there are still large ethnic differences and SIDS rates are six times higher for Māori infants than for European infants [181].

Note 3: Two additional codes were added to the SUDI indicator in 2013 (W78: Inhalation of gastric contents; and W79: Inhalation and ingestion of food causing obstruction of the respiratory tract) to ensure consistency with the Child and Youth Mortality Review Committee's SUDI reporting. As a result, the rates in this section are not directly comparable with those presented in NZCYES reports prior to 2013. See **Appendix 4** for an overview of the National Mortality Collection.

Total infant, neonatal and post neonatal mortality

New Zealand distribution and trends

Distribution by cause

In New Zealand during 2007–2011, extreme prematurity and congenital anomalies were the leading causes of Māori neonatal mortality, although intrauterine/birth asphyxia and other perinatal conditions also made a significant contribution. In contrast, SUDI was the leading cause of post neonatal mortality, followed by congenital anomalies (**Table 48**).

New Zealand trends by ethnicity

In New Zealand during the late 1990s Māori neonatal and post neonatal mortality both declined. While there was some year to year variation during the 2000s, Māori neonatal and mortality rates in 2010–11 were very similar to what they were in the early 2000s. Māori post-neonatal mortality decreased considerably from 1996–07 to 2002–03, but since then has declined only slightly (Non-Māori neonatal mortality has fluctuated from year to year but overall there has been no clear trend, while non-Māori post-natal mortality has decreased slightly over the period 1996–2011 (**Figure 85**). Throughout the period, neonatal and post-neonatal mortality was consistently higher for Māori than non-Māori non-Pacific infants (**Figure 85**) and, on average, for 2007–2011, *significantly* higher (**Table 49).**

Table 48. Neonatal and post neonatal mortality cause of death in Māori infants, New Zealand 2007–2011

Cause of death	Number: Total 2007–2011	Number: Annual average	Rate	Per cent of deaths
Māori infants				
Neonatal mortality				
Extreme prematurity	113	22.6	119.97	33.9
Congenital anomalies: Chromosomal	12	2.4	12.74	3.6
Congenital anomalies: CVS	14	2.8	14.86	4.2
Congenital anomalies: CNS	10	2.0	10.62	3.0
Congenital anomalies: other	31	6.2	32.91	9.3
Intrauterine/birth asphyxia	6	1.2	6.37	1.8
Other perinatal conditions	111	22.2	117.85	33.3
SUDI: SIDS	8	1.6	8.49	2.4
SUDI: All other types	18	3.6	19.11	5.4
Other causes	10	2.0	10.62	3.0
Total neonatal mortality	333	66.6	353.55	100.0
Post neonatal mortality				
SUDI: SIDS	81	16.2	86.00	24.1
SUDI: Suffocation/strangulation in bed	79	15.8	83.88	23.5
SUDI: All other types	13	2.6	13.80	3.9
Congenital anomalies: Chromosomal	4	0.8	4.25	1.2
Congenital anomalies: CVS	16	3.2	16.99	4.8
Congenital anomalies: CNS	3	0.6	3.19	0.9
Congenital anomalies: other	13	2.6	13.80	3.9
Other perinatal conditions	30	6.0	31.85	8.9
Injury/poisoning	16	3.2	16.99	4.8
Other causes	81	16.2	86.00	24.1
Total post neonatal mortality	336	67.2	356.74	100.0
Total infant mortality	669	133.8	710.29	

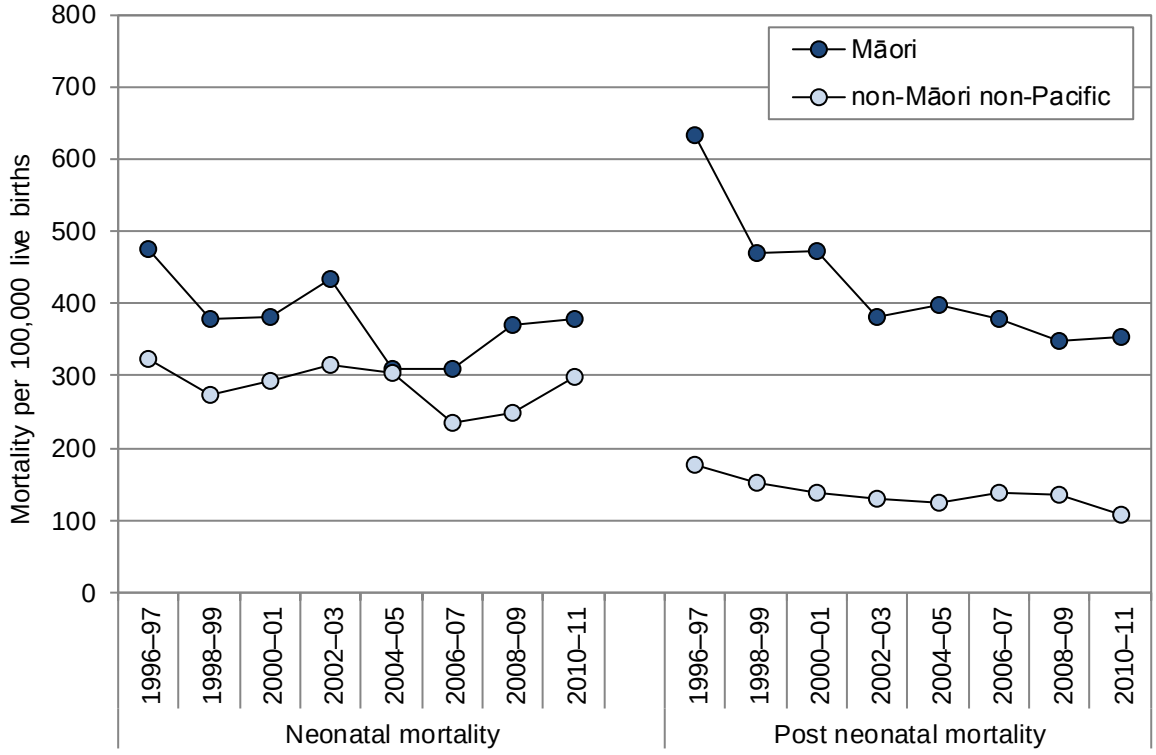
Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Note: CVS = Cardiovascular system; CNS = Central Nervous System; SUDI = Sudden Unexpected Death in Infancy; SIDS = Sudden Infant Death Syndrome; Rates per 100,000 live births

Table 49. Neonatal and post neonatal mortality by ethnicity, New Zealand 2007–2011

Ethnicity	Number: total 2007−2011	Number: annual average	Rate per 100,000	Rate ratio	95% CI
Neonatal mortality					
Māori	333	67	353.6	1.33	1.16–1.53
non-Māori non-Pacific	506	101	265.7	1.00	
Post neonatal mortality					
Māori	336	67	356.7	2.89	2.45–3.41
non-Māori non-Pacific	235	47	123.4	1.00	

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Note: rates are per 100,000 live births; Rate ratios are unadjusted; ethnicity is Level 1 prioritised;

Figure 85. Total infant, neonatal and post neonatal mortality by ethnicity, New Zealand 1996–2011



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

Sudden Unexpected Death in Infancy

Trends and distribution by ethnicity

In New Zealand during 1996–2011, SUDI mortality was consistently higher for Māori than for non-Māori non-Pacific infants. Rates for both ethnic groups exhibited a general downward trend, but Māori rates declined more steeply so that the absolute difference between the two ethnic groups decreased over the period (**Figure 86**).

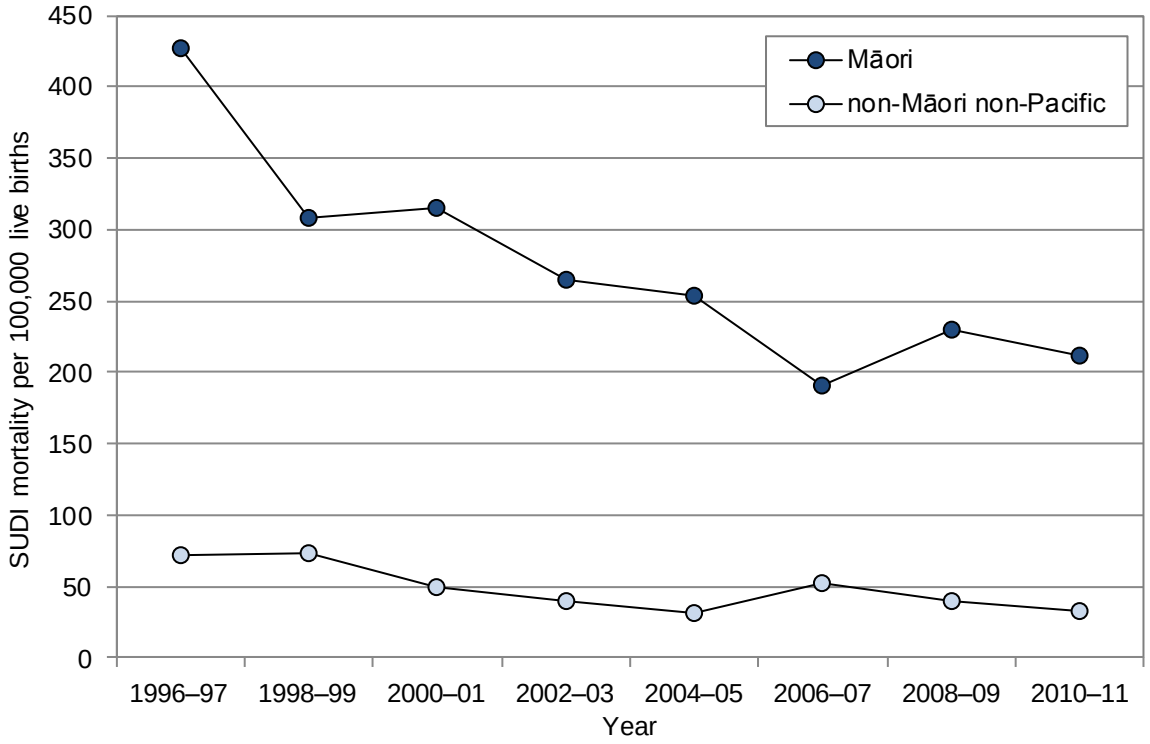
In New Zealand during 2007–2011, mortality from SUDI was *significantly* higher for Māori infants than for non-Māori non-Pacific infants. On average during this period, 40 Māori infants each year died as the result of SUDI (**Table 50**).

Table 50. Sudden unexpected death in infancy (SUDI) by ethnicity, New Zealand 2007–2011

Ethnicity	Number: total 2007−2011	Number: annual average	Rate per 100,000	Rate ratio	95% CI
Sudden unexpected death in infancy					
Māori	199	40	211.28	5.37	4.11–7.00
non-Māori non-Pacific	75	15	39.38	1.00	

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Rates are per 100,000 live births; Rate ratios are unadjusted; Ethnicity is Level 1 prioritised

Figure 86. Sudden unexpected death in infancy (SUDI) by ethnicity, New Zealand 1996−2011



Source: National Mortality Collection; Note: Ethnicity is Level 1 prioritised

SAFETY AND FAMILY VIOLENCE

INJURIES ARISING FROM THE ASSAULT, NEGLECT OR MALTREATMENT OF CHILDREN

Introduction

The following section reviews hospital admissions and mortality from 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. Child abuse (acts of commission) includes physical, sexual and emotional abuse, and fabricated or induced illness. Child neglect (acts of omission) includes failure to: provide for a child's physical and emotional needs; obtain necessary medical or dental care; ensure a child has access to education; provide adequate supervision, and prevent exposure to violent environments [182]. Child abuse and neglect have both short term and lifelong physical, psychological, and behavioural consequences for individuals and consequences for society. Survivors of childhood sexual abuse are at risk for a wide range of medical, psychological, behavioural, and sexual disorders [183]. Studies on child abuse or neglect and subsequent mental and physical health outcomes suggest a causal relationship between non-sexual child maltreatment and a range of mental disorders, suicide attempts, drug use, and risky sexual behaviour [184].

