

TRACKING PROGRESS ON REDUCING
CHILD POVERTY IN NEW ZEALAND

CHILD
POVERTY
MONITOR

TECHNICAL
REPORT

2015



New Zealand Child and Youth
Epidemiology Service

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Introduction

The Child Poverty Monitor and this Technical Report provide data on a set of indicators that assess aspects of child poverty in New Zealand and their implications for child wellbeing.

In it are data on income and non-income measures of poverty, including measures that reflect increasing levels of severity. Other data include indicators related to health, living conditions, education, and a selection of economic measures used to assess how well we are doing as a nation that are relevant to the wellbeing of children and their families.

The Child Poverty Monitor is a partnership comprising the Office of the Children's Commissioner, the University of Otago's New Zealand Child and Youth Epidemiology Service (NZCYES) and the J R McKenzie Trust. The purpose is to compile and share robust information on child poverty measures that are publicly available and easily accessible. Only by having the essential measures on child poverty in New Zealand compiled, published and disseminated annually can we tell how well we are progressing in effectively reducing child poverty in our nation.

This is the third edition of the Child Poverty Monitor. As in previous years, the indicators and measures presented have been generated from two sources. First, the Children's Social Health Monitor that was produced by the NZCYES from 2009 to 2012 reported on a suite of measures and indicators related to children's health and wellbeing. Second, in 2012, the Children's Commissioner's Expert Advisory Group (EAG) on Solutions to Child Poverty recommended annual reporting of specific measures that capture different aspects of child poverty. Indicators are being added each year to improve the assessment of the impact of poverty on children and their families.

Responses to previous editions of this report indicate an increasing will in New Zealand to measure whether we are reducing the proportion of children living in conditions that do not allow them to reach their potential. Regardless of the definition of poverty used, there is an increasing agreement that there are too many children living in situations where there are not enough resources to meet their basic needs. Preparation of this report has also highlighted that some of the national measures need to be more robust to provide the data needed for the future. Refinement of some measures is currently underway, and these changes are noted in this report.

The key points of the report are presented below with further detail and explanation provided in subsequent sections.

Key points

Poverty and living conditions

- In 2014, 305,000 (29%) of dependent 0–17 year olds were living in income poverty defined using a relative threshold measure of below 60% of the median income after housing costs were taken into consideration. In 2013, the percentage was 24%.
- In 2014, 245,000 (23%) of dependent 0–17 year olds were living in income poverty defined using a fixed-line threshold measure of below 60% of the 2007 median income after housing costs were taken into consideration.
- The non-income measure (NIM) indices reported by the Ministry of Social Development have been revised in recent years and the Material Wellbeing Index (MWI) and the DEP-17 Index have been developed. This makes a comparison over the last three years more complex; however, the changes will improve the ability to assess change over time in the future.
- Approximately 148,000 (14%) of dependent 0–17 year olds are living in material hardship using the threshold of $MWI \leq 9$ or $DEP-17 = 7+$.
- Defining more severe poverty for children and young people using a combination of a poverty threshold of below 60% median income after housing costs AND being in material hardship, 9% of dependent 0–17 year olds were living in households in severe poverty compared to less than 5% of the total population in 2014. An alternative measure, using a relative threshold of below 50% median income after housing costs has 21% of dependent 0–17 year olds living in severe poverty.
- Three out of five children living in current poverty live in persistent poverty. This is based on their average income over 7 years being below the average low income poverty over the same period (from Statistics NZ's Survey of Family Income and Employment (SoFIE) updated 2012).

Health and wellbeing

- The number of New Zealand babies dying in the first year of life declined from 507 deaths in 1990 to 294 deaths in 2012 but the infant mortality rate of 4.74 deaths per 1,000 live births in 2012 was higher than the average of all OECD countries.
- Sudden unexpected death in infancy (SUDI) rates fell for all ethnic groups in New Zealand between 1996 and 2012, although disparities persisted. Higher rates of SUDI were observed for infants living in areas with high scores on the NZDep2013 index of deprivation and for Māori and Pacific compared with European/Other infants. Premature birth and young maternal age were also associated with higher SUDI rates.
- Medical conditions with a social gradient include respiratory illnesses (e.g. bronchiolitis, asthma, pneumonia and other infections), gastroenteritis and skin infections. In 2012 such medical conditions with resulted in the deaths of 33 children aged 0–14 years, and injury with a social gradient resulted in 36 deaths. The most common types of fatal injury were road traffic related: as a vehicle occupant, pedestrian or cyclist. Rates of death from injury with a social gradient fell between 2000 and 2012, however rates of death from medical conditions have not changed significantly overall.
- Between 2010 and 2014 there were 205,661 hospitalisations for medical conditions with a social gradient and 45,160 hospitalisations for injury with a social gradient.
- Since 2000 there has been little change in the rate of death for children aged 0–14 years as a result of assault, abuse or neglect in recent years, and a small but *significant* fall in the hospitalisation rate for such injuries. The highest rates of assault, neglect or maltreatment are seen in the first year of life.

Education

- From 2009-2014 the proportion of students leaving secondary school with no qualification decreased from 19.2% to 13.0%. Māori and Pacific New Zealanders are less likely than European New Zealanders to achieve qualifications.

Housing

- About 16% of children live in a crowded house (defined as households requiring one or more additional bedrooms). Māori, Pacific and Asian children are *significantly more likely* than European children to live in a crowded house. Almost half of the children belonging to Pacific ethnic groups live in crowded households.
- More than a third of NZ children are living in households that spend more than 30% of their income on housing costs.

Wider New Zealand context

- From 1975–2015, average pay rates have not kept pace with rising gross domestic product.
- From 2008 the unemployment rates for Māori and Pacific New Zealanders have risen more than those for other New Zealanders. In June 2015 the unemployment rate for Māori was 12.6%, and 11.3% for Pacific New Zealanders, compared to 4.3% for European New Zealanders.
- Almost 17% of New Zealand children are reliant on benefit recipients. The percentage of children reliant on a benefit recipient tends to decline with age, from more than 20% of 1–3 year olds to less than 15% of children aged 12–16 years.

Child poverty measures

“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”¹.

In 2012 the Children’s Commissioner’s Expert Advisory Group (EAG) on Solutions to Child Poverty called for a suite of measures to capture different aspects of child poverty and report on these annually. This section of the Child Poverty Monitor contains indicators and measures that were recommended by the EAG. The following subsections present data from two key reports produced in 2015 by the Ministry of Social Development.²

The content of this section reflects the two main measures used to assess child poverty: income measures and non-income measures. In the first, two measures of income poverty are presented, namely, fixed-line and relative measures, each of which can be considered in the context of different thresholds of poverty. The Monitor includes information on two thresholds in this subsection: below 60% and below 50% of the median income. The effect of housing costs on the income as a whole is also taken into consideration.

The second approach uses non-income measures to examine material hardship. These non-income measures (NIMs) provide better descriptions of everyday life for children in households that do not have enough to meet basic needs. As recommended by the EAG, further indicators are provided that show levels of income severity and persistence using combinations of these approaches.

The measurement of the critical indicators for child poverty is still evolving, and the tools used to measure material hardship are currently being revised to ensure they can become more robust and consistent with international practice.

¹ Perry B. *Household incomes in New Zealand: Trends in indicators of inequality and hardship 1982 to 2014*. Ministry of Social Development 2015 (p69).² Perry, B., *Household incomes in New Zealand: Trends in indicators of inequality and hardship 1982 to 2014*, 2015, Ministry of Social Development, Wellington.

Child poverty: income-based measures

Low family income has been associated with a range of negative health, education, justice, labour market and social outcomes.²¹ Negative health outcomes include low birth weight, infant mortality, poorer mental health and cognitive development, and hospital admissions from a variety of causes.²² The pathways linking low family income to long term outcomes are complex, and in part may be influenced by other socioeconomic factors.²³ Research suggests that exposure to low family income during childhood and early adolescence may also increase the risk of leaving school without qualifications, economic inactivity, early parenthood and contact with the justice system.

The Ministry of Social Development uses a range of income based measures to monitor poverty, many of which use data from Statistic New Zealand's Household Economic Survey (NZHES). These measures are based on a family's disposable income (market income, less tax, plus social assistance), which have 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 income, after adjusting for housing costs. Two measures are reported here in line with the recommendations from the Solutions to Child Poverty report: a relative measure and a fixed-line measure. The relative threshold measure is calculated using the contemporary median income, i.e. it compares incomes in a given year to the median income in the same year. The fixed-line measure compares income in a given year to the median income in a reference year. The relative measure is considered useful for assessing longer term change while the fixed line measure is useful for examining short to medium term change. Income measures calculated both before and after housing costs are also considered as housing costs, which include mortgage and rental, often make up a large proportion of household costs.²

This subsection reviews the proportion of children aged 0–17 years living in households with incomes below the 60% median income poverty threshold from 1982 to 2014.

Data source and methods

Definition

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

Data source

New Zealand Household Economic Survey (NZHES $n=2,800-3,500$ households per survey) via Perry 2015.² Note: Child poverty measures are reported on by the Ministry of Social Development using NZHES data² that were reported two-yearly from 1982–1998, and three-yearly thereafter. Since 2007 income data have been reported annually through the NZHES Incomes Survey. The full NZHES (including expenditure data) remains three-yearly. For more detail on methodology see Perry 2015.²

Interpretation

Note 1: Child poverty measures traditionally compare a household's income to the national median rather than the mean. 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.

Note 2: Relative 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 contemporary 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. As the median income in 1998 was similar to 1982, 1998 is used as the reference year for fixed-line poverty calculations back to 1982 as well as forward from 1998 to 2007. By 2007, the median was 16% higher than in 1998 and by 2009 26% higher, and the reference year was changed to 2007.² Both relative and fixed-line measures can be calculated before or after taking housing costs into account.

Note 3: Most income poverty measures use equivalised disposable household income – the after tax household income adjusted for family size and composition.

Children living in income poverty in New Zealand

In 2014 in New Zealand, 305,000 dependent children aged 0–17 years were living in relative income poverty using the relative measure of below 60% of the contemporary median income, after housing costs (**Table 1**). Using the fixed-line measure (below 60% of the 2007 median income), 245,000 (23%) of dependent children aged 0–17 years were living in income poverty in 2014 (**Table 1**). The number and percentage of children in income poverty is higher than reported in 2013 for both measures.

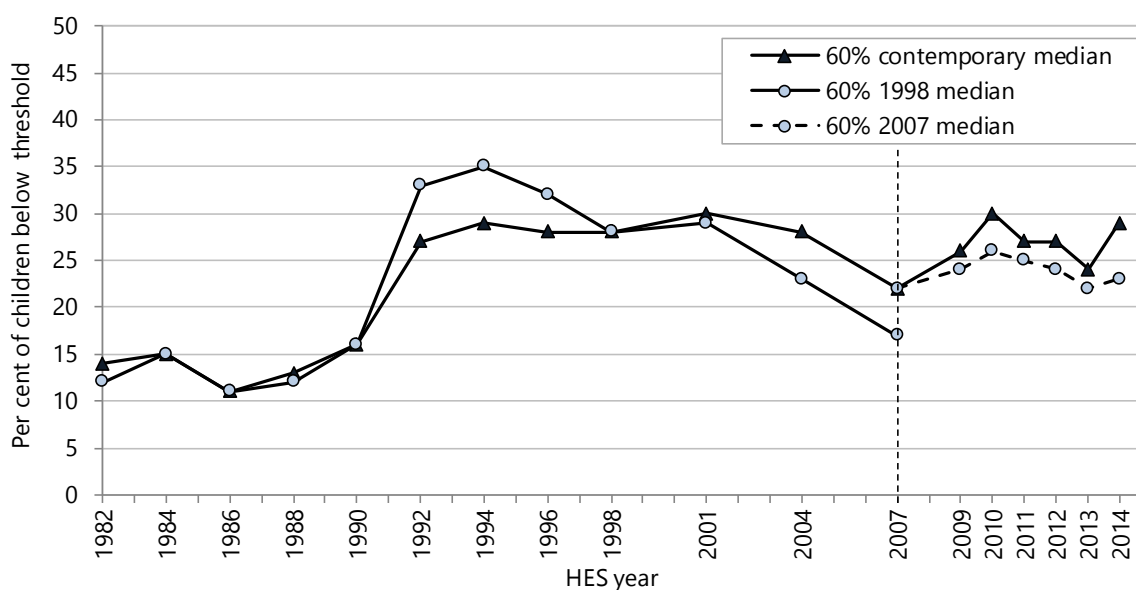
Both relative and fixed-line measures show the rapid rise in child poverty in New Zealand during 1990–1992 that has been attributed to rising unemployment and cuts made to benefits in 1991.² These benefit cuts disproportionately reduced incomes for beneficiaries compared with changes in median income. During 1992–1998, child poverty as measured by the fixed line threshold declined as a result of falling unemployment with the incomes of those around the poverty line rising 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 rise, however, and the percentage of child poverty at this threshold has remained higher on both relative and fixed-line measures.