Most child maltreatment is perpetrated by parents or guardians, many of whom were themselves maltreated as children [184,185]. Poverty, sole parenthood, the presence of a non-biological parent in the household, mental health problems, domestic violence, and alcohol and drug abuse increase the probability of abusive parenting [184,185]. Characteristics that make a child more difficult to care for than usual, for example crying a lot, having a difficult temperament, or being disabled, may increase a child's risk of being maltreated, especially where there are other demographic or family risk factors [186].

A UNICEF report on child maltreatment deaths from 1994 to 1998 ranked New Zealand near the bottom in the OECD [187] with a rate of 1.2 deaths per 100,000 children under 15 years, double the OECD median. Over the period 2002–2012 New Zealand's rates of child death due to assault have not improved [177].

Data Source and Methods

Indicator

1. *Hospital admissions for injuries arising from the assault, neglect, or maltreatment of children 0–14 years*
2. *Deaths from injuries arising from the assault, neglect, or maltreatment of children 0–14 years*

Data Source

1. Hospital admissions

Numerator: National Minimum Dataset: Hospital admissions for children (0–14 years) with a primary diagnosis of injury (ICD-10-AM S00–T79) and an external cause code of intentional injury (ICD-10-AM X85–Y09) in any of the first 10 external cause codes. As outlined in **Appendix 2** in order to ensure comparability over time, all cases with an emergency department specialty code (M05–M08) on discharge were excluded, as were admissions with a primary diagnosis outside of the ICD-10-AM S00–T79 injury range.

Denominator: NZ Statistics NZ Estimated Resident Population

2. Mortality

Numerator: National Mortality Collection: Deaths in children (0–14 years) with a clinical code (cause of death) of intentional injury (ICD-10-AM X85–Y09).

Denominator: NZ Statistics NZ Estimated Resident Population

Notes on Interpretation

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

New Zealand distribution and trends

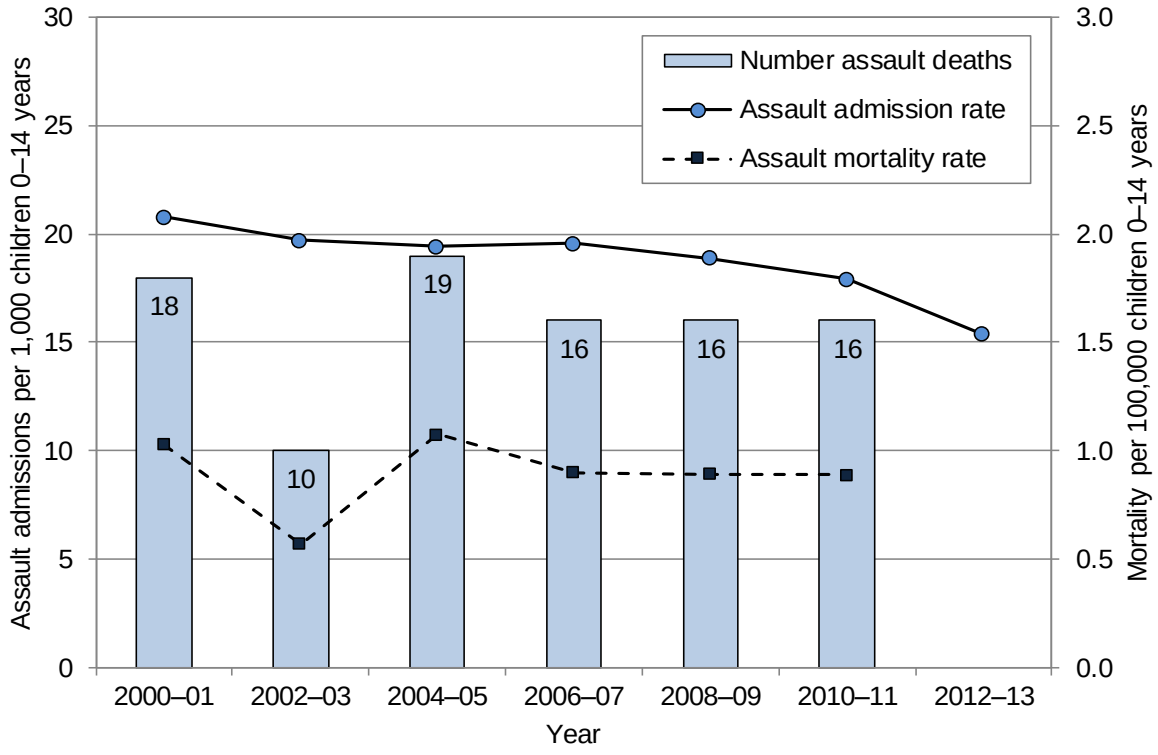
New Zealand trends

In New Zealand during 2000–2013, hospital admissions for injuries arising from the assault, neglect, or maltreatment of children declined gradually, while mortality during 2000–2011 remained relatively static. On average during 2000–2011, approximately eight children per year died as a result of injuries arising from assault, neglect, or maltreatment (**Figure 87**).

Distribution and trends by ethnicity

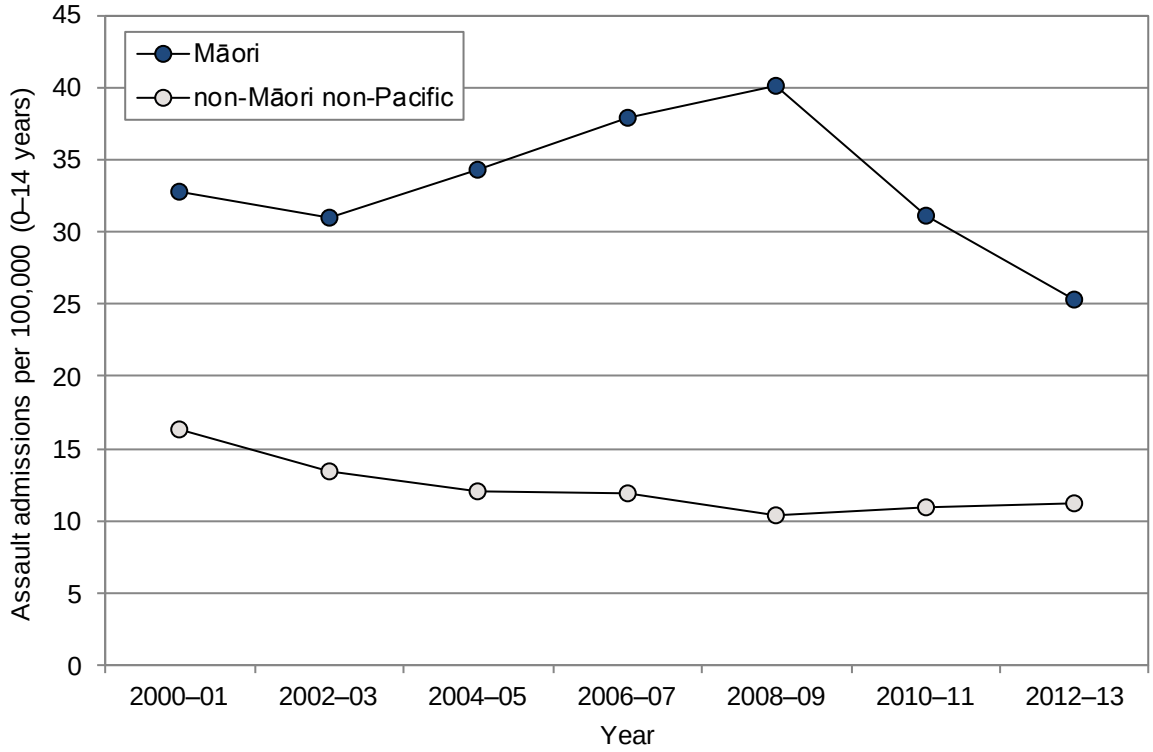
In New Zealand, during 2000–2013, Māori children's admission rates for injuries due to assault, neglect of maltreatment increased from 2002–2003 to 2008–09, and then declined Rates for non-Māori non-Pacific children declined slightly from 2000–2001 to 2008–09 and from then on changed little (**Figure 88**). Māori children's rates were higher than rates for non-Māori non-Pacific children throughout the period 2000–2013 (**Figure 88**). They were significantly higher for the period 2009–2013 (**Table 51).** The number of deaths was too small for it to be possible to undertake any meaningful analysis by ethnicity.

Figure 87. Hospital admissions (2000–2013) and deaths (2000–2011) due to injuries arising from the assault, neglect, or maltreatment of New Zealand children aged 0–14 years



Source: Numerator: *Admissions*: National Minimum Dataset (emergency department cases excluded); *Mortality*: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population; Note: numbers of deaths are per two year period

Figure 88. Hospital admissions for injuries arising from the assault, neglect or maltreatment of children aged 0–14 years by ethnicity, New Zealand 2000–2013



Source: Numerator: National Minimum Dataset (emergency department cases excluded); Denominator: Statistics NZ Estimated Resident Population; Note: Ethnicity is level 1 prioritised

Table 51. Hospital admissions for injuries arising from the assault, neglect or maltreatment of children aged 0–14 years, by ethnicity, New Zealand 2009–2013

Ethnicity	Number: total 2009−2013	Number: annual average	Rate per 100,000	Rate ratio	95% CI
Children aged 0–14 years					
Assault, neglect or maltreatment injuries					
Māori	356	71	31.24	2.79	2.41–3.25
non-Māori non-Pacific	329	66	11.18	1.00	

Source: Numerator: National Minimum Dataset (emergency department cases excluded); Denominator: Statistics NZ Estimated Resident Population; Note: Rate is per 100,000; Rate ratios are unadjusted; Ethnicity is level 1 prioritised

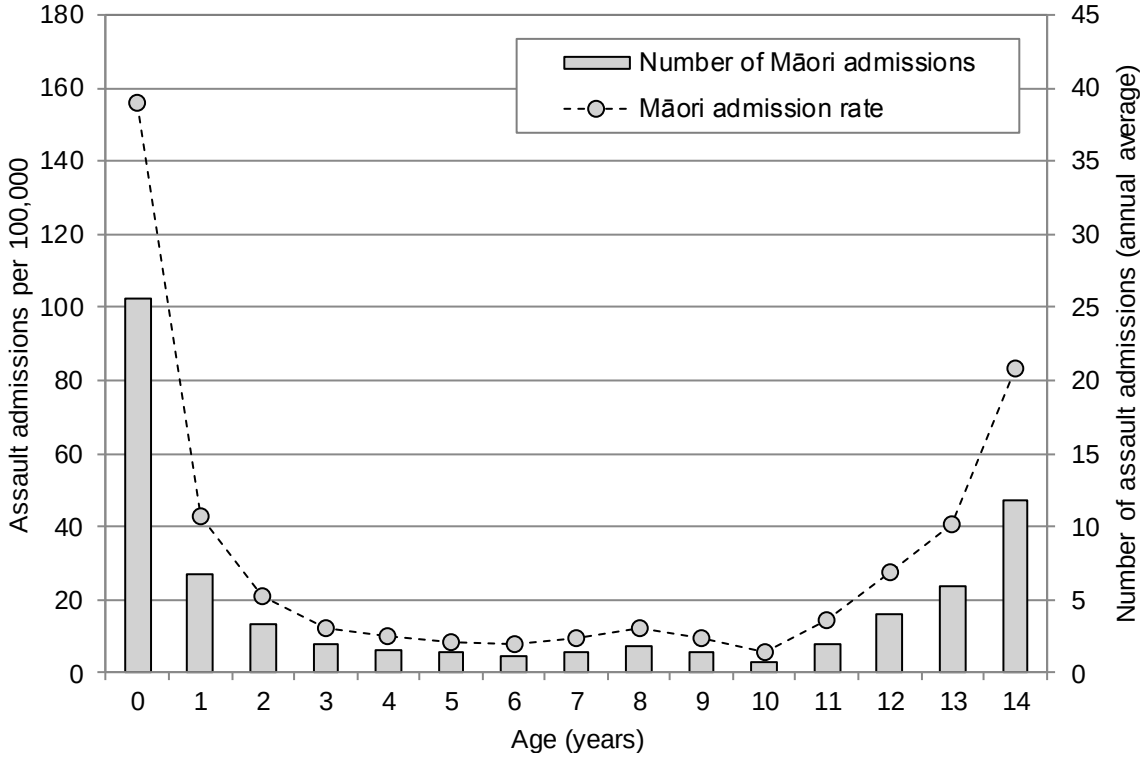
Distribution by age

In New Zealand during 2009–2013, hospital admissions for injuries arising from the assault, neglect or maltreatment of Māori children exhibited a U-shaped distribution with age. Infants aged less than one year had the highest rates. Admissions rates were lowest during mid-childhood, but increased with age after eleven years of age (**Figure 89**).