Table 1. Number and percentage of dependent children aged 0–17 years living below various poverty thresholds, New Zealand 2001–2014 NZHES selected years

HES year	Before housing costs		After housing costs					
	<60% contemporary median		<50% contemporary median		<60% contemporary median		<60% 2007 median	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
2001	250,000	24	215,000	21	310,000	30	380,000	37
2004	265,000	26	200,000	19	285,000	28	320,000	31
2007	210,000	20	175,000	16	240,000	22	240,000	22
2009	230,000	21	210,000	20	280,000	26	255,000	24
2010	250,000	23	210,000	20	315,000	30	275,000	26
2011	235,000	22	210,000	20	290,000	27	270,000	25
2012	225,000	21	215,000	20	285,000	27	255,000	24
2013	215,000	20	205,000	19	260,000	24	235,000	22
2014	250,000	24	220,000	21	305,000	29	245,000	23

Source: Perry 2015², derived from Statistics New Zealand Household Economic Survey (HES) 1982–2014

Figure 1. Dependent children aged 0–17 years living below the 60% income poverty threshold (relative and fixed-line) after housing costs, New Zealand 1982–2014 NZHES years



Source: Perry 2015², derived from Statistics New Zealand Household Economic Survey (HES) 1982–2014

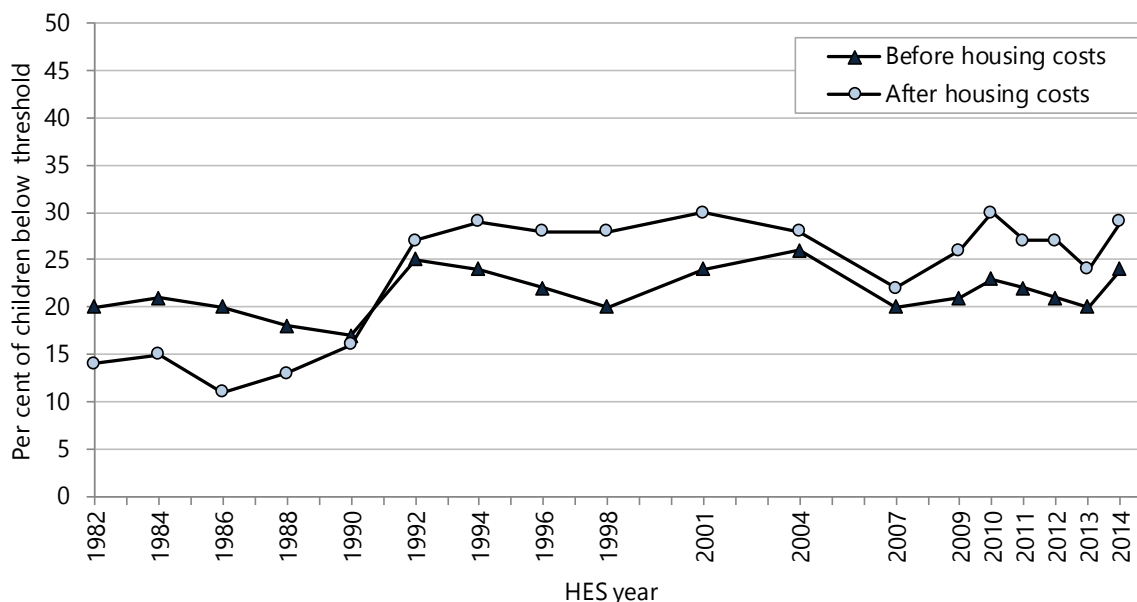
Figure 1 charts the percentage of children in New Zealand living below the 60% income poverty threshold over the period 1982–2014 (relative and fixed-line). The decline in poverty rates from 2004 to 2007 resulted from the Working for Families package.²⁴ Between 2007 and 2010 child poverty rates increased (reflecting the time of the global financial crisis), then declined, so that in 2013 the rates were nearly equal to those in 2007. There has been a rise in the proportion of dependent 0–17 year olds living in income poverty using the threshold of less than 60% median income for both relative and fixed-line measures from 2013 to 2014 (**Figure 1**).

Before and after housing costs (BHC and AHC)

Housing costs can be a substantial component of a household's expenditure. **Figure 2** shows the proportion of children living in households below the relative poverty threshold (<60% of contemporary median) before and after housing costs have been accounted for.

Housing costs in 2012 accounted for a higher proportion of household expenditure for low-income households than such costs in the 1980s. Perry has noted that the income-related rental policies introduced in 2000, along with later changes to accommodation supplements, helped reduce housing expenditure for some low income households. These changes contributed to reductions in AHC child poverty from 2001–2007. There were no further policy changes during 2007–2012 and maximum rates of assistance remained fixed although housing costs continued to increase.² This resulted in increases in the AHC child poverty rates during 2007–2010 (**Figure 2**).

Figure 2. Dependent 0–17 year olds living below the 60% income poverty threshold (relative) before and after housing costs, New Zealand 1982–2014 NZHES years



Source: Perry 2015³, derived from Statistics New Zealand Household Economic Survey (NZHES) 1982–2014

Patterns over time

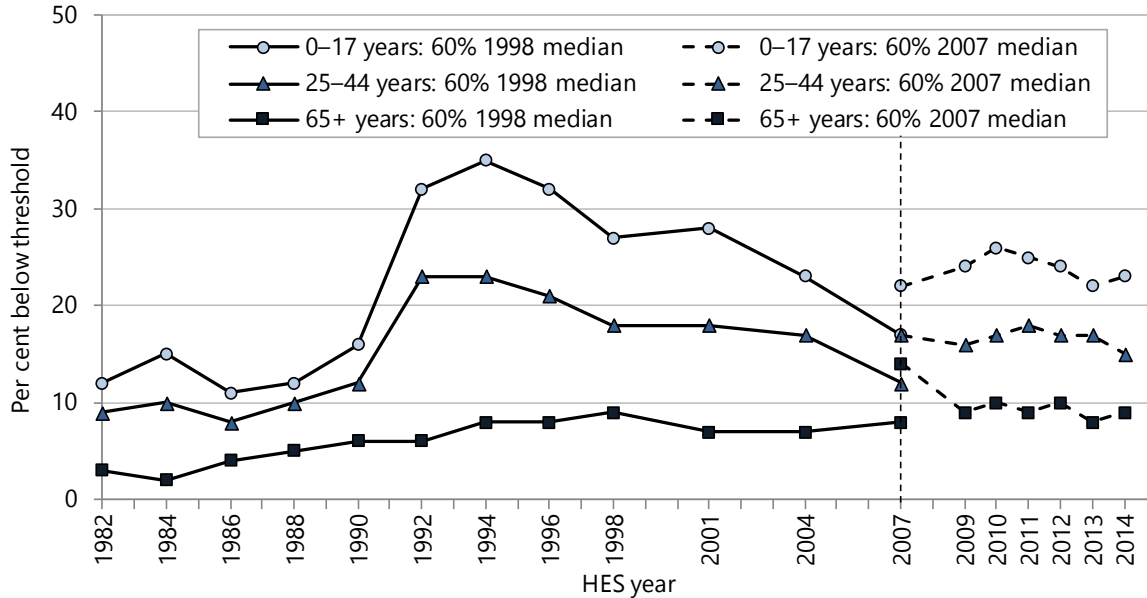
Child poverty and demographic factors

This subsection contains information on patterns of income poverty for children in relation to age, household type, number of children in the household, work status of the adults and ethnicity. The data are from NZHES 1984–2014 found in Perry 2015.²

In 2014, children aged 0–17 years were two and a half times more likely to be in poverty than those aged 65+ years. During the whole period 1982 to 2014, poverty rates 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 3**). In 2014 percentages were 23% for 0–17 year olds and 9% for those aged 65+.

Figure 3. Population living below the 60% income poverty threshold (fixed line) after housing costs by selected age-group, New Zealand 1982–2014 NZHES years

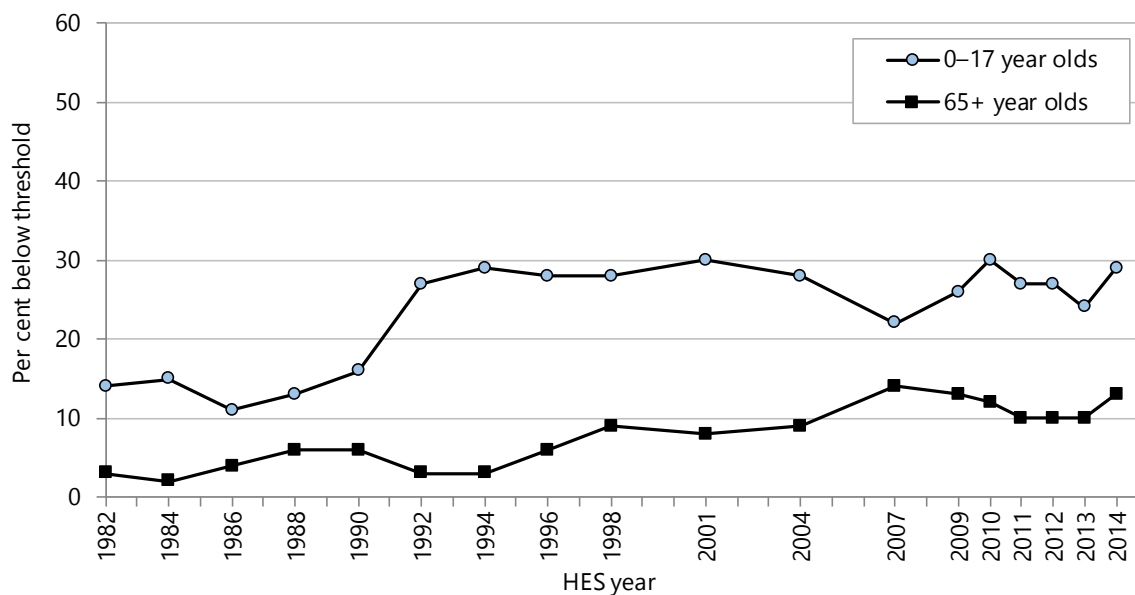


Source: Perry 2015², derived from Statistics New Zealand Household Economic Survey (NZHES) 1982–2014

Figure 4 uses the relative 60% median income threshold to compare the 0–17 year olds with those 65+ years. In 2007, their percentages were 22% and 14% respectively, but subsequently the difference increased again. For both age groups, the rate rose from 2013 to 2014. Note that the 65+ group receive government superannuation.

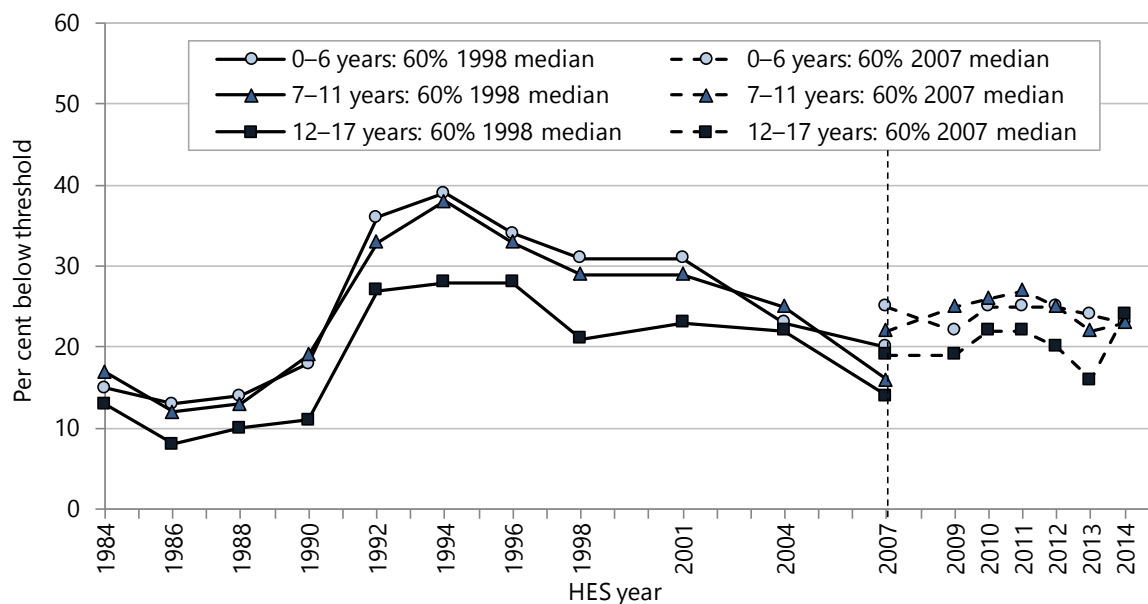
The NZHES data show less difference between the age groups within the 0–17 year old. However, income poverty rates for younger children (0–6 years and 7–11 years) were generally higher than for older children (12–17 years) (**Figure 5**).

Figure 4. Population living below 60% income poverty threshold (relative) after housing costs by selected age groups, New Zealand, 1982–2014 NZHES years



Source: Perry 2015², derived from Statistics New Zealand Household Economic Survey (HES) 1982–2014; Care is needed as in the short term, the proportion in relative poverty will rise as the median income increases (conversely in a recession, it will fall when the median income falls).

Figure 5. Dependent children aged 0–17 years living below the 60% income poverty threshold after housing costs by age, New Zealand 1984–2014 NZHES years



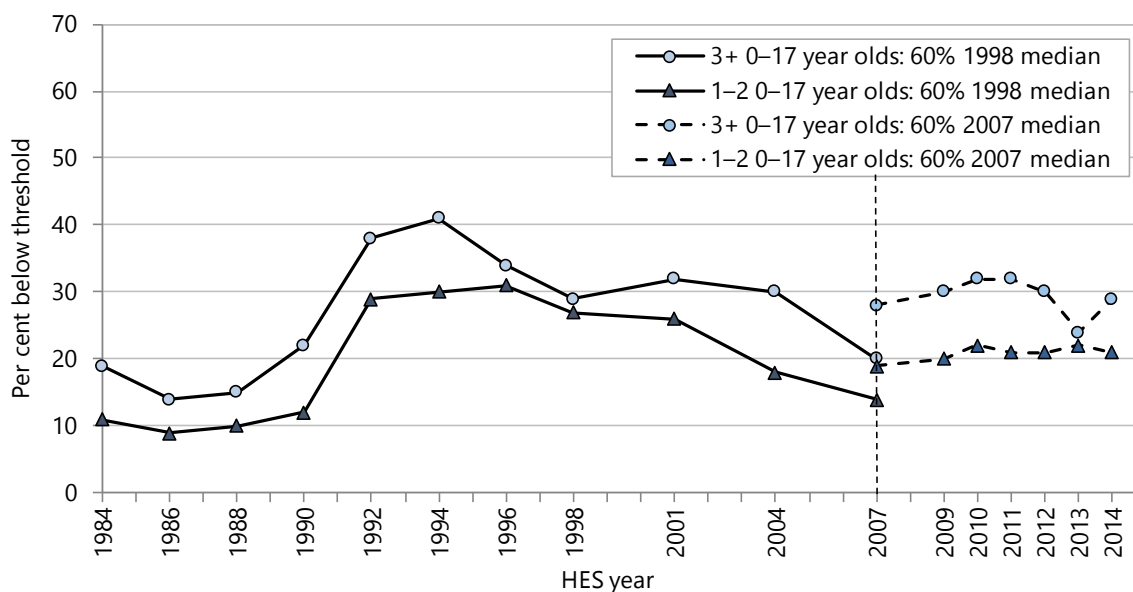
Source: Perry 2015², derived from Statistics New Zealand Household Economic Survey (HES) 1982–2014

Household factors

Child income poverty rates for households with three or more children were consistently higher than for those with one or two children (**Figure 6**).