Nature of the injuries sustained

Amongst Māori children aged 0–4 years who were hospitalised with injuries sustained as the result of assault, neglect or maltreatment during 2009–2013, traumatic subdural haemorrhage were the most frequently assigned primary diagnosis, followed by superficial head injuries. Head injuries as a group accounted for 66.0% of such admissions in these children. In Māori children aged 5–9 years, head injuries accounted for 50% of such admissions (superficial head injuries 22.2.% and other head injuries 27.8%), while in Māori children aged 10–14 years, concussion was the most common primary diagnosis (17.9% of the total), followed by fracture of the skull or facial bones and injuries to the upper limb (both 17.1%) (**Table 52**).

Figure 89. Hospital admissions (2009–2013) due to injuries arising from the assault, neglect or maltreatment of New Zealand children by age and gender



Source: Numerator: *Admissions*: National Minimum Dataset (emergency department cases excluded); *Mortality*: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population

Table 52. Nature of injuries arising from assault, neglect or maltreatment in hospitalised Māori children 0–14 years by age group, New Zealand 2009–2013

Primary diagnosis	Number: total 2009−2013	Number: annual average	Rate per 100,000	Percent
Assault, neglect or maltreatment				
Māori children aged 0–4 years				
Traumatic subdural haemorrhage	56	11.2	13.85	28.4
Superficial head injury	33	6.6	8.16	16.8
Fracture skull or facial bones	10	2.0	2.47	5.1
Other head injuries	31	6.2	7.66	15.7
Injuries to thorax (including rib fractures)	3	0.6	0.74	1.5
Injuries to abdomen, lower back, and pelvis	4	0.8	0.99	2.0
Injuries to upper limb	14	2.8	3.46	7.1
Fractured femur	7	1.4	1.73	3.6
Other injuries to lower limb	5	1.0	1.24	2.5
Maltreatment	22	4.4	5.44	11.2
Other injuries	12	2.4	2.97	6.1
Total	197	39.4	48.71	100.0
Māori children aged 5–9 years				
Superficial head injury	8	1.6	2.12	22.2
Other head injuries	10	2.0	2.65	27.8
Injuries to abdomen, lower back, and pelvis	3	0.6	0.79	8.3
Injuries to upper limb	4	0.8	1.06	11.1
Maltreatment	3	0.6	0.79	8.3
Other injuries	8	1.6	2.12	22.2
Total	36	7.2	9.53	100.0
Māori children aged 10–14 years				
Fracture skull or facial bones	21	4.2	5.9	17.1
Concussion	22	4.4	6.2	17.9
Superficial head injury	13	2.6	3.6	10.6
Other head injuries	16	3.2	4.5	13.0
Injuries to thorax (including rib fractures)	5	1.0	1.4	4.1
Injuries to abdomen, lower back, and pelvis	7	1.4	2.0	5.7
Injuries to upper limb	21	4.2	5.9	17.1
Injuries to lower limb	8	1.6	2.2	6.5
Maltreatment	3	0.6	0.8	2.4
Other injuries	7	1.4	2.0	5.7
Total	123	24.6	34.4	100.0

Source: Numerator: National Minimum Dataset (emergency department cases excluded); Denominator: Statistics NZ Estimated Resident Population; Note: Rate is per 100,000; Ethnicity is level 1 prioritised

INJURIES ARISING FROM ASSAULT IN YOUNG PEOPLE

Introduction

The following section explores hospital admissions and mortality from 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

Witnessing, perpetrating, or being a victim of assault is a relatively common experience for young people in New Zealand. The Youth ’12 survey of 8,500 secondary school students from across New Zealand (including 1,701 who reported Māori ethnicity) found that almost one third (32.3%) of Māori students reported being hit or physically harmed by someone in the last 12 months, and 17% had witnessed adults in their home hitting or physically hurting a child (other than themselves) [188]. Of all age groups in the population, young people aged 15–24 years are the most likely to be victims of violence [189].

The Christchurch longitudinal study examined the factors which place young people at risk of physical assault [190]. It found that the major predictors of assault victimisation during late adolescence included both childhood factors and concurrent factors. The significant childhood predictors were being male, a history of parental alcohol problems, regular or severe physical punishment, and early adolescent conduct problems. The significant predictors during late adolescence were alcohol abuse/dependence and violent and other offending. The authors of this study stated that their findings are consistent with those of other studies which have shown a considerable overlap between the perpetrators and victims of violent crime.

Recent alcohol consumption by both the perpetrators and the victims of assault is common, and associated with more severe injury [191]. A recently published study examining the effect on assault rates of the lowering of the minimum alcohol purchasing age in New Zealand (in 1999) found that it increased weekend assaults resulting in hospitalisations among young men aged 15 to 19 years (relative to young men aged 20 to 21 years) but had no statistically significant effect in young women [192].

Data source and methods

Indicator

1. Hospital admissions for injuries arising from assault in young people aged 15–24 years
2. Deaths from injuries arising from assault in young people aged 15–24 years

Data source

1. Hospital admissions

Numerator: National Minimum Dataset: Hospital admissions in young people aged 15–24 years with a primary diagnosis of injury (ICD-10-AM S00–T79) and an external cause code of intentional injury (ICD-10-AM X85–Y09) in any of the first 10 external cause codes. As outlined in **Appendix 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

2. Mortality

Numerator: National Mortality Collection: Deaths in young people aged 15–24 years with a clinical code (cause of death) of intentional injury (ICD-10-AM X85–Y09).

Denominator: NZ Statistics NZ Estimated Resident Population

Interpretation

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

New Zealand distribution and trends

New Zealand trends

In New Zealand during 2000–2013, hospital admissions for injuries arising from assault in young people remained relatively static, while mortality during 2000–2013 fluctuated from year to year. On average during 2000–2011, around 12 young people per year died from injuries arising from an assault (**Figure 90**).

Distribution and trends by ethnicity

In New Zealand, during 2000–2013, Māori young people's admission rates for injuries due to assault were variable. The rate for 2013 was the lowest in the whole period. Rates for non-Māori non-Pacific young people were steady from 2000–01 to 2006–07 and since then have been declining slightly (**Figure 91**). Rates for Māori young people were higher than rates for non-Māori non-Pacific young people throughout the period 2000–2013 (**Figure 91**). They were significantly higher for the period 2009–2013 (**Table 53**). The number of deaths was too small for it to be possible to undertake any meaningful analysis by ethnicity.

Distribution by age

Amongst Māori young people during 2009–2013, hospital admission rates for injuries arising from assault increased with increasing age from ages 15 to 18 years but changed very little with increasing age from ages 18 to 23 years. The rates in 24 year olds was lower than in any of the 18–23 years age groups (**Figure 92**).

Nature of the injury sustained

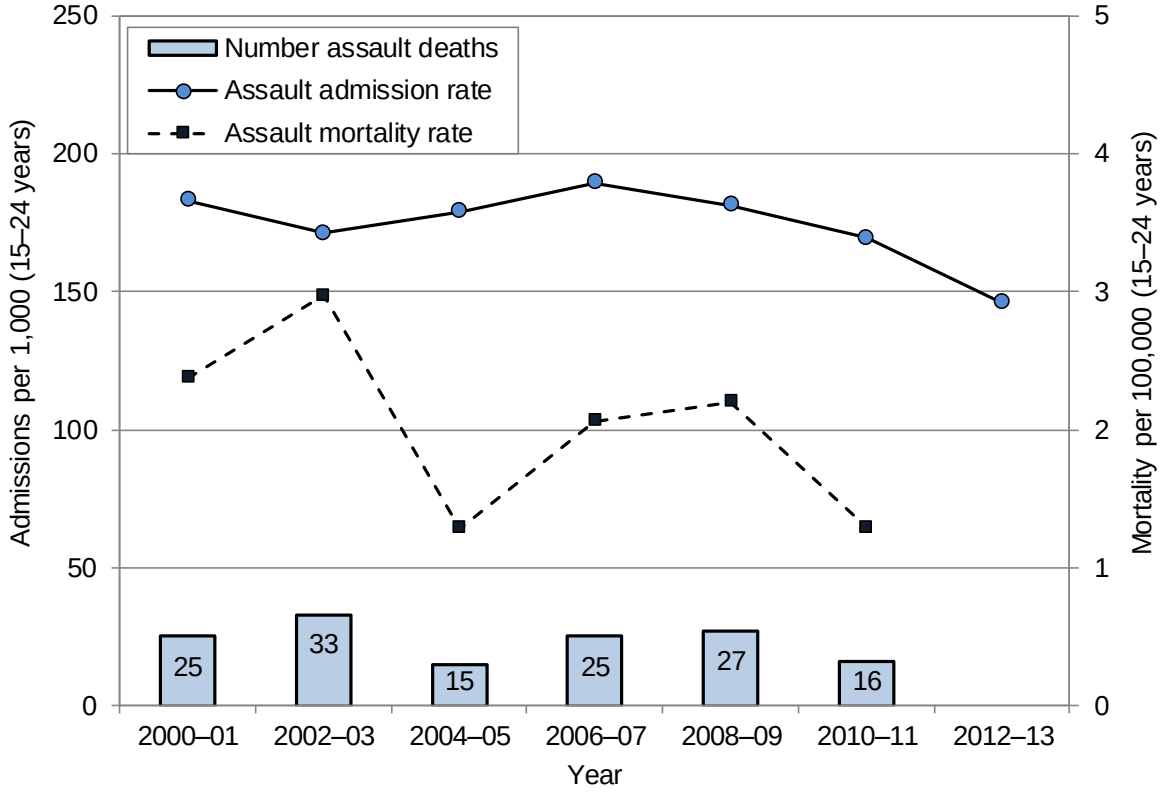
Of the 1,840 Māori young people hospitalised as the result of an assault during 2009−2013, 1,115 (60.6%) had a primary diagnosis of a head injury and 725 (39.4%) had a primary diagnosis of a non-head injury. Fractures of the lower jaw were the most frequent primary diagnosis assigned (24.2% of all admissions), followed by injuries of the wrist and hand (13.5% of all admissions). Head and upper limb injuries collectively accounted for 81.7% of admissions (**Table 54**).