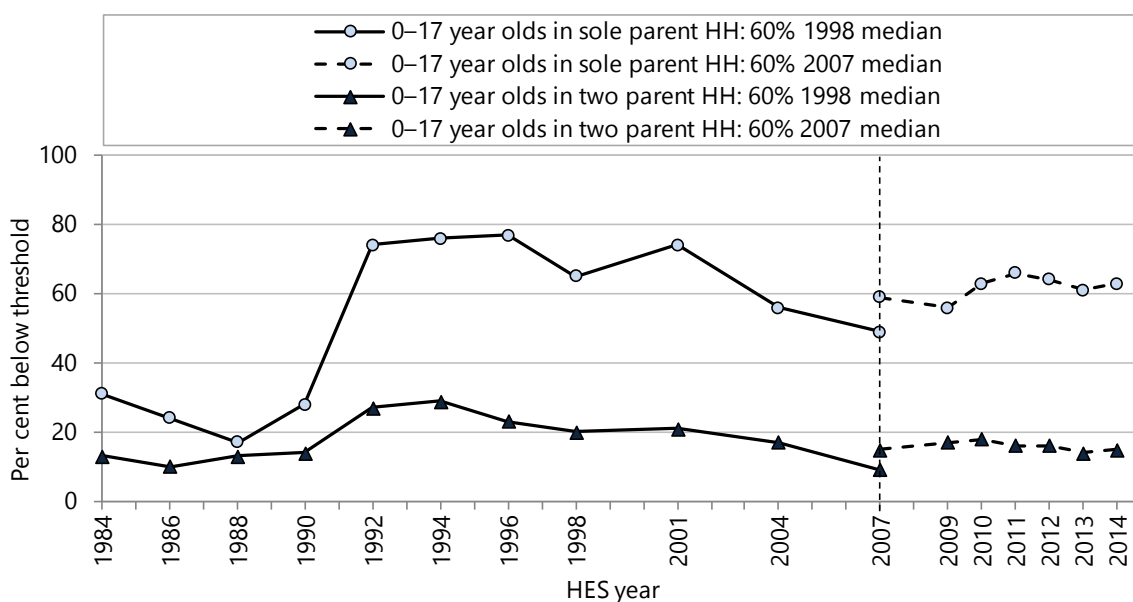
For the years 2011 and 2014, on average, 64% of children living in sole parent families were living in income poverty compared to 15% of children of two parent families (**Figure 7**).

Figure 6. Dependent children aged 0–17 years living below the 60% income poverty threshold, after housing costs, by number of children in household, New Zealand 1984–2014 NZHES years



Source: Perry 2015³, derived from Statistics New Zealand Household Economic Survey (HES) 1984–2014

Figure 7. Dependent children aged 0–17 years living below the 60% income poverty threshold after housing costs by household type, New Zealand 1984–2014 NZHES years



Source: Perry 2015², derived from Statistics New Zealand Household Economic Survey (HES) 1984–2014

Averaging the proportions over the years 2011 to 2013, the majority of children lived in two parent families (76%) compared to 16% in sole parent families on their own. In addition, 53% of children in poverty were in sole parent families and 47% in two parent households. Children living in multi-adult family households have lower poverty rates than those living in sole parent households.²

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 showed little change from 1980s levels.²

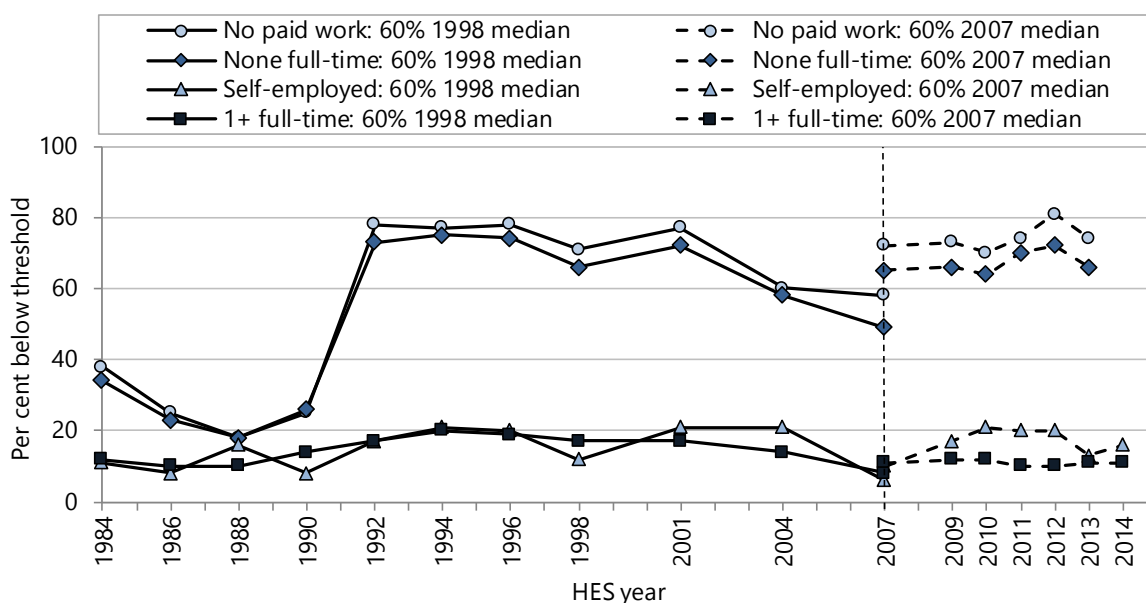
Work status of adults in household

From 2011 to 2013, on average, around 37% of children living in households below the fixed line <60% median poverty threshold AHC came from families with adults in paid work (down from one in two (52%) in 2004 before Working for Families) while 63% were in families reliant on a benefit income.²

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.² In 2014, the difference was even greater—nearly six times higher for children in households where no adults were in paid work.²

Between 1988 and 1992, poverty rates for children in households with no adults in paid work, or where no adults worked full-time increased rapidly compared to those in households with working or self-employed adults. The 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 8**).

Figure 8. 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 1984–2014 NZHES years



Source: Perry 2015², derived from Statistics New Zealand Household Economic Survey (HES) 1984–2014

Ethnicity

Poverty rates for Pacific and Māori children have been reported as being consistently higher than for European children.² Over the three years 2012–2014, on average, around 33% of Māori children and 28% of Pacific children lived in poor households, compared to an average of 16% of European children (using the AHC 60% fixed-line measure).² The higher poverty rates seen in Māori children potentially reflect the relatively high proportion of Māori children living in sole parent beneficiary households (during 2007 to 2011 around 43% of domestic purpose benefit (DPB) recipients were Māori). On average, during 2012 to 2014, just under half (46%) of children living in poverty were Māori or Pacific, using the AHC 60% fixed line measure.²

There are limited analyses by ethnic group reported in the NZHES as the NZHES has relatively small sample sizes for Māori, Pacific and Other ethnic groups which means no time series data are available for ethnicity.²

Child Poverty: Material Hardship

A major issue when measuring child poverty relates to the use of household income as an indirect measure of living standards. The validity of this has been questioned, especially in relation to international comparisons.³ Sets of non-income measures (NIMs) have been developed to provide non-income based measures of living standards, and these are used to monitor material hardship in New Zealand and other countries including the UK, Ireland, Australia and Europe. The NIMs provide insight into what hardship looks like for everyday life by indicating families' actual living standards, including their ability to keep the house warm in winter, to afford meat and fresh fruit and vegetables, to replace worn out shoes and clothing, visit the doctor, have broken appliances fixed and cope with unexpected demands on the budget.³

There is no definitive point at which people are in hardship or not. The Child Poverty Monitor provides an indicative threshold, but it also contains data on a range of thresholds of material hardship to reflect the spectrum of hardship from less to more severe.³ The range used utilises the DEP-17 scores and the Material Wellbeing Index (MWI) both of which have been developed recently for the Ministry of Social Development to improve New Zealand's ability to measure material hardship.

This section presents two sets of data. The first is data that are gathered in the New Zealand Household Economic Surveys (NZHES) and analysed by Perry using the MWI, and DEP-17 thresholds. These data providing insights into children's exposure to hardship. The second dataset is the information provided by analysis of the 2008 Living Standards Survey (LSS) data using the recently developed DEP-17 thresholds. Although last conducted in 2008, the LSS continues to be the most recent survey to include child-specific items which can be used to measure children's experience of material hardship.

New Zealand Household Economic Surveys

The non-income measures of hardship reported here come from data collected in the New Zealand Household Economic Survey (HES). They relate to items that most New Zealanders view as essential to an adequate standard of living. While going without a small number of these items do not constitute hardship, experiencing multiple 'enforced lacks' and 'economising a lot' indicates material hardship. The items included in the NZHES have been modified over time, reflecting the changes in what is considered essential, and in the last year further modifications have been made to the indices used to report these data. To provide data most comparable to previous reports, hardship has been defined using Economic Living Standards Index (ELSI) and $MWI \leq 9$ (which is equivalent to 7+ on DEP-17).³ Further details, and the rationale, for these indices are given in the 'Data Source and Methods' box below and in Appendix 6.

Data source and methods

Definition

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

Data sources

1. A time series was constructed using non-income measures (NIMs) from Statistics New Zealand's Household Economic Surveys (HES). Child poverty measures are reported by the Ministry of Social Development using NZHES data with NIMs data being reported in 2007 and annually from 2009. ($n=2,800-3,500$ households per survey).³ For more detail on NIMs see Appendix 6 and for the methodology see Perry 2015.³

The index used for measuring material hardship has changed.

- From 2006–07 to 2011–12: 25 NIM items were collected using the Economic Living Standards Index (ELSI) short-form. The material hardship threshold was determined as 6 out of the 16 items used to calibrate the measure.
- From 2012–13: 29 NIM items were collected from which the Material Wellbeing Index (MWI) and DEP-17 were constructed. The MWI index retained 13 of the 25 items from the ELSI and added 11 new ones. The threshold reported is $MWI \leq 9$ (which is equivalent to 7+ on DEP-17). A DEP-17 score is the number of deprivation items a household identifies out of 17 items. The MWI is a composite index combining measures of “enforced lacks” with measures of “freedoms enjoyed”. An MWI of 1 reflects the most severe hardship and 10 the least.

2. The Living Standards Survey (LSS) 2008 undertaken by the Ministry of Social Development (MSD) contained information from 5,000 households on material circumstances, including ownership and quality of household durables, their ability to keep the house warm, pay the bills, have broken down appliances repaired, and pursue hobbies and other interests. Material hardship was defined in the LSS as having a score of four or more “enforced lacks” from a list of 14 items on the material deprivation index.

Notes

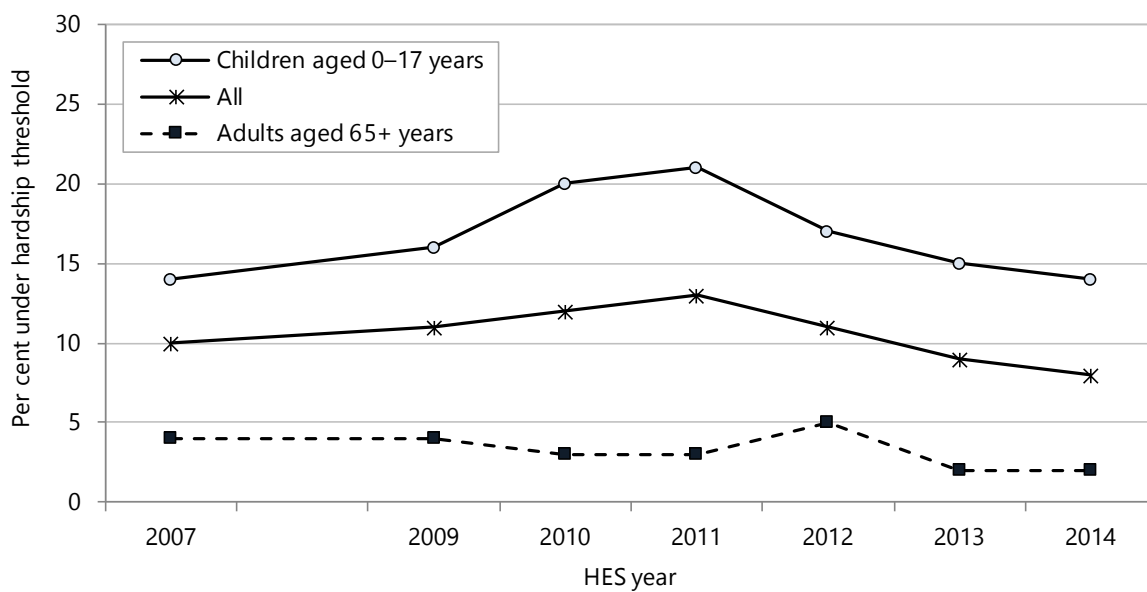
1. There is no on-going ELSI time series, but the MWI series begins from 2012–13. Because items are common to earlier and later datasets, Perry considers there is sufficient commonality to have a ‘good-enough’ index that will show the shape of the trend line from 2006–07 to 2013–14.³ In the future DEP-17 will also be reported by MSD and its rates are expected to be similar to the MWI rates.
2. The $MWI \leq 9$ is equivalent to a threshold of 7+ in DEP-17 and is based on previous thresholds used in New Zealand and those used internationally. See Perry (NIM, 2015) for a detailed description of the derivation of MWI and DEP-17 and their comparability. Also see Appendix 6.
3. There is not a definitive line below which children can be deemed to be in material hardship. The context in which families live influence how enforced lacks and economising affects the measure of hardship. The new indices provide a range of severity that better reflects the complexity of children's experience of hardship.
4. The MWI also has a short form. Its 9 items are described in Appendix 6.

Living in material hardship by age and income (NZHES data)

Perry's report on non-income measures utilises a severity threshold of $MWI \leq 9$, which relates to measures used previously in New Zealand and is comparable to measures used in other countries. This section uses this threshold as an indicative measure in the following data taken from the NZHES survey data from 2007–2014. **Figure 9** shows that at a $MWI \leq 9$ severity threshold, the percentage of material hardship was consistently higher for children aged 0–17 years than for all ages or for older groups. The proportion of children aged 0–17 years in material hardship at this level of severity rose from 16% in 2009 to 21% in 2011, before falling to 17% in 2012 and reaching 14% in 2014. The lowest hardship rates were among those aged 65+ years (**Figure 9**).

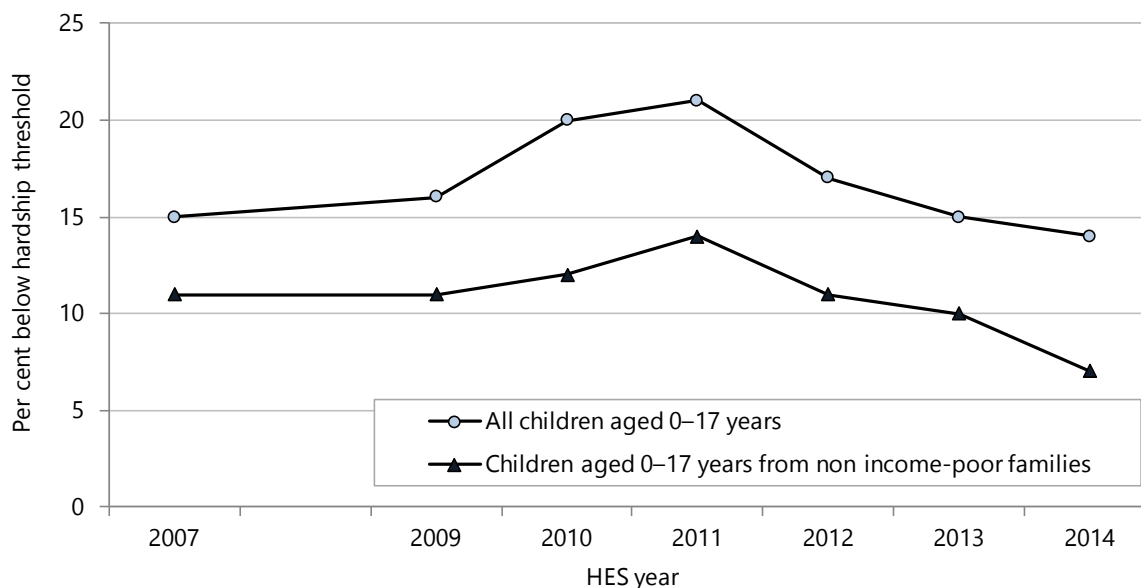
Children can experience material hardship whether their families are above or below the income-poverty threshold, however, a lower proportion of children from non income-poor families (those with a family income above the 60% poverty threshold) lived in material deprivation than did New Zealand children overall (**Figure 10**). The percentage dropped more for children in non-poor families between 2013 and 2014 with 7% of children from non-poor families being under the hardship threshold compared to 14% of all children. However, 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.³

Figure 9. Children and young people aged 0–17 years and selected sub-groups living in material hardship, New Zealand 2007–2014 NZHES years



Source: Perry 2015 derived from Statistics New Zealand Household Economic Survey (HES) 2007–2014; Note: Hardship defined using Economic Living Standards Index (ELSI) and Material Wellbeing Index, MWI ≤ 9 which is $\equiv 7+$ on DEP-17. See Methods box for further detail.

Figure 10. Children and young people aged 0–17 year living in material hardship by family income category, New Zealand, 2007–2014 NZHES years



Source: Perry 2015² derived from Statistics NZ Household Economic Survey (HES) 2007–2014; Hardship defined using Material Wellbeing Index (MWI ≤ 9 which is $\equiv 7+$ on DEP-17), see Methods for further detail. Non income-poor families are those with an income above the 60% threshold.

DEP-17 and 2008 Living Standards Survey

In the Living Standards Survey of 2008, respondents provided information about themselves and others in their economic family unit including information on specifically child related items.²⁵ **Table 2** provides an overview of the day to day experience of children who experience hardship using the DEP-17 index on the data from the Living Standards Survey. Additional child specific items not included in the calculation of the DEP-17 score have been listed to highlight experiences of children living in households with differing experiences of material deprivation. It suggests that 18% of children at that time lived in families that scored 7+ items on DEP-17 (\equiv MWI ≤ 9). This is made up of 8% that had a DEP Score of 7–8, 4% that had a score of 9–10, and 6% that had a score of 11+.

When broken down by individual item children experiencing material hardship (those living in households with DEP-17 scores of 7+) 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. For example, 26% of children whose families had a DEP-17 score of 7+ continued to wear worn out shoes or clothing, while 39% had major difficulty keeping the house warm in winter (**Table 2**).

Table 2. Restrictions experienced by children by the deprivation score of their family (DEP-17 score), based on the New Zealand Living Standards Survey 2008

DEP-17 score	All	0	1	2	3-4	5-6	7-8	9-10	11+
Distribution of children (6-17yrs) across DEP-17 (%)	100	36	14	12	16	7	6	5	5
Distribution of children (0-17yrs) across DEP-17 (%)	100	33	14	11	16	10	8	4	6
Enforced lacks of children's items									
Friends to birthday party	7	0	0	2	2	10	14	25	50
Friends over for a meal	6	0	0	2	4	12	7	21	40
Waterproof coat for each child	8	0	0	3	6	12	18	25	54
Warm winter clothes for each child	4	0	0	0	0	0	7	18	36
Two pair strong/sturdy shoes for each child	8	0	2	5	5	7	17	39	44
Separate bed for each child	4	0	0	0	4	7	7	11	28
Separate bedrooms for children of opposite sex (10+ years)	8	0	2	5	5	15	15	9	39
All school uniform items required by the school	4	0	0	0	0	4	11	12	33
Economising 'a lot' on children's items to keep down costs to enable other basic things to be paid for									
Continued with worn out shoes/clothes for the children	9	0	0	3	8	11	26	36	60
Bought second-hand clothing instead of new	16	1	10	10	17	24	43	47	69
Postponed child's visit to dentist	3	0	0	0	1	5	15	5	23
Postponed child's visit to doctor	3	0	0	0	0	3	12	9	24
Did not pick up prescription for children	2	0	0	0	0	0	12	2	12
Child(ren) went without glasses or contact lenses	2	0	0	0	2	2	4	8	20
Unable to pay for school trip	4	0	0	0	0	4	16	11	36
Went without music, dance, kapa haka, art, swimming, etc	10	2	0	4	8	13	32	33	48
Involvement in sport had to be limited	9	0	0	2	5	16	30	28	45
Made do with very limited space for children to study/play	9	0	2	8	9	13	23	36	45
Multiple restrictions									
4+ out of 18	11	0	0	0	3	14	35	43	77
5+ out of 18	8	0	0	0	0	11	30	29	60
6+ out of 18	6	0	0	0	0	3	22	18	54
Children's serious health problems reported by respondent (6-17 years)									
Serious health problems for any child in the last year*	29	22	22	30	29	36	39	31	56
Enforced lacks, economising 'a lot' or financial stress reported by respondent in child's family (0-17 years)									
Meal with meat, fish or chicken at least each second day	3	0	0	0	0	2	6	15	86
Keep main rooms warm	9	0	3	3	8	12	14	33	46
One week's holiday away from home in last year	33	9	25	31	42	55	55	63	86
Cut back or did without fresh fruit and vegetables ('a lot')	14	0	0	7	12	17	43	52	79
Postponed visit to doctor ('a lot')	14	0	0	9	12	32	43	56	72
Delayed repair or replacement of appliances ('a lot')	20	0	2	13	17	28	54	69	84
Received community help in last 12 months ('> once')	8	0	2	2	5	12	25	26	46
Pawned/sold something to meet everyday costs	8	0	0	5	5	10	22	35	46
Not enough income to meet basics	26	4	11	19	33	44	49	74	86
Housing condition and local community safety									
Overall physical condition of house (poor/very poor)	7	0	3	4	5	9	25	20	35
Difficult to keep house warm in winter (major problem)	22	7	14	17	24	30	39	59	71
Dampness or mould (major problem)	17	5	7	14	18	26	36	51	56
Crime or vandalism in the area (major problem)	11	6	5	9	10	13	19	23	36

Source: NZ 2008 Living Standards Survey²⁵ from Perry, 2015³; Note: * For example: diabetes, asthma, mental health problems or learning difficulties

Family and personal characteristics

Material hardship is experienced differently by different families depending on their circumstances, however, where there is not enough resources to meet the family needs, children can be negatively affected.

Table 3 indicates the rates of material hardship and severe hardship among children for DEP-17 7+ (equivalent to MWI ≤ 9) and the more severe hardship DEP-17 score of 9+ (equivalent to MWI ≤ 5). The rates are higher for children in:

- Maori and Pacific families compared to those in European and Other families
- Families with three or more children compared to families with one or two
- Sole parent families compared to two parent families
- Families receiving a benefit compared families with income from paid work.

Table 3. Rates of material hardship and composition of 0–17 year olds in hardship for by DEP-17 scores using data from Living Standards Survey 2008

Hardship rates			Composition		
What percentage of this group of children is in hardship using different thresholds?			What percentage of all children in hardship (using a given threshold) are in this group/cell?		
Index: DEP-17	7+	9+	Index: DEP-17	7+	9+
Family type			Family type		
Sole parent	40	27	Sole parent	53	65
Two parent	12	5	Two parent	47	35
Main income source for parent(s)			Main income source for parent(s)		
Benefit (no movement off or onto benefit)	52	35	Benefit (no movement off or onto benefit)	44	54
Some movement	35	23	Some movement	10	12
Paid work (no main benefit income)	11	5	Paid work (no main benefit income)	46	35
Number of children in household			Number of children in household		
1	17	9	1	21	21
2	15	8	2	34	32
3	20	11	3	24	24
4+	28	16	4+	22	23
Ethnicity (total)			Ethnicity (total)		
European	14	8	European	41	35
Maori	33	19	Maori	31	33
Pacific	43	30	Pacific	22	28
Other	12	4	Other	7	6

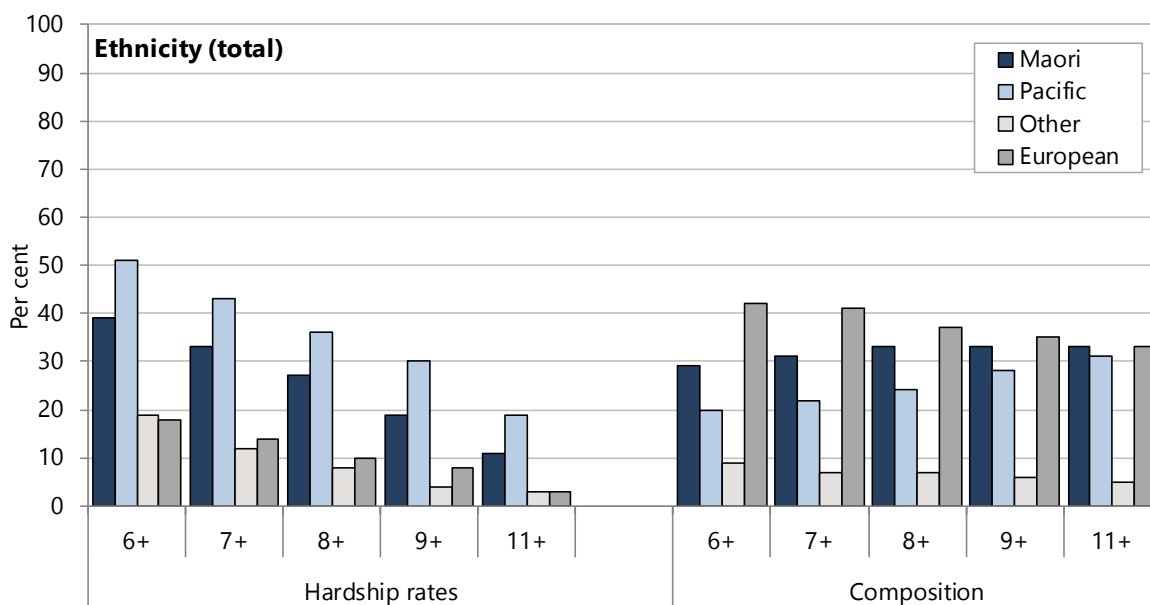
Source: Perry 2015: Data from Living Standards 2008; Threshold DEP-17, 7+ and 9+ items out of 17 items.³

Figure 11 to Figure 14 present the range of thresholds from the DEP-17 and show the continuum of material hardship from the less severe end (6+ items out of 17) to very severe hardship end (11+ items). These data are from the LSS 2008 data. Increasing DEP-17 score indicates increasing severity of material hardship. The graphs depict how the proportion of children affected differs depending on the question. The hardship graphs address the question: “what percentage of the selected group of children are in hardship?” The composition graphs address the question: “what percentage of all children in hardship are in this group?” Data show the disparity for the following: ethnicity, family type, number of children and the working status of the adults in the household.

Ethnicity

There was disparity between ethnic groups regarding children in hardship with 51% of Pacific children at the less severe threshold of 6+ and 19% at the most severe end of hardship (11+) compared with 39% of Māori children at 6+ and 11% at 11+. European and Other ethnicities children in hardship were lower at 18-19% at 6+ and 3% at 11+. The composition of the group “all children in hardship” was 42% European, 29% Māori and 20% Pacific at the 6+ threshold. This changed with increasing severity of material hardship and at the 11+ threshold the composition of ‘all children in hardship’ was 33% Māori, 31% Pacific and 33% European.

Figure 11. Children in hardship by ethnicity

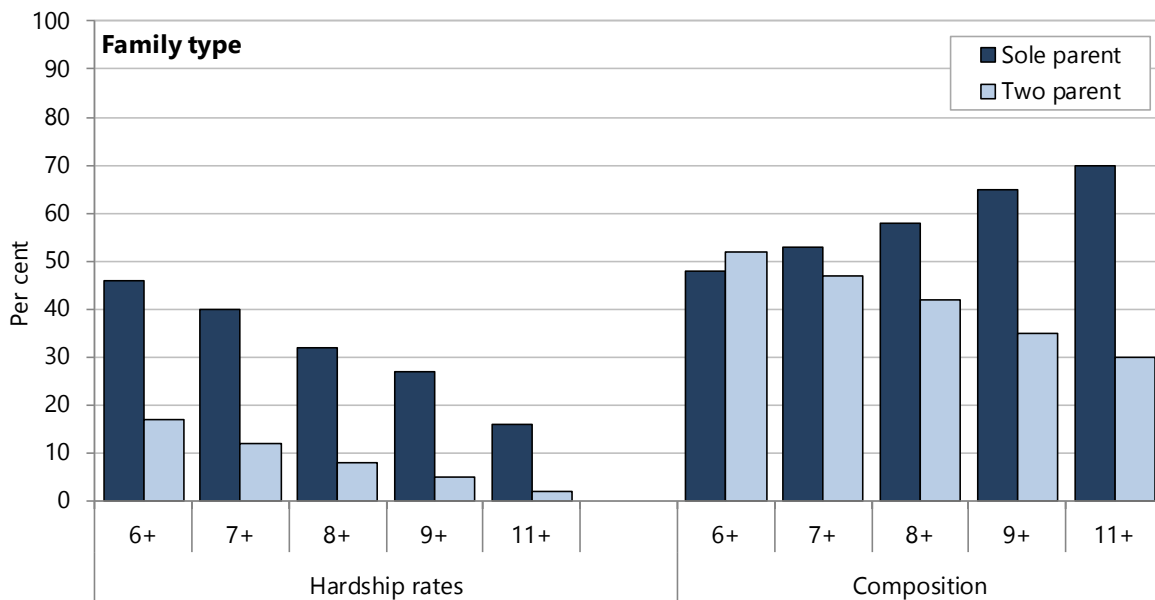


Source: NZ 2008 Living Standards Survey²⁵ from Perry, 2015³; Note: left side of graph ‘hardship rates’ answers “what percentage of the selected group of children are in hardship?” and right side of graph ‘composition’ answers “what percentage of all children in hardship are in this group?”