Table 53. Hospital admissions for injuries arising from assault in young people aged 15–24 years, by ethnicity, New Zealand, 2009–2013

Ethnicity	Number: total 2009−2013	Number: annual average	Rate per 100,000	Rate ratio	95% CI
Young people aged 15–24 years					
Assault admissions					
Māori	1,840	368.0	295.8	2.62	2.47–2.79
non-Māori non-Pacific	2,505	501.0	112.8	1.00	

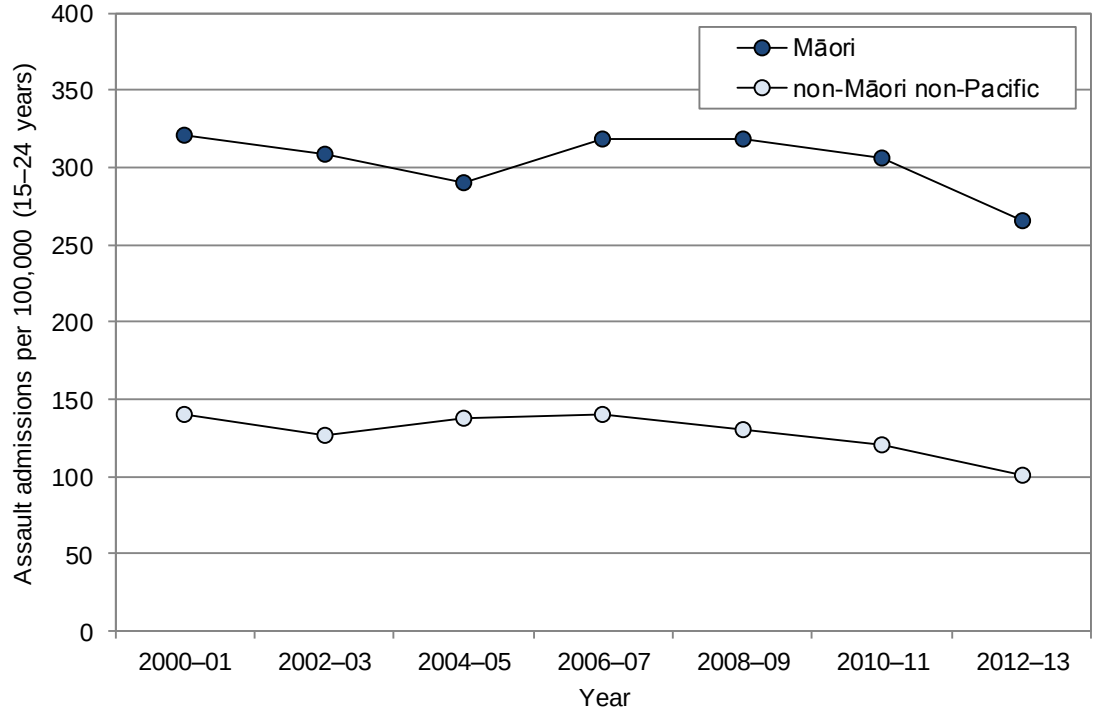
Source: Numerator: National Minimum Dataset (emergency department cases excluded); Denominator: Statistics NZ Estimated Resident Population; Note: Rate is per 100,000; Rate ratios are unadjusted; Ethnicity is level 1 prioritised

Figure 90. Hospital admissions (2000–2013) and deaths (2000–2011) due to injuries arising from assault in New Zealand young people aged 15–24 years



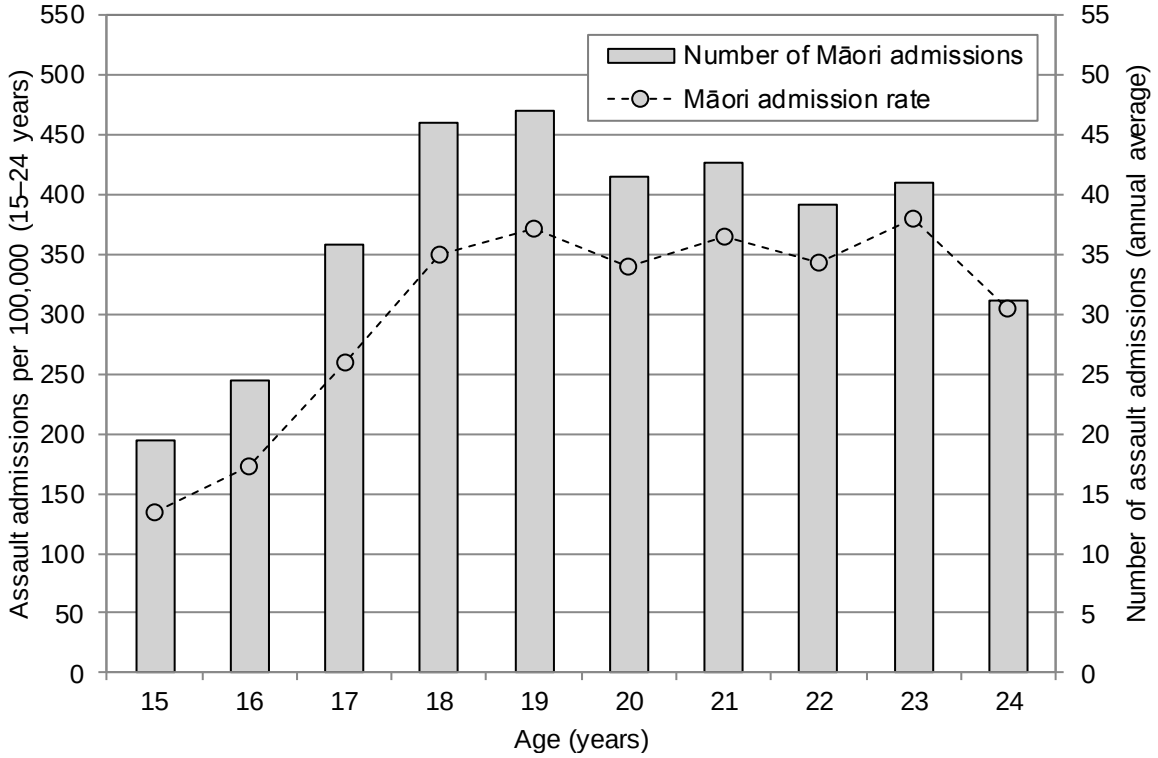
Source: Numerator: Admissions: National Minimum Dataset (emergency department cases excluded); Mortality: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population; Note: numbers of deaths are per two year period

Figure 91. Hospital admissions for injuries arising from assault in young people aged 15−24 years by ethnicity, New Zealand 2000–2013



Source: Numerator: National Minimum Dataset (emergency department cases excluded); Denominator: Statistics NZ Estimated Resident Population; Note: Ethnicity is level 1 prioritised

Figure 92. Hospital admissions (2009–2013) due to injuries arising from assault in Māori young people by age



Source: Numerator: *Admissions*: National Minimum Dataset (emergency department cases excluded); *Mortality*: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population

Table 54. Nature of injuries arising from assault in hospitalised Māori young people aged 15–24 years, New Zealand 2009–2013

Primary diagnosis	Number: total 2009−2013	Number: annual average	Rate per 100,000	Per cent
Assault admissions for Māori young people aged 15–24 years				
Head injuries				
Fracture of the lower jaw	446	89.2	71.69	24.2
Concussion	100	20.0	16.07	5.4
Open wound of head	92	18.4	14.79	5.0
Fracture of the nasal bones	61	12.2	9.81	3.3
Superficial head injury	57	11.4	9.16	3.1
Fracture of the orbital floor	54	10.8	8.68	2.9
Fracture of malar and maxillary bones	53	10.6	8.52	2.9
Other fractures skull or facial bones	40	8.0	6.43	2.2
Traumatic subdural haemorrhage	32	6.4	5.14	1.7
Open wound eyelid/eye area	32	6.4	5.14	1.7
Other head injuries	148	29.6	23.79	8.0
Other injuries				
Injuries to abdomen, spine, and pelvis	143	28.6	22.99	7.8
Fracture of wrist/hand	92	18.4	14.79	5.0
Other injuries to wrist and hand	156	31.2	25.08	8.5
Injuries to elbow and forearm	92	18.4	14.79	5.0
Injuries to knee/lower leg/foot/ankle	61	12.2	9.81	3.3
Injuries to thorax (including rib fractures)	59	11.8	9.48	3.2
Injuries to shoulder/upper arm	48	9.6	7.72	2.6
Injuries to neck	42	8.4	6.75	2.3
Injuries to hip and thigh (incl. fractured femur)	11	2.2	1.77	0.6
Other injuries	21	4.2	3.38	1.1
Total Injuries	1840	368.0	295.78	100.0

Statistics NZ Estimated Resident Population; Note: Rate is per 100,000; Ethnicity is level 1 prioritised

CHILD YOUTH AND FAMILY NOTIFICATIONS

Introduction

The following section reviews the number of care and protection notifications received by Child Youth and Family offices in recent years.

Background

Child, Youth and Family (CYF) is a service of the Ministry of Social Development. Its roles include promoting the wellbeing of children, young people and their families and the prevention of child abuse and neglect [193]. The Children, Young Persons, and Their Families Act 1989 states that: "Any person who believes that any child or young person has been, or is likely to be, harmed (whether physically, emotionally, or sexually), ill-treated, abused, neglected, or deprived may report the matter to a social worker or a constable", and that any social worker or constable receiving such a report shall ensure that it is investigated [194]. Child, Youth and Family social workers are legally bound to follow up all concerns about children's welfare that are notified to them. The greatest number of referrals to CYF come from the Police, followed by health and education professionals, social service providers, family members and friends, and members of the public [195]. In serious cases of child abuse, CYF works with the Police. In these cases the primary roles of CYF are to assess the safety and wellbeing of children and provide care and protection when this is required. The primary roles of the Police are to address the immediate safety of children and to investigate and hold to account the perpetrators [196].

Over the recent years there has been a very substantial increase in the reported number of notifications to CYF. Notifications increased from 71,927 in the year ending June 2006/07 to 153,407 in 2012/13 [197]. This was at least partly due to a new policy introduced in 2006 requiring Police to notify CYF of all instances of family violence where children were present but it probably also reflects increased public awareness of the need to protect children and increased willingness of people to contact CYF when they have concerns [198,199]. While the total number of notifications has increased there has also been an increase in the proportion of notifications that are deemed not to require further action [199]. Staff in CYF have to make difficult decisions regarding what action to take when they receive a notification of suspected child harm and there is an inevitable trade-off between managing limited resources, and avoiding stigmatising families, by taking no further action in cases perceived to be low risk and the possibility of missing cases where serious harm is occurring [200].

Data Source and Methods

Indicators

1. *Number of care and protection notifications received by Child, Youth and Family*
2. *Proportion of care and protection notifications where further assessment was required*
3. *Assessment outcome for children and young people notified to Child, Youth and Family*

Data source

Care and protection notifications received by Child, Youth and Family

Notes on Interpretation

Note 1: The number of notifications and the number requiring further assessment do not represent the number of distinct clients, as some clients have multiple notifications and assessments during any given year. Similarly, the number of assessments does not represent the number of client assessments, as some clients have multiple assessment records during a given year. In addition, as some clients have more than one type of finding during an assessment, they may appear across several categories depending on the type of finding.

Finally the number of assessment findings in a year does not directly relate to the number of notifications or assessments in a year, as there is a time lag between the need for an assessment being identified and the assessment being completed. As a consequence, the figures presented in this section may overestimate the number of children referred to CYF, or the total number found to have experienced abuse in any given year. For similar reasons, no rate data have been provided in this section.

Note 2: The numbers in this section may differ from those presented in previous NZCYES Reports as Child, Youth and Family no longer include the intakes received under court order in routine reporting (S19 of the Children, Young Persons, and Their Families Act 1989 and s132 of the Care of Children Act 2004) as they are not considered to be care and protection notifications.

Note 3: Since July 2010, Police family violence referrals that require no assessment by Child, Youth and Family have been received separately in the CYF database. However in this section, they have been included in the main analysis in order to preserve continuity with previous years.

Note 4: CYF notification data do not include any information on the ethnicity of individual children and young people, although this information is available for those requiring further assessment. In this section, ethnicity data are presented only for those for whom further assessment was required.

New Zealand distribution and trends

Number of notifications and proportion requiring further assessment

In New Zealand during 2013, a total of 148,659 care and protection notifications were received by CYF offices, with 41.6% being thought to require further assessment. The total number of notifications was a little lower than in 2011 and 2012, but the number and the proportion of notifications deemed to require further assessment were a little higher. The number of notifications requiring further assessment has increased steadily since 2004, from 35,350 to 61,877 (**Table 55, Figure 93**).

Notifications requiring further assessment by ethnicity

In New Zealand during 2004–2013, the number of care and protection notifications received by CYF that required further assessment increased for Māori and children and young people (**Table 56**). For non-Māori non-Pacific children over the same period it followed the same general pattern, but there was a small decrease from 2012 to 2013 (**Table 56**). During the 2013 financial year, 46.3% of notifications requiring further assessment were for Māori children and young people, while 42.4% were for non-Māori non-Pacific children and young people children (**Table 56**).

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 almost all referral sources generally rose during 2004–2013, much the largest increases were seen for Police family violence referrals, which increased from 3,389 in 2004 to 82,408 in 2011 before falling to 70,542 in 2013. In 2013, Police family violence referrals were the most frequent source of CYF notifications, followed by the Police (other referral types) and the health sector. The proportion of Police family violence referrals which required further assessment declined, from 70.5% in 2004 to 11.1% in 2013. While similar trends were seen for other referral sources, the magnitude of these declines was much less marked (**Table 57**).

Assessment findings for Cases Requiring Further Investigation

Of those notifications which were assessed further during 2004–2013, a large proportion (over 50% in all years except 2008, where the proportion was 49%) resulted in no abuse being found. Where abuse was found, it was most commonly emotional abuse and least commonly sexual abuse. Behavioural and relationship difficulties were the most frequent non-abuse findings (**Table 58).** Because of the nature of the reporting system, and the fact that a single child may appear in a number of abuse categories, it is difficult to determine what proportion of cases related predominantly to a particular type of abuse.

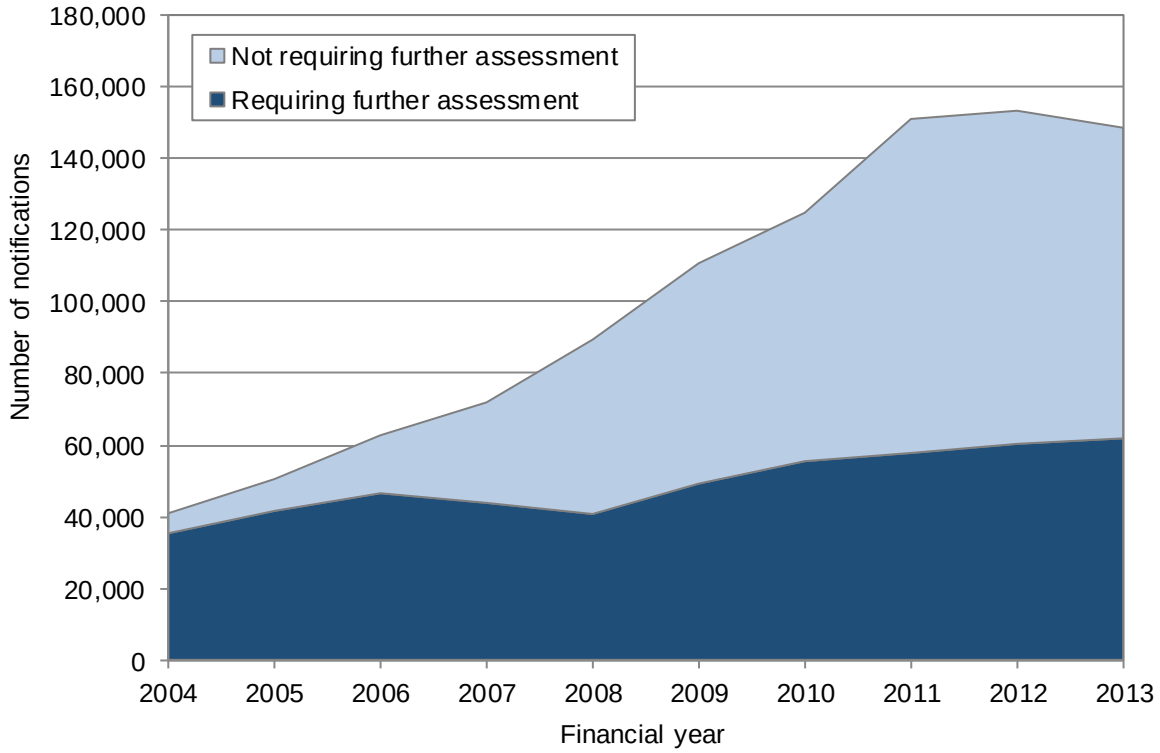
In interpreting these figures, it must also be remembered that a single child may have been the subject of multiple notifications and that there were also significant changes to the notification system during this period.

Table 55. Number of notifications received by Child Youth and Family Offices, New Zealand 2004–2013 financial years

	Total number of notifications	Number requiring further assessment	% notifications requiring further assessment
New Zealand			
2004	40,939	35,350	86.3
2005	50,488	41,599	82.4
2006	62,739	46,541	74.2
2007	71,927	43,845	61.0
2008	89,461	40,739	45.5
2009	110,797	49,224	44.4
2010	124,921	55,494	44.4
2011	151,109	57,783	38.2
2012	153,407	60,330	39.3
2013	148,659	61,877	41.6

Source: Child Youth and Family

Figure 93. Number of notifications received by Child Youth and Family offices by outcome, New Zealand 2004–2013 financial years



Source: Child Youth and Family

Table 56. Number of notifications to Child, Youth and Family requiring further assessment by ethnicity, New Zealand 2004–2013 financial years

Year	Māori		non-Māori non-Pacific		Total
	Number	Per cent	Number	Per cent	
Notifications requiring further assessment in New Zealand					
2004	12,001	33.9	20,257	57.3	35,350
2005	15,456	37.2	22,376	53.8	41,599
2006	17,730	38.1	23,847	51.2	46,541
2007	18,791	42.9	20,127	45.9	43,845
2008	18,438	45.3	17,285	42.4	40,739
2009	23,220	47.2	20,147	40.9	49,224
2010	25,676	46.3	22,906	41.3	55,494
2011	26,527	45.9	24,633	42.6	57,783
2012	27,352	45.3	26,543	44.0	60,330
2013	28,620	46.3	26,255	42.4	61,877

Source: Child Youth and Family. Note: Per cent is the percentage of the total number of notifications requiring further assessment in that year (so the percentages add to 100% across the rows)

Table 57. Number of notifications to Child, Youth and Family and proportion requiring further assessment by referrer, New Zealand 2004–2013 financial years

New Zealand									
Number of notifications									
Year	Police Family Violence	Family	Police	Health	Education	Court	Others	Unknown	Total
2004	3,389	7,192	7,311	4,739	4,888	685	12,721	14	40,939
2005	9,238	7,576	7,645	5,417	5,586	744	14,271	11	50,488
2006	19,535	7,252	8,189	5,980	5,733	772	15,265	13	62,739
2007	26,609	7,286	8,720	6,711	5,775	897	15,904	25	71,927
2008	35,445	8,360	12,737	7,851	6,845	909	17,294	20	89,461
2009	51,135	9,019	14,430	8,636	7,345	678	19,542	12	110,797
2010	57,472	9,814	17,779	9,955	7,832	838	21,214	17	124,921
2011	82,408	10,399	14,986	11,031	8,121	805	23,232	127	151,109
2012	78,960	10,285	16,701	12,521	9,487	615	24,701	137	153,407
2013	70,542	10,472	19,092	12,763	9,578	569	25,503	140	148,659
Number requiring further assessment									
2004	2,389	6,086	6,125	4,230	4,550	629	11,329	12	35,350
2005	6,367	6,313	6,105	4,752	5,055	679	12,319	9	41,599
2006	10,605	5,953	6,196	5,205	5,121	714	12,736	11	46,541
2007	10,872	5,093	5,668	5,113	4,608	790	11,685	16	43,845
2008	8,994	4,663	5,747	4,928	4,947	777	10,672	11	40,739
2009	12,280	5,358	6,601	5,838	5,525	583	13,031	8	49,224
2010	12,781	5,947	9,162	6,656	5,867	744	14,326	11	55,494
2011	12,648	5,974	10,215	6,913	6,056	688	15,222	67	57,783
2012	9,703	6,301	11,611	8,106	7,149	513	16,859	88	60,330
2013	7,829	6,463	13,476	8,648	7,411	501	17,459	90	61,877
Percent requiring further Assessment									
2004	70.5	84.6	83.8	89.3	93.1	91.8	89.1	85.7	86.3
2005	68.9	83.3	79.9	87.7	90.5	91.3	86.3	81.8	82.4
2006	54.3	82.1	75.7	87.0	89.3	92.5	83.4	84.6	74.2
2007	40.9	69.9	65.0	76.2	79.8	88.1	73.5	64.0	61.0
2008	25.4	55.8	45.1	62.8	72.3	85.5	61.7	55.0	45.5
2009	24.0	59.4	45.7	67.6	75.2	86.0	66.7	66.7	44.4
2010	22.2	60.6	51.5	66.9	74.9	88.8	67.5	64.7	44.4
2011	15.3	57.4	68.2	62.7	74.6	85.5	65.5	52.8	38.2
2012	12.3	61.3	69.5	64.7	75.4	83.4	68.3	64.2	39.3
2013	11.1	61.7	70.6	67.8	77.4	88.0	68.5	64.3	41.6

Source: Child Youth and Family

Table 58. Outcome of assessment for children and young people notified to Child Youth and Family, New Zealand 2004–2013 financial years

Year	Abuse				Non-Abuse		Abuse not found
	Emotional abuse	Physical abuse	Sexual abuse	Neglect	Behavioural or relationship difficulties	Self-harm or suicidal	
New Zealand							
2004	2,571	1,864	1,149	2,878	3,325	100	15,860
2005	4,592	2,351	1,424	4,074	4,355	173	23,388
2006	6,142	2,336	1,291	4,199	4,657	172	26,011
2007	8,256	2,274	1,194	4,486	4,461	138	22,921
2008	8,664	2,321	1,003	4,302	4,154	116	19,334
2009	10,938	2,855	1,126	4,677	4,256	106	25,486
2010	12,535	2,886	1,201	4,403	5,007	137	29,313
2011	12,711	3,253	1,514	4,813	4,958	148	30,607
2012	12,454	3,330	1,418	4,970	4,970	156	32,593
2013	12,777	3,343	1,459	5,405	5,025	204	33,845

Source: Child Youth and Family

FAMILY VIOLENCE

Introduction

The following section reviews the number of family violence investigations occurring during 2012–2013 as documented by the New Zealand Police. In interpreting these figures, it must be remembered that research suggests that police are involved in only around 10% of the family violence incidents occurring in New Zealand each year [201] so these figures need to be viewed as the "tip of the iceberg". It should also be borne in mind that trends in police statistics may be the result of public awareness campaigns and changes in the way the police recognise and record family violence incidents. Despite this, these figures provide some insights into family violence in New Zealand.

Background

Te Rito, the New Zealand Family Violence Prevention Strategy, defines family violence as:
"*a broad range of controlling behaviours commonly of a physical, sexual and/or psychological nature, which typically involve fear, intimidation and emotional deprivation. It occurs within close interpersonal relationships"* [202].