Family type

There was disparity between sole parent and two parent families in the percentage of children in hardship at all. At the 6+ threshold, 46% of children from sole parent families were in hardship compared to 17% of children from two parent families. At the severe hardship threshold (11+), 16% of children from sole parent families were in hardship compared to 2% of the children from two parent families. The composition of “all children in hardship” showed that at a 6+ threshold, 48% of children in hardship were from two parent families compared to 52% from sole parent families. This changed as severity increased and at the 11+ threshold 70% of all children living in hardship were from sole parent families compared to 30% from two parent families.

Figure 12. Children in hardship by family type

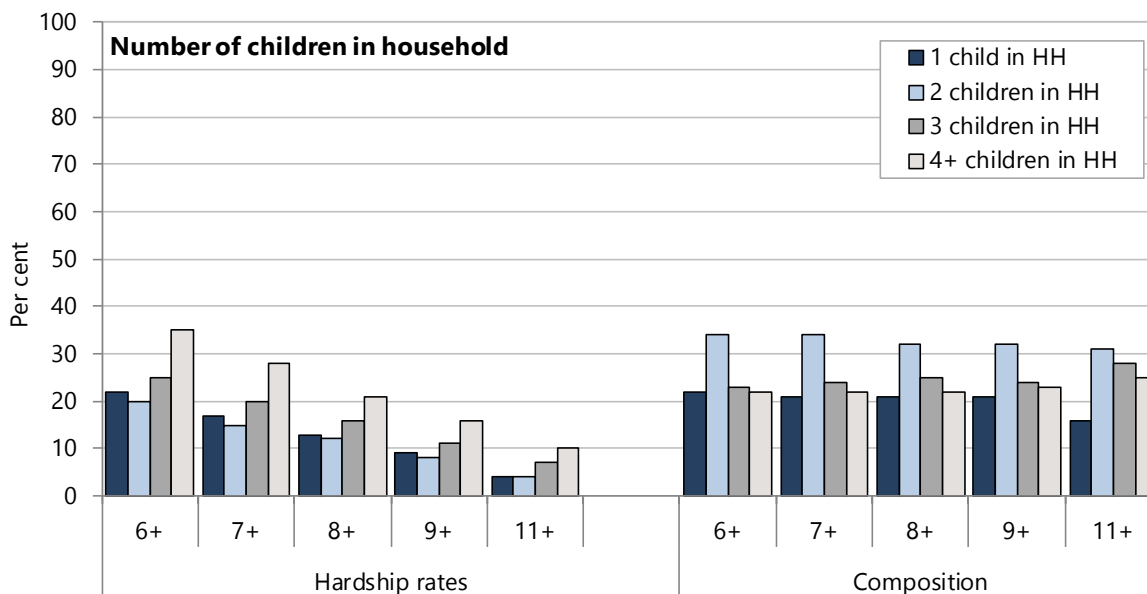


Source: NZ 2008 Living Standards Survey²⁵ from Perry, 2015³; Note: left side of graph ‘hardship rates’ answers “what percentage of the selected group of children are in hardship?” and right side of graph ‘composition’ answers “what percentage of all children in hardship are in this group?”

Number of children

A greater percentage of children in families with 4+ children were identified as being in hardship. At the 6+ threshold, 22% of children from one child households were in hardship compared to 35% of children in 4+ children households. The composition of “all children in hardship” was more evenly spread. Across the thresholds from 6+ and 9+, approximately a third of the children were from 2 children households while other sized families comprised between 20 to 25%. At the most severe hardship threshold (11+) the percentage of children from families with 3 or 4 + children increased and those from one child families reduced.

Figure 13. Children in hardship by children in household

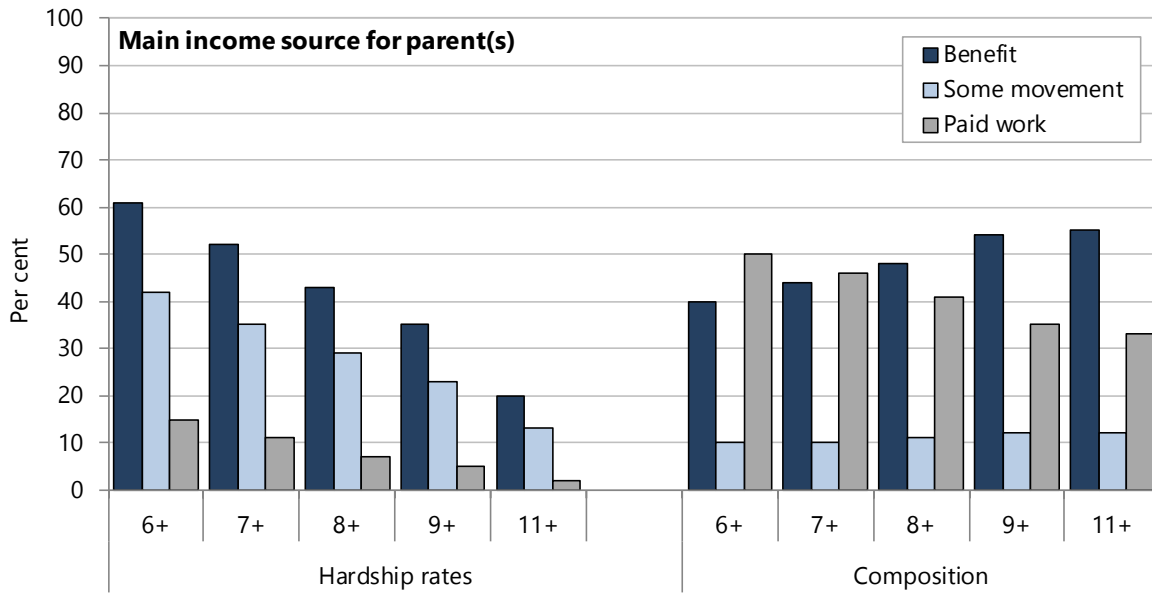


Source: NZ 2008 Living Standards Survey²⁵ from Perry, 2015³; Note: left side of graph ‘hardship rates’ answers “what percentage of the selected group of children are in hardship?” and right side of graph ‘composition’ answers “what percentage of all children in hardship are in this group?”

Source of income

The main source of income for the parent was determined as one of receiving a benefit, “some movement” indicating the adult moving between receiving a benefit and paid work (and vice versa), or paid work. At the 6+ hardship threshold, 61% of children from households where the main source of income was a benefit were in hardship compared to 15% of children with a parent in paid work. Those with parents moving between paid work and receiving a benefit comprised 42%. The composition of “all children in hardship” at the 6+ threshold of material was 50% in families with an adult in paid work and 40% receiving a benefit, and at the severe hardship threshold (11+) 55% were from families where the main source of income was a benefit and 33% were from families where the main income for the parent(s) was paid work.

Figure 14. Children in hardship by main income source for parent



Source: NZ 2008 Living Standards Survey²⁵ from Perry, 2015³; Note: left side of graph 'hardship rates' answers "what percentage of the selected group of children are in hardship?" and right side of graph 'composition' answers "what percentage of all children in hardship are in this group?"

Child poverty: severity and persistence

Severe poverty

Severe poverty measures lack the robustness of income poverty, however, their importance means proxy measures are utilised. One such measure of severity is a combination of being income poor AND being in material hardship. Severity of child poverty has also been shown in national and international studies by selecting an income threshold lower than the traditional 60% cut-off. The rationale is that where all else is the same, children in households with incomes below a 50% poverty threshold will experience greater material disadvantage than those just below a 60% threshold. Both of these measures are reported below.

Data source and methods

Definitions

1. Proportion of children aged 0–17 years who are both income poor (below 60% median after housing costs) and in material hardship ($MWI \leq 9 \approx DEP-17 7+$)
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 2015.² 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 NZHES Incomes Survey. The full NZHES (including expenditure data), however, remains 3-yearly. For more detail on methodology see Perry 2015.²

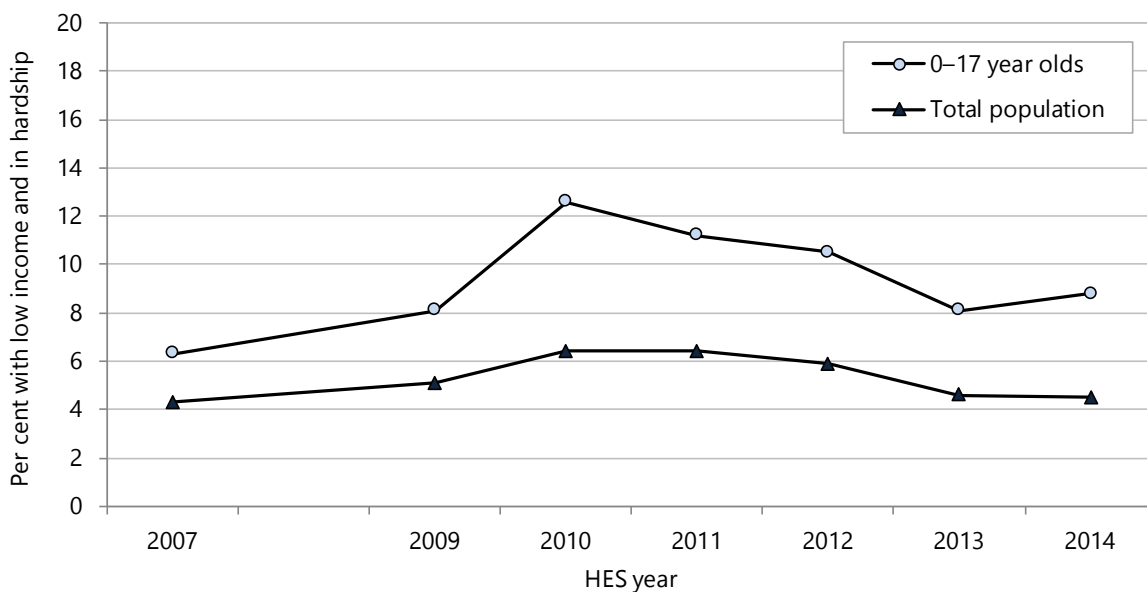
Interpretation

The <50% relative poverty measure is based on a poverty threshold (50% of the median income) that rises and falls with changes in national annual median incomes For further detail see Perry 2015.²

Income-poor and material hardship

The first measure identifies 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 <60% income threshold 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.² In 2014, 9% of households with children were income poor and in material hardship compared to less than 5% among the whole population (**Figure 15**).²

Figure 15. Trends in the percentage of those who are both income poor and materially deprived, New Zealand 2007–2014 NZHES years

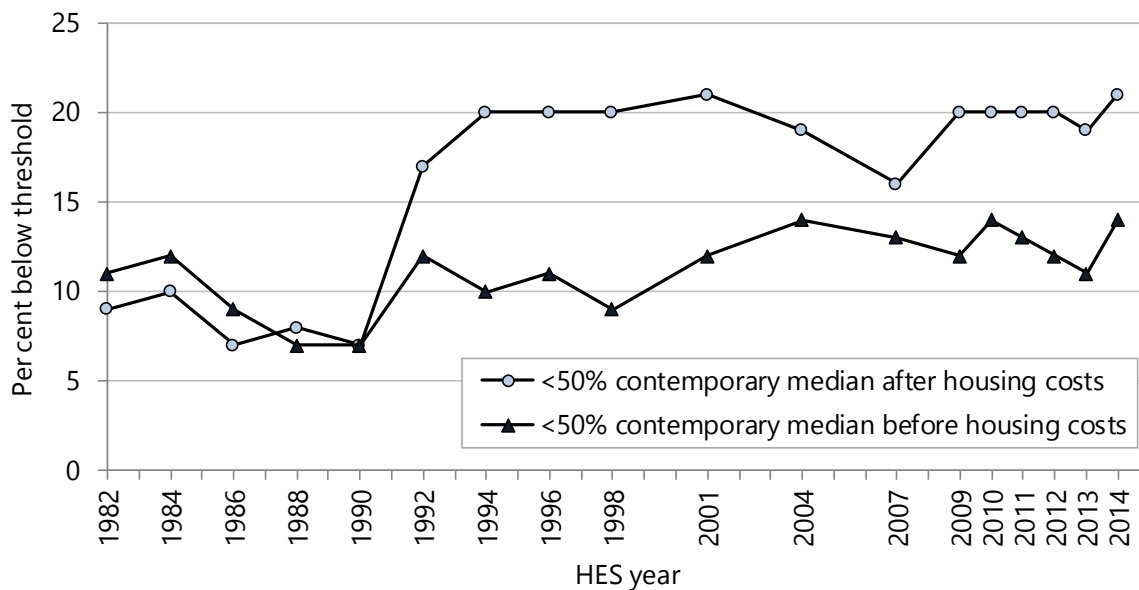


Source: Perry 2015² derived from Statistics NZ Household Economic Survey (HES) 2007–2014

Below 50% of contemporary median threshold

The ‘50%’ income poverty is another measure sometimes used to describe severe poverty. The percentage of children aged 0–17 years living in households with incomes below 50% of the contemporary median increased from 19% to 21% after accounting for housing costs (AHC) over the same time period (Figure 16).

Figure 16. Percentage of dependent children aged 0–17 years living below the 50% of median income poverty threshold, New Zealand 1982–2014 NZHES years



Source: Perry 2015² derived from Statistics NZ Household Economic Survey (HES) 1982–2014

Data source and methods

Definitions

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

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

The information in this section is drawn from Perry's 2015 Household Incomes Report,² which is based on the analysis of SoFIE data published by Carter and Imlach Gunasekara (2012)⁹ 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.²

Current Poverty: Participants were considered to be in current poverty if they fell below the income poverty line for the survey year under review.²

Note: In this analysis the poverty threshold used are based on 50% and 60% of gross median income. This is different to the threshold used in the earlier income poverty section which is based on 60% of disposable median income. Therefore, these two 60% thresholds are not comparable.² Where comparisons are required, the 50% gross is the most appropriate, as it is closer to the usual income poverty figures reported (that is, below 60% median disposable income).²

Persistent income poverty

Currently the set of data that provides a national measure on persistent poverty comes from Statistics New Zealand's Survey of Family, Income and Employment (SoFIE). SoFIE followed the same group of individuals from 2002–03 to 2008–09 to obtain longitudinal data over seven years.² While these estimates for poverty persistence have not been updated since 2012, they remain an important indicator for child poverty.

Data are described from two different age groups using two different thresholds of poverty. Poverty persistence was defined as being when a participant's average income over the seven years of the survey was below the average low income poverty line over the same period. (See Methods box for further details.)