Family violence is a major problem in New Zealand. New Zealand Police statistics indicate that in 24 out of the 61 recorded homicides in 2011, the perpetrator had a family relationship to the victim [203]. In 2013 the police conducted 95,080 family violence investigations of which 37,880 had at least one offence recorded [204]. The Youth '12 survey of 8,500 secondary school students from across New Zealand (including 1,701 who reported Māori ethnicity) found that 17% of Māori students had witnessed adults in their home hitting or physically hurting a child (other than themselves) and 10% had witnessed adults in their home hitting or physically hurting each other [188].

Family violence encompasses "intimate partner violence" (IPV) where harm is perpetrated by a current or former partner or spouse. The most severe and lethal forms of family violence are predominantly inflicted by men on women and children [202]. Children are harmed both by directly witnessing IPV and by awareness that their caregiver is being harmed or threatened [205]. Having their mother killed by her partner is devastating for children, who may lose their father as well if he is convicted of homicide [206]. Children exposed to IPV are at increased risk of emotional and behavioural problems including post-traumatic stress disorder, anxiety disorders, externalising behaviour, difficulties in peer relationships, school-related problems and physical health problems [205], although not all children exposed to IPV exhibit adverse effects. Factors promoting resiliency in children exposed to IPV include self-esteem, self-efficacy, the availability of a supportive adult/parent, and friendships or other forms of community support [207]. Research indicates that, in a high proportion of families where there is IPV, children are also victims of violence. Policies and practices, therefore, need to address both of these forms of family violence rather than focussing exclusively on either women or children [208].

Data Source and Methods

Indicator
1. Number of Police Family Violence Investigations (FVI)

Data source
New Zealand Police

Definition
The Police record "Family Violence Investigations" (FVI) in their operational database where a given investigation may relate to one or more offences and/or non-offence incidents. Only one of these offences (usually the most severe) is used to categorise the investigation. Recording incidents as FVIs is at the discretion of the Police, hence these statistics only characterise the FVIs Police have chosen to undertake.

Notes on Interpretation

Note 1: Police policy defines family violence as *"violence which is physical, emotional, psychological and sexual and includes intimidation or threats of violence".* The term "family" includes parents, children, extended family members, whānau, or any other person involved in a relationship (e.g. partners, caregivers, boarders and flatmates). It does not include neighbours.

Note 2: Creating a Family Violence Investigation is an active choice made by the Police. Therefore, no inferences can be made about trends in the prevalence of family violence from these statistics. The decision to undertake an FVI is affected by a number of factors which may change over time. A single FVI might include several incidents that might or might not be related to a criminal offence (i.e. counts of FVIs are not counts of recorded offences).

Note 3: From 1 July 2012 the Police ceased producing data on recorded offences flagged as family violence. Currently Tier-1 statistics (the most important official statistics) are being developed from a new dataset that will include information about victims of crime and the relationship between victim and offender. This is expected to enhance the knowledge of family violence in New Zealand. These statistics are scheduled to become available in late 2014.

Note 4: Because District Health Board boundaries do not match Police area boundaries, the data for some Police areas might be included in figures for more than one District Health Board. New Zealand totals only include each Police Area once so are less than the aggregate total for all District Health Boards. Refer to **Appendix 7** for Police Area boundaries.

Note 5: All of the data in this section were extracted from the Police's dynamic operational database on 27 May 2014. Data in this database are subject to change as new information is continually recorded, and the data-set was still under development. Figures reported on different dates may vary due to this ongoing development, and therefore data in this report should not be compared with that in previous NZCYES reports.

New Zealand distribution

Family violence investigations where children were present

Of the 95,082 police family violence investigations which occurred in New Zealand during 2013, children were reported as being present or usually residing with the victim in 62.2% (**Table 59)**.

Table 59. Number and proportion of police family violence investigations where children were present or usually residing with the victim, New Zealand 2012–2013

Year	Number of FVIs		Percent of FVIs where children were present*
	Children present*	Total	
2012	49,954	87,647	57.0
2013	59,144	95,082	62.2

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

Family violence investigations where an offence occurred

Of the 95,082 police family violence investigations during 2013, 37,886 (39.8%) resulted in at least one offence being recorded (Table 60).

Table 60. Number and proportion of Police family violence investigations where at least one offence was recorded, New Zealand 2012–2013

Year	Number of FVIs		Percent of FVIs where children were present*
	At least one offence recorded	Total	
2012	40681	87647	46.4
2013	37886	95082	39.8

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

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%) [209].

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) [209].

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 of 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 [210] 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 2007–2011, 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 [210].

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

Introduction

The National Minimum Dataset (NMDS) is New Zealand's national hospital discharge data collection and is maintained by the Ministry of Health (the Ministry). The information contained in the dataset has been submitted by public hospitals in a pre-agreed electronic format since 1993. Private hospital discharges for publicly funded events (e.g. births, geriatric care) have been submitted electronically since 1997. The NMDS was implemented in 1993, and contains public hospital information from 1988 [211]. Information in the NMDS includes principal and additional diagnoses, procedures, external causes of injury, length of stay and sub-specialty codes; and demographic information such as age, ethnicity and usual area of residence.

The NMDS is useful for monitoring children's hospital admissions, predicting future health service demand, and planning new services and interventions. However, there are a number of issues to take into account when interpreting information from the NMDS. Many of these issues arise from regional differences in the way data are reported to, or coded in, the NMDS. These include:

1. Differences in the way DHBs report their Emergency Department (ED) cases to the NMDS and how this has changed over time.
2. The changeover from the ICD-9 to ICD-10 coding system and irregularities in the way in which diagnoses and procedures are allocated ICD codes.
3. Changes in the way ethnicity information has been recorded over time.

This Appendix considers the first two issues, while the third is considered in **Appendix 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 [212].

Admissions that meet the three hour rule are sometimes subdivided into: day cases (or day patients) where the patient is admitted and discharged (routinely/alive) on the same day, and inpatient events where the patient spends at least one (mid)night in hospital [213]. Other DHBs, however, include all cases meeting the three hour rule in their definition of an inpatient event (personal communication Ministry staff).

Note: Throughout this report, the term hospital admission has been used in preference to hospital discharge in the description of child hospitalisation.

Regional Differences in the Reporting of ED Cases

Regional variations in the way DHBs report their ED day cases to the NMDS include the following:

1. During the mid-1990's, the Starship Children's Hospital (which provided inpatient services to the Auckland and Waitemata DHBs) started reporting ED events if the total time in the ED (including waiting time) exceeded 3 hours rather than reporting only ED events where treatment time exceeded 3 hours [213]. 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 2009–2013, 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 2009–2013 data, over 85% of day case admissions for medical conditions with a social gradient in the South Island had a non-ED specialty code on discharge, as compared to only 10% in the Auckland DHB.
5. While the three hour rule has remained unchanged, to address inconsistency, the Ministry implemented a new directive in July 2009 that made it mandatory for DHBs to report ED cases meeting the three hour rule. While most DHBs (including all of the Auckland DHBs and many medium sized and smaller DHBs) were reporting their ED cases consistently prior to this time or do not appear to have changed their practice during the past decade, in a small number of DHBs there was an abrupt increase in the reporting of ED cases from 2009. In most cases, the number of additional cases reported was relatively modest, however the staggered increase in reporting from 2009 resulted in a gradual increase in the number of admissions in subsequent years.

The Ministry's Approach to Inconsistent ED Reporting

To minimise the impact of the inconsistent reporting of ED cases, the Ministry utilises a set of filters that aim to create comparability between regions, and over time, when analysing trends in hospital admission data. While these filters vary with the work being undertaken, the majority exclude short stay ED events. For example:

1. In its Hospital Throughput Reports [214], 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 [215], 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 [216] has led to a plurality of acute assessment practices around the country. As previously discussed, this includes the use of specialist paediatric emergency departments in larger centres, PAUs attached to children's wards in many regional centres, and the fast tracking of children to the general paediatric ward in some smaller DHBs. Applying the Ministry's ED day case filters in this context excludes a high proportion of the workload of the three Auckland DHBs that assess much of their acute caseload in the specialist ED setting. However, the same filters include the workload of those DHBs that undertake similar acute assessments in a ward based setting. When ED cases are excluded, paediatric admissions for medical conditions with a social gradient in the Waitemata and Auckland DHBs fall well below those of New Zealand's other DHBs.
2. The majority of medical admissions in children are for acute onset infectious and respiratory diseases of relatively short duration. Exclusion of those with a length of stay of 0 days (as per some Ministry filters) means that those children who begin their treatment late at night and are discharged in the early hours of the following morning are included as hospital admissions, whereas those who begin their treatment in the morning and are discharged in the evening are excluded, even though they may have a similar or longer length of stay. (Note: Some Ministry filters exclude admission with a length of stay of 0 or 1 day in an attempt to address this issue).
3. Historically, concerns have been expressed about the high costs of after-hours primary care [217], with some families potentially bypassing after hours services in favour of the ED, which is free. Analysis of children's ED presentations for minor medical conditions may be one way of monitoring improvements/emergent barriers in family's access to primary care (particularly in those DHBs which have been reporting their ED cases to the NMDS consistently over time). The exclusion of ED cases from time series analysis however, precludes the identification of emerging concerns in this area.

NZCYES' Approach to the Analysis of Hospital Admission Data

Given the plurality of approaches (specialist ED, PAU, general paediatric ward) to the assessment of children requiring acute paediatric care, the NZCYES has from the outset chosen to include all ED day cases in its analysis of hospital admissions for medical conditions. The NZCYES believes that this provides the best comparison of the workload of DHBs of differing sizes around the country. However, in light of its concerns about inconsistencies in the reporting of ED cases to the NMDS, the NZCYES has always included an appendix in its reports to alert readers to these issues so that trend data can be interpreted with these concerns in mind.

For injuries, the NZCYES has adopted the Ministry's practice of filtering out ED cases based on the hypothesis that the processes for injury assessments is relatively consistent around the country (e.g. children presenting to ED with a fracture may be more likely to be assessed by ED staff, or by an orthopaedic registrar in ED, than to be sent to the ward for paediatric review). On this basis, filtering out ED cases is less likely to disproportionately discount the workload of the Auckland DHBs.

Further research is required to confirm this hypothesis. However, analysis of hospital admission data for 2009–2013 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.

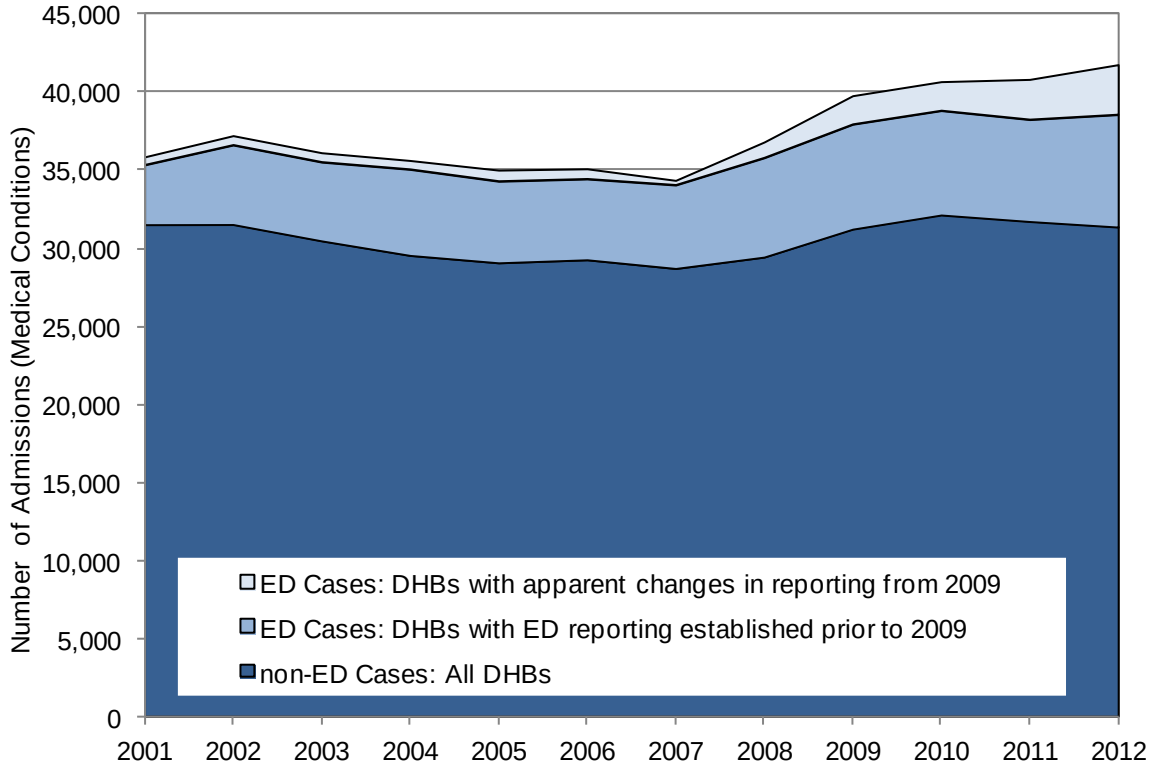
Implications for Interpretation

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 94** 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 94. 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 2000–2013



Source: National Minimum Dataset; Acute and Arranged Admissions only; ED cases are those with a health speciality code on discharge of M05–M08.

Other potential limitations to take into account when interpreting NMDS data include:

1. The inclusion of ED medical cases may lead to apparently higher admission rates for DHBs that have been reporting all of their ED cases consistently over time or that have been including triage or waiting time in the calculation of the three hour rule, when compared to DHBs that have been under-reporting their ED caseload. However, the extent to which these ED cases have been undercounted is difficult to quantify with many DHBs managing their acute assessments via PAUs or the paediatric ward. As a result, many acute assessments are assigned a M55 Paediatric Medicine specialty code on discharge (as there is no specific code for PAU) making them indistinguishable from other paediatric ward admissions.
2. Conversely, filtering out injury ED cases may have led to apparently lower injury admission rates in those DHBs who manage a higher proportion of their caseload in ED. Further, the resultant injury data are no longer representative of all types of injury presentation in children as they reflect only the more serious end of the spectrum. Finally, the filtered data are unable to provide any insights into changes in families' service access patterns (e.g. primary care vs. ED) for less serious injuries in children, thereby losing its capacity to provide an early warning of a shift in families health seeking behaviour for minor injuries.

2. Data Quality and Coding Changes over Time (ICD-9 and ICD-10)

Change Over from ICD-9 to ICD-10 Coding

From 1988 until June 1999, clinical information in the NMDS was coded using versions of the ICD-9 classification system (ICD-9 CM until June 1995, then ICD-9-CM-A until June 1999). From July 1999 onwards, the ICD-10-AM classification system has been used, although for time series analysis, back and forward mapping between the two systems is possible using pre-defined algorithms [5].

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 [218]. 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 [219]. 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 using hospital discharge data still remains a valuable and reasonably reliable proxy for measuring the health outcomes of children and young people in this country, the reader is cautioned to take into consideration the issues discussed above, when interpreting the findings outlined in this report.

APPENDIX 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 [220].

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 in **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 foetal 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 [221].

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 [221].

Data Quality Issues Relating to the National Mortality Collection

Unlike the NMDS, where information on the principal diagnosis is coded at the hospital level and then forwarded electronically to the Ministry of Health, in the National Mortality Collection each of the approximately 28,000 deaths occurring in New Zealand each year is coded manually by Ministry of Health staff. For most deaths the Medical Certificate of Cause of Death provides the information required, although coders also have access to the information contained in the NMDS, NZ Cancer Registry, LSTA, Police, Water Safety NZ and ESR [218]. 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 [222]. 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 [223].

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 [222]. 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 [223].

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 [223].

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 [222]. 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 [223]. 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 [223].

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 [222]. 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* [224] 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 [225]. 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 [224].

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* [226], 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 [227]. In 2009 Statistics NZ amended the Standard to reflect these issues [228] 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 [227].

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 [5]. In this Classification System increasing detail is provided at each level. For example [224]:

- 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 [224]. This ensures that each individual is counted only once and that the sum of the ethnic group sub-populations equals the total NZ population [223]. 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 [224]. 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 [224].

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 [6] 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 [229].
2. Research also suggests that ethnic misclassification may vary significantly by DHB [229], 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 [230]. 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 61**) [231]. Each variable represents a standardised proportion of people living in an area who lack a defined material or social resource (e.g. access to a car, income below a particular threshold), with all 9 variables being combined to give a score representing the average degree of deprivation experienced by people in that area. While the NZDep provides deprivation scores at meshblock level (Statistics NZ areas containing approximately 90 people), for the purposes of mapping to national datasets, these are aggregated to Census Area Unit level (≈1,000–2,000 people). Individual area scores are then ranked and placed on an ordinal scale from 1 to 10, with NZDep decile 1 reflecting the least deprived 10% of small areas and NZDep decile 10 reflecting the most deprived 10% of small areas [232].

Table 61. Variables used in the NZDep2006 Index of Deprivation

No	Factor	Variables in Order of Decreasing Weight in the Index
1	Income	People aged 18–64 receiving means tested benefit
2	Employment	People aged 18–64 unemployed
3	Income	People living in households with income below an income threshold
4	Communication	People with no access to a telephone
5	Transport	People with no access to a car
6	Support	People aged <65 living in a single parent family
7	Qualifications	People aged 18–64 without any qualifications
8	Owned Home	People not living in own home
9	Living Space	People living in households below a bedroom occupancy threshold

The advantage of NZDep is its ability to assign measures of socioeconomic status to the elderly, the unemployed and to children (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 [230]. 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

Most boundaries for the Police Areas in New Zealand map closely to District Health Board boundaries. **Figure 95** shows the District Health Boards as colour/shaded blocks, while Police Area boundaries are drawn as blue lines. Where there is a significant mismatch, the overlap is shown as being striped. **Figure 95** provides an overview of the Police Areas that overlap the District Health Boards.

Figure 95. Police Area boundaries compared with District Health Board boundaries

Image sources: Police Areas (as at 14/08/2014): https://koordinates.com/layer/3825-nz-police-area-boundaries/; District Health Boards (as at 2/10/2014): http://www.health.govt.nz/system/files/documents/pages/north-island.pdf and http://www.health.govt.nz/system/files/documents/pages/south-island.pdf

APPENDIX 8: METHODS USED TO DEVELOP THE CHILD POVERTY MONITOR

This appendix provides an overview of the methodology used to develop the Child Poverty Monitor that was used originally for the New Zealand Children's Social Health Monitor.

Rationale for the Child Poverty Monitor Indicators

The precursor to the Child Poverty Monitor was the Children's Social Health Monitor which arose from the work of a group of health professionals responding to the deteriorating economic conditions in New Zealand and Australia in the late 2000s. Coming from a range of organisations[1] with an interest in child health this Working Group was concerned about the impact of the recession on child wellbeing. The Group formed in early 2009 and discussed a set of indicators with which to monitor this impact: the types of indicators that might be included and the criteria by which individual indicators should be selected. As a result of these discussions, the Children's Social Health Monitor was developed, comprising two sets of indicators:

1. *To monitor prevailing economic conditions:* Ideally, indicators would capture different facets of economic wellbeing (e.g. in a recession several quarters of negative growth (*GDP*) may precede upswings in unemployment rates, which in turn will influence the number of children reliant on benefit recipients.
2. *To monitor children's wellbeing:* Ideally indicators would respond relatively quickly (e.g. months to small number of years) to family's adaptations to deteriorating economic conditions (e.g. hospitalisations for poverty-related conditions) and would provide an overview of family wellbeing from a variety of different perspectives.

The Expert Advisory Group: solutions to child poverty

In 2012, the Children's Commissioner established the Expert Advisory Group on Solutions to Child Poverty (EAG).He gave the EAG the task of providing him with realistic, pragmatic and effective solutions to address child poverty in the short term and in the longer term. In their report *Child Poverty in New Zealand: Evidence for Action* [28], the EAG recommended that governments adopt a strategic framework for addressing child poverty issues and ensuring accountability for outcomes. They stated that the framework should include the enactment of legislation requiring the measurement of child poverty, the setting of short and long term poverty reduction targets, and the establishment, monitoring and reporting of various child poverty related indicators [28].

Indicator Selection Criteria

The working group decided to gather good quality routinely collected data able to provide complete population coverage. This was to ensure the indicator set was methodologically robust and could be consistently monitored over time. A set of selection criteria were established against which candidate indicators were scored. The selection criteria included:

Conceptual Criteria

Criteria for Indicators to Monitor Prevailing Macroeconomic Conditions

1. Internationally recognised and reported measure of economic performance/wellbeing
2. Should impact on at least one facet of children's wellbeing (i.e. the pathway(s) via which it impacts on children's wellbeing should be relatively well understood, or an association between the indicator and wellbeing documented in the literature)
3. Likely to change in response to a recession (i.e. months to small number of years)

[1]The Paediatric Society of New Zealand, the Population Child Health Special Interest Group of the Royal Australasian College of Physicians, the New Zealand Child and Youth Epidemiology Service, TAHA (the Well Pacific Mother and Infant Service), the Māori SIDS Programme, the Kia Mataara Well Child Consortium, the New Zealand Council of Christian Social Services, and academics from the Universities of Auckland and Otago

Criteria for Indicators to Monitor Children's Health and Wellbeing

1. The condition is likely to be influenced by family's physical adaptations to worsening economic conditions (e.g. saving on heating to pay for food, moving in with family to save on rent)
2. The condition is likely to be influenced by family's psychological adaptations to worsening economic conditions (e.g. increased family conflict in response to financial stress)
3. The condition exhibits a socioeconomic gradient (e.g. rates are higher in more deprived areas)
4. The condition is likely to respond to changing economic conditions in the short to medium term (e.g. months to 1–2 years)

Data Quality Criteria

Data Quality Criteria (for either of the above indicator categories)

1. Needs to be routinely collected
2. Available at the national level (i.e. complete coverage of target population)
3. Updated at least annually (although quarterly preferable)
4. Availability of consistent time series data going back several years (i.e. standard and stable method of data collection)
5. Distribution can be broken down by e.g. ethnicity, socioeconomic status, region

Selection of the Baseline Indicator Set

In mid-2009 a long list of candidate indicators (selected by means of a scan of the available literature, email consultation with child health networks, and the suggestions of Working Group members) were then scored against each of these criteria by Working Group members and other health professionals (n=20). Those scoring the indicators were also asked to select a Top Five Economic and Top Five Health and Wellbeing Indicators for inclusion in the Children's Social Health Monitor. The resulting Top Five Economic and Wellbeing indicators (as determined both by criteria scoring and priority ranking) were:

Economic Indicators:

Gross Domestic Product

Income Inequality

Child Poverty

Unemployment Rates

The Number of Children Reliant on Benefit Recipients

Child Health and Wellbeing Indicators:

Hospital Admissions with a Social Gradient

Mortality with a Social Gradient

Infant Mortality

Hospital Admissions and Mortality from Non-Accidental Injury

Methodology for Developing the Hospital Admissions and Mortality with a Social Gradient Indicator

While the top five economic indicators and a number of the child health and wellbeing indicators already had established methodologies, the hospital admissions and mortality with a social gradient indicator had to be developed specifically for the Children's Social Health Monitor. The methodology used to develop this indicator is outlined below:

Hospital Admissions

In considering which conditions should be included in the analysis of hospital admissions with a social gradient, the 40 most frequent causes of hospital admission in children aged 0–14 years (excluding neonates) were reviewed, and those exhibiting a social gradient (a rate ratio of ≥1.8 for NZDep deciles 9–10 vs deciles 1–2; or for Māori, Pacific or Asian vs European children) were selected. A small number of conditions with rate ratios in the 1.5−1.8 range

were also included, if they demonstrated a consistent social gradient (i.e. rates increased in a stepwise manner with increasing NZDep deprivation) and the association was biologically plausible (the plausibility of the association was debated by Working Group members).