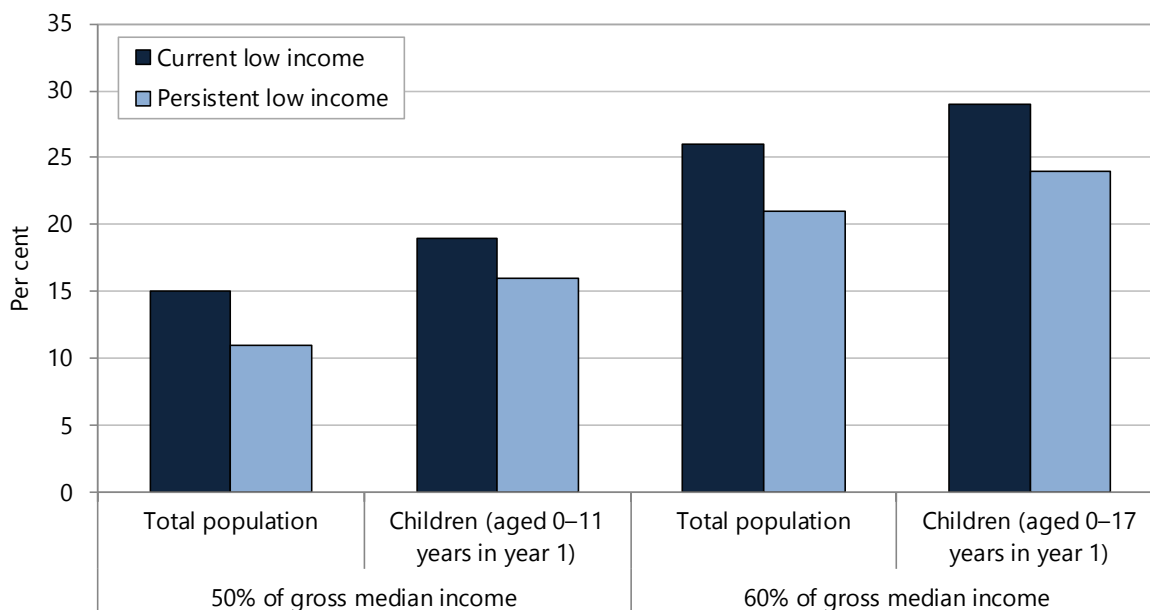
50% gross median threshold

When the threshold used was 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 over the seven years (Figure 17). In any one year, three out of five (60%) 0-11 year olds living in current poverty were also in persistent (also called chronic) poverty using the 50% gross median threshold.² 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.

60% gross median threshold

Of those aged 0–17 years in the first year of SoFIE (2002–03), 24% lived in households experiencing persistent poverty where the household income averaged across all seven years was below 60% of the gross median. Twenty-nine per cent were deemed to be in current poverty as their household income was below 60% of the gross median in the year under review (Figure 17). This difference reflected the mix of those in poverty comprising those who had transiently moved into poverty in any given year, and those who were living in long term poverty.²

Figure 17. Percentage of children with current and persistent low incomes, Statistics New Zealand's Survey of Family, Income and Employment (SoFIE) 2002–2009



Source: Perry 2014²⁴, derived from Statistics NZ's Survey of Family, Income and Employment 2002–2009

Child poverty related indicators

The following sections describe a suite of indicators that are related to child poverty. Some of these indicators reflect aspects of the context in which children are living such as household crowding and housing affordability. Others are measures of factors known to be the consequence of living in poor conditions, such as infant mortality, Sudden Unexpected Death in Infancy (SUDI) and medical conditions with a social gradient. Some indicators, such as the education measures, offer a measure of both context and effect.

Health and wellbeing

This section of the Child Poverty Monitor uses National Collections of health data to provide an overview of impacts of child poverty on the health status of New Zealand children. A strong relationship between child health and social and occupational status is well established²⁶ and social inequities are responsible for a high proportion of death and illness for children in both poor and rich countries.²⁷

A World Health Organization report on social determinants of health noted that “within countries there are dramatic differences in health that are closely linked with degrees of social disadvantage”.²⁸ Health effects of poverty arise because of complex interactions between social factors such as education and education, environmental factors such as exposure to poor quality housing or contaminated soil, and social patterning of health-related behaviour such as smoking and diet.²⁷

There are three subsections to this part of the report. The first reviews deaths of children in the first year of life, an indicator that strongly reflects the economic and social environments of a country. The most common cause of infant death, sudden unexpected death in infancy (SUDI), is examined in more detail. The second subsection reviews deaths and hospitalisations for medical conditions and injuries that are known to have a social gradient. Although child abuse and neglect occurs throughout society, rates are higher for children living in socioeconomic deprivation, and the final subsection reviews deaths and hospitalisations for injuries incurred as a result of assault, neglect or maltreatment.

Infant mortality

The infant mortality rate is defined as the death of a live born child before he or she reaches their first birthday, per 1,000 live births. Infant mortality reflects the effects of economic and social environments, including characteristics of health systems, on the health of mothers and newborns²⁹ Infant mortality rates in New Zealand are higher than the OECD average and New Zealand ranked 13th highest out of 43 countries in 2011.³⁰

This section uses information from the National Mortality Collection and the Birth Registration Dataset to review infant mortality in New Zealand since 1990. Instances of sudden unexpected death in infancy, (SUDI), form a subset of the total infant deaths, and are described in greater detail in the second part of this section.

Data source and methods

Indicator

1. Infant mortality
2. Sudden Unexpected Death in Infancy (SUDI)

Data source

Numerator: National Mortality Collection

Denominator: Birth Registration Dataset (live births only)

Definition

Infant mortality: Death of a live born infant prior to 365 days of life per 1,000 live births

Sudden Unexpected Death in Infancy (SUDI): Death of a live born infant before the first year of life is completed (<365 days of life) per 1,000 live births, where the cause of death is Sudden Infant Death Syndrome (SIDS), accidental suffocation or strangulation in bed, inhalation of gastric contents or food, or ill-defined or unspecified causes.

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”.⁸ 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.¹¹ 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”.

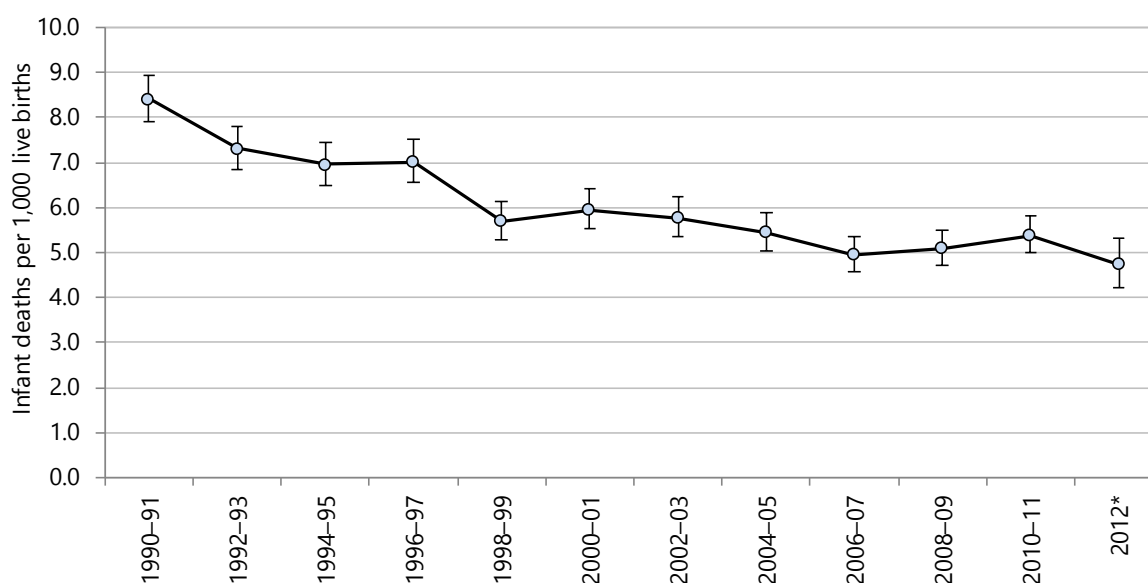
Note 2: In New Zealand, while SIDS rates have declined, there are still large ethnic differences and SIDS rates are six times higher for Māori infants than for European infants.¹⁵

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 appendices for an overview of the National Mortality Collection.

Patterns over time

The number of infant deaths in New Zealand declined from 507 in 1990 to 294 deaths in 2012. When considered in relation to the number of live births each year, there has been an overall fall in total infant mortality rate from 8.41 deaths per 1000 live births in 1990–1991 to 4.74 deaths per 1000 live births in 2012. Most of the fall in infant mortality rates occurred between 1990 and 1998, with a further slight fall to 2005, and there has been no significant difference in rates from year to year since 2005. The overall fall in infant mortality rates is mainly the result of a decline in deaths of infants aged from 28–364 days (**Figure 18**).

Figure 18. Infant mortality, New Zealand, 1990–2012

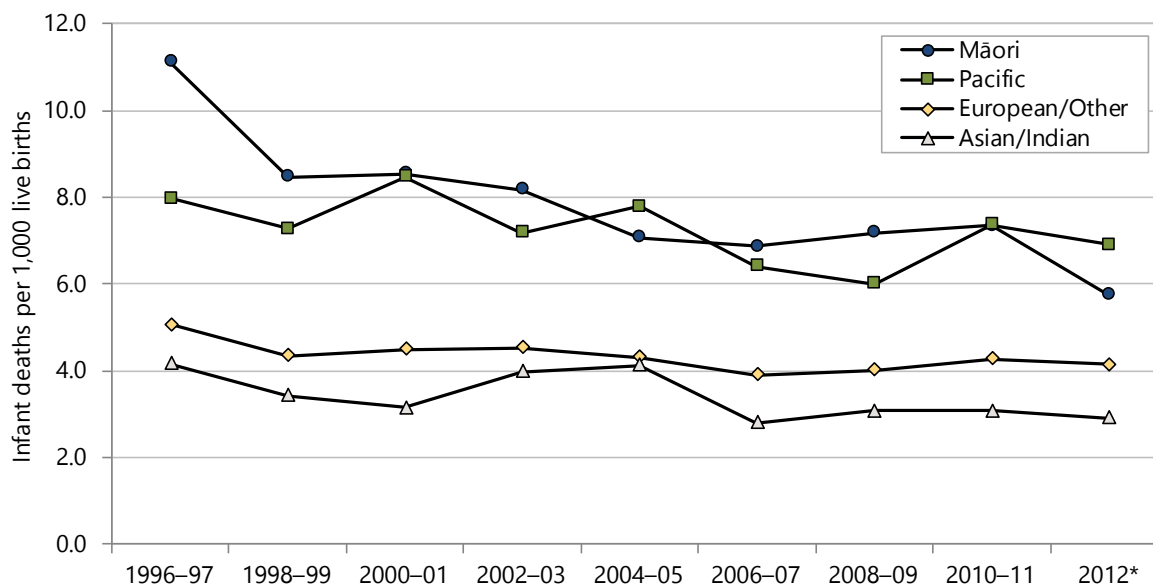


Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset. Note: 2012* is single year of data

Patterns by ethnicity

From 1996 to 2012 infant mortality rates fell for all ethnic groups in New Zealand. This was most noticeable for Māori and Pacific infants, for whom the rates are now closer to the lower rates observed for European, Asian, Indian and other infants (**Figure 19**).

Figure 19. Total infant, neonatal, and post neonatal mortality, New Zealand, by ethnicity, 1996–2012



Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset. Note: Ethnicity is level 1 prioritised, 2012* is single year of data

Maternal and infant factors

There are several infant and maternal factors associated with *statistically higher* rates of infant mortality. These include premature birth, living in areas with high scores on the NZDep2013 index of deprivation, Māori and Pacific ethnicity, male gender and young maternal age, as seen in **Table 4**. This univariate analysis does not quantify the independent effect of each factor; however it is probable that there are associations between these factors and poverty. Particular associations include:

- The mortality rate for infants born before 37 weeks gestation was 18 times higher than mortality rate for infants born at or after 37 weeks gestation
- The mortality rate for infants born in areas with the highest scores on the NZDep2013 index of deprivation (deciles 9–10) was almost three times higher than the mortality rate for infants born in areas with the lowest NZDep2013 scores (deciles 1–2)
- The mortality rates for Māori and Pacific infants were more than 1.6 times higher than mortality rates of European/Other infants, and mortality rates for Asian/Indian infants were lower than mortality rates for European/Other infants
- The mortality rate for male infants was 1.26 times higher than the mortality rate for female infants
- The mortality rates for infants born to mothers aged less than 20 years and aged 20–24 years were 2–3 times higher than the mortality rate for infants born to mothers aged 30–34 years; mortality rates for infants born to mothers aged 25–29

years and aged over 35 years were close to 1.25 times higher than the mortality rate for infants born to mothers aged 30–34 years.

Table 4. Infant mortality by demographic factor, New Zealand, 2008–2012

Variable	Rate	Rate ratio	95% CI	Variable	Rate	Rate ratio	95% CI
Infant mortality							
NZ Deprivation Index quintile				Prioritised ethnicity			
Deciles 1–2	2.77	1.00		Māori	6.96	1.68	1.51–1.87
Deciles 3–4	3.35	1.21	0.96–1.52	Pacific	6.72	1.62	1.40–1.88
Deciles 5–6	4.25	1.53	1.24–1.90	Asian/Indian	3.04	0.73	0.60–0.89
Deciles 7–8	5.00	1.80	1.47–2.21	European/Other	4.15	1.00	
Deciles 9–10	7.93	2.86	2.37–3.45	Gender			
Maternal age group				Female	4.54	1.00	
<20 years	10.18	2.88	2.43–3.42	Male	5.72	1.26	1.14–1.39
20–24 years	7.06	2.00	1.73–2.32	Gestation at birth			
25–29 years	4.44	1.26	1.08–1.47	20–36 weeks	37.94	18.08	16.34–20.02
30–34 years	3.53	1.00		37+ weeks	2.10	1.00	
35+ years	4.34	1.23	1.05–1.44				

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset. Note: Rates are per 1,000 live births; Rate ratios are unadjusted; Ethnicity is level 1 prioritised

Causes of infant deaths

Most infant deaths from 2008 to 2012 were caused by issues and conditions occurring in the time around birth, including congenital anomalies, extreme prematurity, intrauterine hypoxia or birth asphyxia, and other perinatal conditions. Over this period there were 464 deaths in total: an average of 92.8 per year. The second major cause of death in the first year of life was SUDI: 282 deaths in total, an average of 56.4 per year. There were 32 infant deaths from injury or poisoning, and 192 from other causes that each contributes fewer than 2% of deaths, in this five year period (**Table 5**).