Inclusion and Exclusion Criteria

Neonatal hospital admissions (<28 days) were excluded on the basis that these admissions are more likely to reflect issues arising prior to/at the time of birth (e.g. preterm infants may register multiple admissions as they transition from intensive care (NICU) → special care nurseries (SCBU) → the postnatal ward), and respiratory infections/other medical conditions arising in these contexts are likely to differ in their aetiology from those arising in the community.

For medical conditions, only acute and arranged hospital admissions were included, as Waiting List admissions are likely to reflect service capacity, rather than the burden of health need (e.g. the inclusion of Waiting List admissions would result in a large number of children with otitis media and chronic tonsillitis (who were being admitted for grommets and tonsillectomies) being included, and the demographic profile of these children may be very different from children attending hospital acutely for the same conditions).

For injury admissions, filtering by admission type was not possible, as a number of DHBs admitted injury cases under (now discontinued) ACC admission codes, making it difficult to distinguish between acute and waiting list admissions in this context. In accordance with other reports produced by the New Zealand Child and Youth Epidemiology Service (NZCYES), all injury cases with an Emergency Department Specialty Code (M05–M08) on discharge were excluded as a result of inconsistent uploading of Emergency Department cases across DHBs (see **Appendix 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 (SUDI), which were then included in the coding algorithms (for both hospital admissions and mortality data). A number of deaths were also identified, which were attributed to issues arising in the perinatal period (e.g. extreme prematurity, congenital anomalies), but in order to preserve consistency with previous exclusion criteria (i.e. the exclusion of conditions arising in the perinatal period) these were not included in coding algorithms.

APPENDIX 9: DIAGNOSTIC SHIFTS IN CODING

In New Zealand, the Ministry of Health regularly updates the ICD-10-AM coding system it uses to assign diagnostic codes, in order to ensure New Zealand remains congruent with international best practice. As a consequence, since 2000 New Zealand's national health collections have sequentially used the ICD-10-AM 1st, 2nd, 3rd and 6th Editions, with the 6th Edition being in use since 1 July 2008 [211].

While the Technical Report's coding algorithms take such Edition changes into account, what is often harder to identify is changes in the way the codes themselves are assigned, either as a result of new directives to clinical coders on how to document specific conditions, or due to changes in the way clinicians diagnose clinically overlapping, ambiguous, or emerging conditions. In this Technical Report, two changes have been made to the coding algorithms previously used by the CSHM to define medical conditions with a social gradient, as a result of these issues. Specifically these changes relate to:

The Broadening of Asthma to Asthma and Wheeze

In recent years there has been a move away from diagnosing asthma in pre-school age children, with the majority of a European Respiratory Society Taskforce in 2008 "*agreeing not to use the term asthma to describe preschool wheezing illness, since there is insufficient evidence to show that the pathophysiology of preschool wheezing illness is similar to that of asthma in older children [233]".*

Figure 96 shows the large increases in hospital admissions with a primary diagnosis of wheeze (R062) that have occurred in New Zealand since this time, with almost all of these increases being in preschool aged children (0–4 years). A corresponding fall in the number of children admitted with asthma (J45–J46) has also occurred during 2010–2012, with the largest changes again being seen in pre-school age children.

As a consequence, in this year's Technical Report, Asthma (J45–J46) has been replaced with a new category, Asthma and Wheeze (J45–J46, R062), in order to minimise the impacts of this probable diagnostic shift on time series analysis.

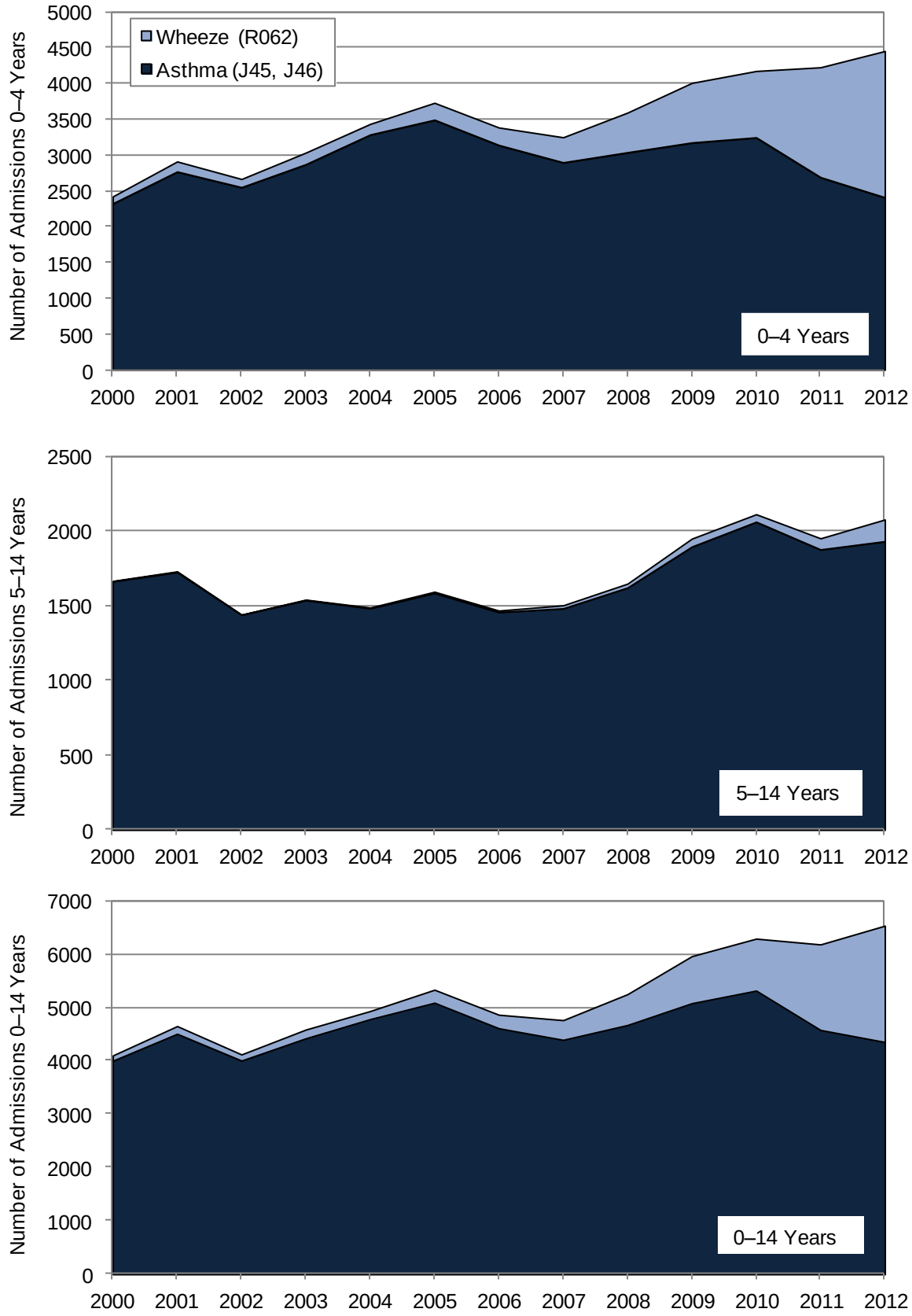
The Addition of J22 (Unspecified Lower Respiratory Infections)

J22 was not initially included in the CSHM's coding algorithms, as it was not present in ICD-9, and thus could not be used in time series analyses prior to 2000. However, there are considerable clinical similarities between J22 (Unspecified Lower Respiratory Tract Infection) and J18.9 (Unspecified Pneumonia), a code which accounts for the majority of admissions in the Monitor's current Bacterial/Non-Viral/Unspecified Pneumonia category.

Whether this diagnostic overlap has resulted in any actual diagnostic transfer between these categories remains unclear, although the number of admissions with a primary diagnosis of J22 has increased since 2007, while the number with Bacterial/Non-Viral/Unspecified Pneumonia has declined since 2009 (**Figure 97**).

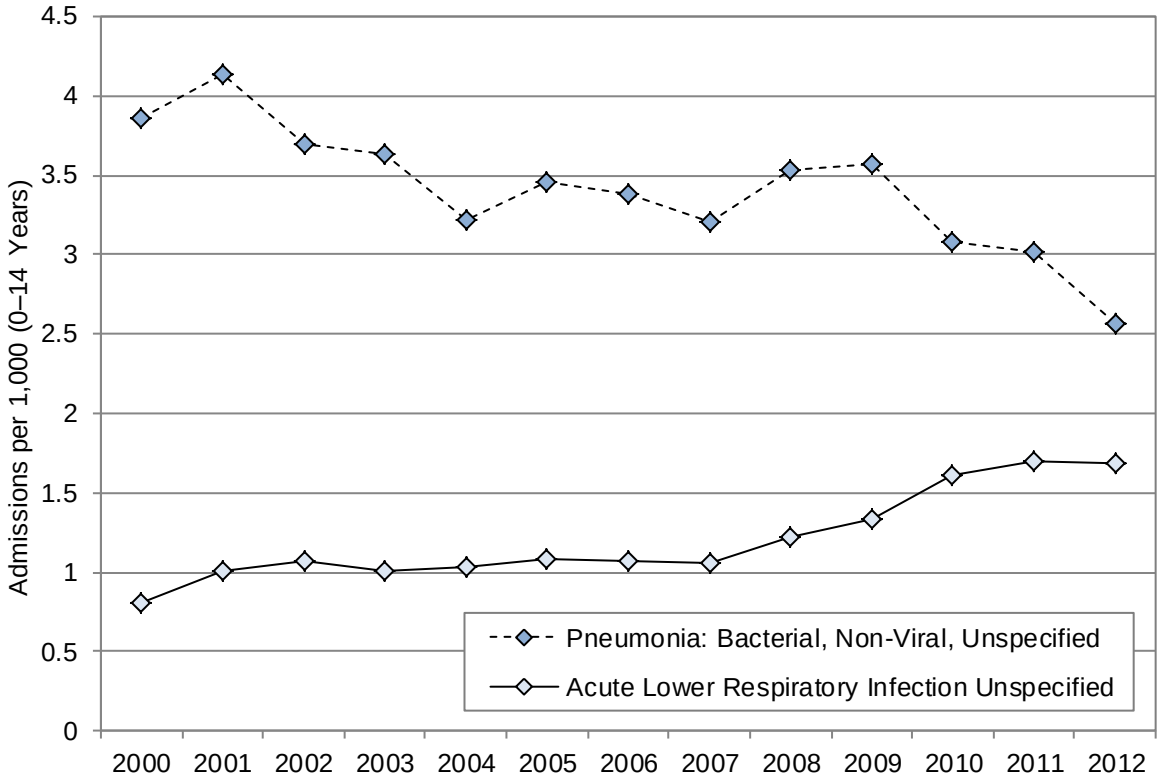
Given this uncertainty, the code J22 has been added to the Technical Report's coding algorithms. As a result, the rates presented in this report are not directly comparable to those previously presented in the CSHM.

Figure 96. Diagnostic shifts in the coding of asthma and wheeze by age group for children aged 0–14 years, New Zealand 2000–2012



Source: National Minimum Dataset

Figure 97. Hospital admissions for bacterial/non-viral/unspecified pneumonia and acute unspecified lower respiratory infections in children aged 0–14 years, New Zealand 2000−2012



Source: Numerator: National Minimum Dataset (neonates removed); Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Acute and arranged admissions only

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