Table 5. Infant mortality by main underlying cause of death, New Zealand, 2008–2012

Cause of death	Number: total 2008–2012	Number: annual average	Rate per 1,000 live births	Per cent of category
New Zealand				
Infant mortality				
Congenital anomalies	373	75	1.17	22.8
Extreme prematurity	264	53	0.83	16.2
Intrauterine hypoxia or birth asphyxia	26	5	0.08	1.6
Other perinatal conditions	464	93	1.46	28.4
SUDI: SIDS	140	28	0.44	8.6
SUDI: suffocation or strangulation in bed	125	25	0.39	7.7
SUDI: all other types	17	3	0.05	1.0
Injury or poisoning	32	6	0.10	2.0
Other causes	192	38	0.60	11.8
Total	1,633	327	5.14	100.0

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset. Note: SUDI = Sudden Unexpected Death in Infancy; SIDS = Sudden Infant Death Syndrome

Sudden unexpected death in infancy

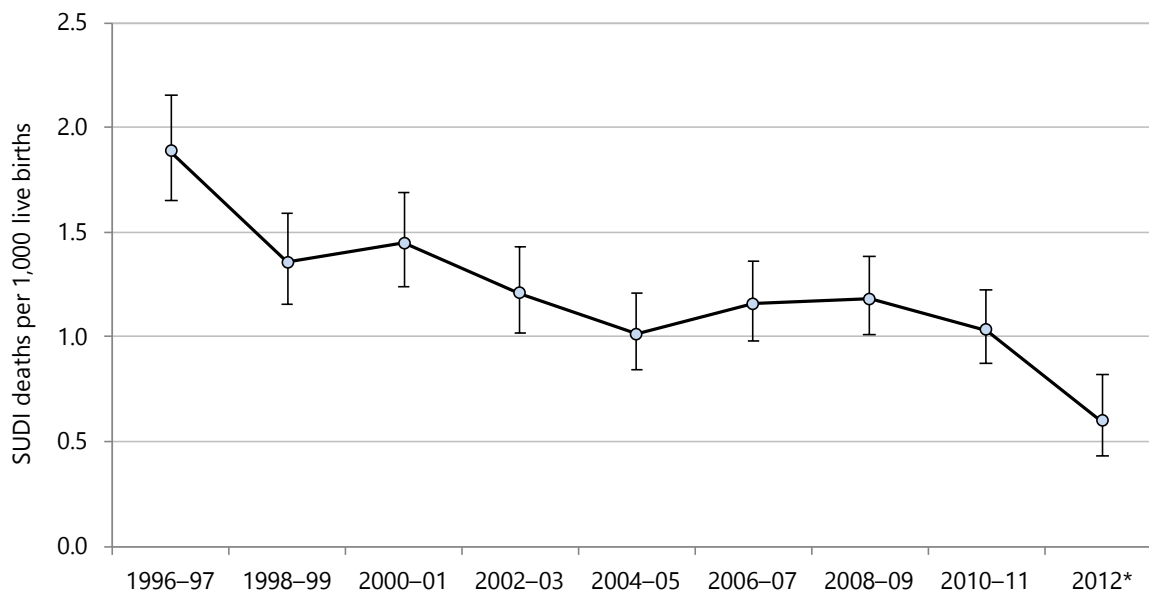
Sudden unexpected death in infancy (SUDI) is a term used to describe deaths in the first year of life that occur suddenly and unexpectedly, usually in otherwise healthy infants, and often during sleep.³¹ SUDI is the leading cause of death for New Zealand infants aged from 28–364 days.³²

Patterns over time and by ethnicity

The number of deaths of infants in the first year of life as a result of SUDI reduced from 217 in 1996–1997 to 131 in 2010–2011. There has been a statistically *significant* fall in the SUDI rate from 1.88 deaths per 1000 live births in 1996–1997 to 0.6 deaths per 1000 live births in 2012 (**Figure 20**).

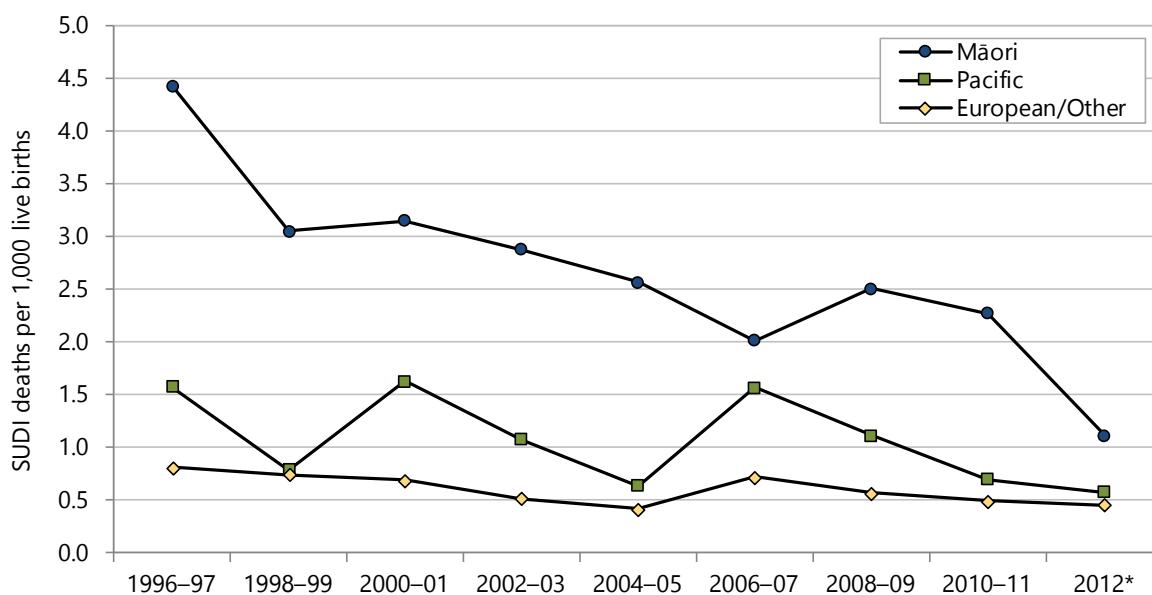
From 1996–97 to 2012 the SUDI rate fell for all ethnic groups in New Zealand. The decline in SUDI rates was most noticeable for Māori infants, and also for Pacific infants, and brought the SUDI rates for these infants closer to the lower rates observed for European/Other infants (**Figure 21**).

Figure 20. Sudden unexpected death in infancy, New Zealand, 1996–2012



Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset. Note: 2012* is single year of data; Error bars represent 95% confidence interval.

Figure 21. Sudden unexpected death in infancy (SUDI) by ethnicity, New Zealand, 1996–2012



Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset. Note: Ethnicity is level 1 prioritised; Asian/Indian rate suppressed due to small numerator numbers; 2012* is single year of data

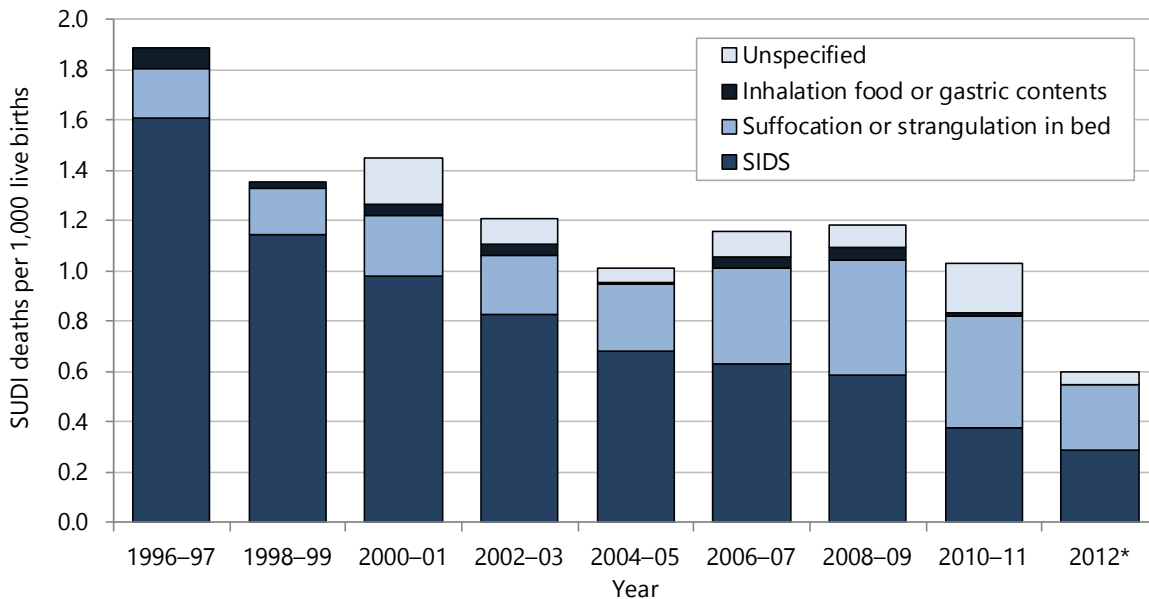
Causes of SUDI

The most common specific diagnoses within the SUDI group were sudden infant death syndrome (SIDS) and suffocation and strangulation in bed. Since 2000 use of the diagnostic codes for SIDS has decreased and use of codes for suffocation and strangulation in bed and unspecified SUDI has increased (**Figure 22**).

These types of SUDI were observed in all age groups from 0–47 weeks in the five years 2008–2012. SUDI deaths occurred predominantly in the first 15 weeks of life, with the

annual average number of deaths declining with increasing age and no SUDI deaths reported between 47 and 52 weeks of age.

Figure 22. Sudden unexpected death in infancy (SUDI) by cause, New Zealand, 1996–2012



Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset. Note: SUDI rates due to inhalation of food or gastric contents based on small numerator numbers; 2012* is single year of data

Distribution by demographic characteristic

Demographic factors associated with *statistically higher* rates of SUDI in New Zealand from 2008 to 2012 included living in an area with high scores in the NZDep2013 index of deprivation, Māori and Pacific ethnicity, premature birth, male gender and maternal age under 30 years (**Table 6**). In particular:

- The SUDI rate for infants born in areas with the highest scores on the NZDep2013 index of deprivation (deciles 9–10) was six times higher than infant mortality rates for infants in areas with the lowest NZDep2013 scores (deciles 1–2)
- The SUDI rate for Māori infants was four times higher than the SUDI rate for European/Other infants
- The SUDI rate for Pacific infants was 1.6 times higher than the SUDI rate for European/Other infants
- The SUDI rate for infants born before 37 weeks gestation was three times higher than the mortality rate for infants born at or after 37 weeks gestation
- The SUDI rate for male infants was 54% higher than the SUDI rate for female infants
- The SUDI rate for infants born to mothers aged younger than 30 years was higher than the SUDI rate for infants born to mothers aged 30 years and over. This

difference was most marked for infants born to mothers aged under 20 years (SUDI rate more than seven times the rate for infants born to mothers aged 30 years or older) and for infants born to mothers aged 20–25 years (SUDI rate more than four times the rate for infants born to mothers aged 30 years or older).

Table 6. Distribution of sudden unexpected death in infancy, by demographic factor, New Zealand, 2008–2012

Variable	Rate per 1,000 live births	Rate ratio	95% CI	Variable	Rate per 1,000 live births	Rate ratio	95% CI
Sudden Unexpected Death in Infancy (SUDI)							
NZ Deprivation Index decile				Prioritised ethnicity			
Deciles 1–2	0.31	1.00		Māori	2.14	4.13	3.18–5.35
Deciles 3–4	0.49	1.61	0.84–3.10	Pacific	0.84	1.62	1.06–2.46
Deciles 5–6	0.57	1.86	1.00–3.47	Asian/Indian	0.33	0.63	0.34–1.15
Deciles 7–8	1.11	3.63	2.05–6.41	European/Other	0.52	1.00	
Deciles 9–10	1.84	6.04	3.50–10.4	Gender			
Maternal age group				Female	0.79	1.00	
<20 years	2.75	7.36	4.82–11.24	Male	1.21	1.54	1.23–1.93
20–24 years	1.73	4.63	3.12–6.86	Gestation at birth			
25–29 years	0.71	1.90	1.24–2.93	20–36 weeks	2.24	3.17	2.35–4.29
30–34 years	0.37	1.00		37+ weeks	0.70	1.00	
35+ years	0.35	0.93	0.55–1.56				

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset. Note: Rates are per 1,000 live births; Rate ratios are unadjusted; Ethnicity is level 1 prioritised

Conditions with a social gradient

The New Zealand Child and Youth Epidemiology Service has identified a number of injury types and medical conditions seen in children for which hospitalisation or mortality rates are correlated to scores on the NZDep index of deprivation. These conditions are said to have a social gradient: children living in the most deprived areas of New Zealand (areas with high NZDep scores) are about twice as likely or more to be hospitalised or die from these conditions than children living in the least deprived areas (see Appendix 1).

This section uses information from the National Mortality Collection to review deaths from medical conditions and injuries with a social gradient in New Zealand from 2000–2012. This is followed by a review of hospitalisations for medical conditions and injuries with a social gradient in New Zealand from 2000 to 2014, using data held in the National Minimum Dataset.

Data sources and methods

Indicators

1. Deaths from medical conditions and injuries with a social gradient and sudden unexpected death in infancy (SUDI) in children aged 0–14 years
2. Hospitalisations for medical conditions and injuries with a social gradient in children aged 0–14 years

Data sources

Numerator:

1. National Mortality Collection (MORT)
2. National Minimum Dataset (NMDS)

Denominator: Statistics NZ estimated resident population

Medical conditions with a social gradient: Deaths and hospitalisations (neonates <28 days excluded) with the following primary diagnoses: Acute bronchiolitis; acute lower respiratory infection unspecified; acute upper respiratory infections; asthma and wheeze; bronchiectasis; croup/laryngitis/tracheitis/epiglottitis; dermatitis and eczema; epilepsy or status epilepticus; febrile convulsions; gastroenteritis; inguinal hernia; meningitis; meningococcal disease; nutritional deficiencies or anaemias; osteomyelitis; otitis media; pneumonia; rheumatic fever or rheumatic heart disease; skin infections; tuberculosis; urinary tract infection; vaccine preventable diseases; viral infection of unspecified site. Hospitalisations were identified in discharge data as acute and arranged (arranged = within 7 days of referral). Waiting-list cases were excluded.

Injury with a social gradient: Deaths and hospitalisations (neonates <28 days excluded) with a primary diagnosis of injury and the following primary external cause codes: falls; mechanical forces; poisoning; thermal injury; transport (pedestrian, cyclist, and vehicle occupant). In order to ensure comparability over time, all injury cases with an Emergency Department specialty code on discharge were excluded from hospitalisation data. See Appendix 7 for ICD-10 codes.

Post-neonatal sudden unexpected death in infancy (SUDI): Death of a live born infant (neonates <28 days excluded) before 365 days of life where the cause of death is sudden infant death syndrome (SIDS), accidental suffocation or strangulation in bed, inhalation of gastric contents or food, or ill-defined or unspecified causes.

Notes on Interpretation

Note 1. Conditions and injuries with a social gradient: For a definition see Appendix 1.

Note 2. Hospitalisations and deaths in neonates (<28 days) were excluded from this indicator as the underlying context of their respiratory infections and/or other medical conditions may differ from those arising in the community. To be consistent neonatal SUDI was also excluded.

Note 3. The time series for hospitalisations differs from that for deaths due to the differences in data available from the Ministry of Health. MORT undergoes a comprehensive process of validation and finalisation before data dissemination¹² and is therefore around two years behind data from the NMDS.

Note 4. SUDI rates are traditionally calculated per 1,000 live births. For this section the denominator used is 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.

Note 5. Only acute and arranged admissions were included for the medical condition hospitalisations. No filtering by admission type was used for injury hospitalisations. All injury cases with an Emergency Department specialty code (M05–M08) on discharge were excluded.

Note 6. Caution is necessary if comparing rates in this section with those presented in earlier editions of the Technical Report as ICD codings and how they are used can change. For example in 2013 asthma (J45–J46) was broadened to asthma and wheeze (J45–J46, R062), J22 (unspecified lower respiratory infections) was added due to likely overlap with the already included J18.9 (unspecified pneumonia), and two additional codes (W78: inhalation of gastric contents; W79: inhalation and ingestion of food causing obstruction of the respiratory tract) were added to the SUDI indicator to be consistent with reporting from the Child and Youth Mortality Review Committee.

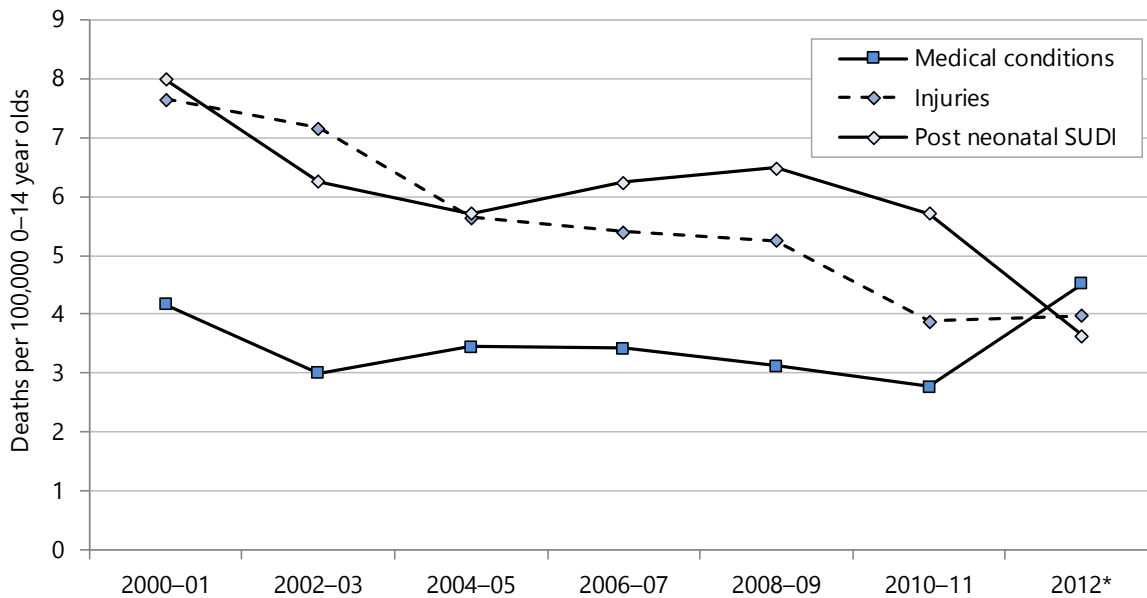
Note 7. When considering differences in the magnitude of social gradients between medical and injury hospitalisations note that these rates are not strictly comparable. For technical reasons, Emergency Department (ED) cases have been removed from injury hospitalisations. Social differences in attendance at the ED versus primary care for minor medical conditions may have accounted for some of the social gradients in medical hospitalisations.

Deaths from conditions with a social gradient

Patterns over time

The number of deaths from post-neonatal SUDI declined from 75 deaths in 2000 to 33 deaths in 2012, and the number of deaths of children 0-14 years old from injury with a social gradient declined from 68 deaths in 2000 to 36 deaths in 2012. Over the same time period the number of deaths of children aged 0-14 from medical conditions fluctuated around an average of 30.4 deaths year, with an apparent increase to 41 deaths in 2012 which may, however, be part of the year-to-year fluctuation. From 2000 to 2012 the rate for post-neonatal SUDI fell from 8.57 deaths to 3.64 deaths per 1,000,000 children, the mortality rate for injury with a social gradient fell from 7.77 deaths to 3.97 deaths per 100,000 children and the mortality rate for medical conditions with a social gradient has shown little overall change (**Figure 23**).

Figure 23. Deaths from conditions with a social gradient in 0–14 year olds, New Zealand, 2000–2012



Source: Numerator: National Mortality Collection (neonates removed); Denominator: Statistics NZ Estimated Resident Population. Note: 2012* is single year of data

Causes of death from conditions with a social gradient

From 2008 to 2012 there was an average of 29 deaths per year from medical conditions with a social gradient (a rate of 3.27 deaths per 100,000 children aged 0-14 years). The most common underlying causes of death in this category were communicable diseases such as pneumonia, meningococcal disease and gastroenteritis, and chronic diseases such as epilepsy and asthma (**Table 7**).

There was an average of 40 deaths per year from injuries with a social gradient (a rate of 4.44 deaths per 100,000 children). Transport-related injuries as a vehicle occupant, pedestrian or cyclist accounted for over half (56%) of these deaths. Other causes of death

from injury in decreasing order of incidence were drowning, inanimate and animate mechanical forces (for example contact with machinery, or being struck by a person or bitten by an animal), thermal injury, poisoning and falls (**Table 7**).

Post-neonatal sudden unexpected death in infancy (SUDI) was the most frequent underlying cause of death from conditions with a social gradient from 2008 to 2012, accounting for an average of 50 deaths per year (a rate of 5.6 deaths per 100,000 children aged 0–14 years) and 42% of all deaths from conditions with a social gradient.

Table 7. Deaths from conditions with a social gradient in 0–14 year olds, by main underlying cause of death, New Zealand, 2008–2012

Cause of death	Number: total 2008–2012	Number: annual average	Rate per 100,000 0–14 year olds	Per cent of category
Medical conditions				
Pneumonia	56	11	1.24	38.1
Meningococcal disease	22	4	0.49	15.0
Epilepsy or status epilepticus	22	4	0.49	15.0
Gastroenteritis	11	2	0.24	7.5
Asthma and wheeze	10	2	0.22	6.8
Meningitis	5	1	0.11	3.4
Acute bronchiolitis	4	1	0.09	2.7
Bronchiectasis	3	1	0.07	2.0
Other conditions	14	3	0.31	9.5
Total medical conditions	147	29	3.27	100.0
Injuries				
Transport: vehicle occupant	68	14	1.51	34.0
Transport: pedestrian	36	7	0.80	18.0
Transport: cyclist	8	2	0.18	4.0
Drowning or submersion	46	9	1.02	23.0
Mechanical forces: inanimate and animate	16	3	0.36	8.0
Thermal injury	11	2	0.24	5.5
Poisoning	9	2	0.20	4.5
Falls	6	1	0.13	3.0
Total injuries	200	40	4.44	100.0
Post neonatal SUDI				
Post neonatal SUDI	252	50	5.60	
Total mortality New Zealand	599	120	13.31	

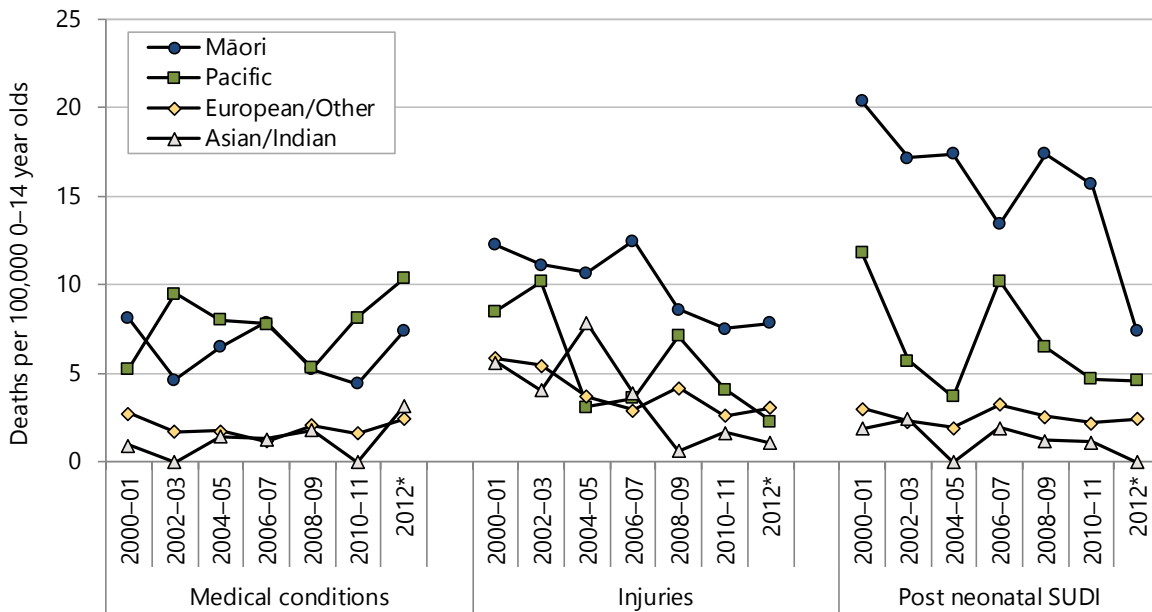
Source: Numerator: National Mortality Collection (neonates removed); Denominator: Statistics NZ Estimated Resident Population. Note: SUDI deaths are for infants aged 28–364 days only

Patterns by sociodemographic factors

There was ethnic disparity in mortality rates from medical conditions and injuries with a social gradient and also for post-neonatal SUDI.

Mortality rates for medical conditions with a social gradient fluctuated with little overall change between 2000 and 2012 for Māori, Asian/Indian and European/Other children, around averages of 6.3, 7.8 and 1.2 deaths per 100,000 children aged 0–14 years respectively. Mortality rates for medical conditions with a social gradient for Pacific children aged 0–14 years rose from 5.2 deaths to 10.3 deaths per 100,000 children between 2000 and 2012 (**Figure 24**).

Figure 24. Deaths from conditions with a social gradient in 0–14 year olds, by ethnicity, New Zealand, 2000–2012



Source: Numerator: National Mortality Collection (neonates removed); Denominator: Statistics NZ Estimated Resident Population; SUDI deaths are for infants aged 28–364 days only; Ethnicity is level 1 prioritised; 2012* is single year of data

In the five years from 2008–2012 the mortality rates from medical conditions with a social gradient were *significantly* higher for Māori and Pacific children compared with other New Zealand children aged 0–14 years. The mortality rate for injuries with a social gradient was *significantly* higher for Māori children compared with other New Zealand children (**Table 8**).

The fall in mortality rates from injuries with a social gradient for children aged 0–14 years occurred across all ethnic groups from 2000 to 2012, from 12.3 to 7.8 deaths per 100,000 Māori children, 8.5 to 2.3 deaths per 100,000 Pacific children, 5.6 to 3.1 deaths per 100,000 Asian/Indian children and 5.8 to 3.0 deaths per 100,000 European/Other children. In 2012 the mortality rates from injuries with a social gradient for Pacific children aged 0–14 years was lower than the rate for European/Other children (**Figure 24**).

The fall in post-neonatal SUDI rates from 2000–2012 was most marked for Māori infants (from 20.4 to 7.4 deaths per 100,000 children aged 0–14 years) and Pacific infants (from 11.8 to 4.6 deaths per 100,000 children aged 0–14 years). In 2012 post-neonatal SUDI rates for Māori and Pacific infants were closer to the rate for European/Other infants (2.4 deaths per 100,000 children aged 0–14 years) compared with 2000–2001 rates. The small absolute

number of Asian/Indian children in the SUDI dataset means that changes over time for these ethnic groups cannot be interpreted in a meaningful way (**Figure 24**).

Analysis of aggregate data from 2008 to 2012 by score on the NZDep2013 index of deprivation confirmed a social gradient in mortality rates for the selected medical conditions and injuries (**Table 8**).

In this time period mortality rates from injury with a social gradient were *significantly* higher for male children compared with female children aged 0–14 years (**Table 8**).

Table 8. Distribution of mortality with a social gradient in children aged 0–14 years, by demographic factors, New Zealand 2008–2012

Variable	Rate	Rate ratio	95% CI	Variable	Rate	Rate ratio	95% CI
Death from conditions with a social gradient in 0–14 year olds							
Medical conditions							
NZ Deprivation Index quintile				Prioritised ethnicity			
Deciles 1–2	1.05	1.00		Māori	5.32	2.72	1.86–3.96
Deciles 3–4	2.38	2.26	1.02–4.99	Pacific	7.47	3.81	2.44–5.95
Deciles 5–6	2.12	2.01	0.90–4.47	Asian/Indian	1.35	0.69	0.29–1.60
Deciles 7–8	3.32	3.15	1.50–6.62	European/Other	1.96	1.00	
Deciles 9–10	6.48	6.15	3.07–12.3	Gender			
				Female	2.87	1.00	
				Male	3.64	1.27	0.91–1.76
Injuries							
NZ Deprivation Index quintile				Prioritised ethnicity			
Deciles 1–2	1.76	1.00		Māori	7.99	2.40	1.78–3.24
Deciles 3–4	2.88	1.64	0.86–3.14	Pacific	4.90	1.48	0.91–2.38
Deciles 5–6	3.88	2.21	1.20–4.07	Asian/Indian	1.12	0.34	0.14–0.83
Deciles 7–8	3.75	2.13	1.17–3.91	European/Other	3.32	1.00	
Deciles 9–10	8.65	4.92	2.85–8.49	Gender			
				Female	3.15	1.00	
				Male	5.68	1.81	1.35–2.42

Source: Numerator: National Mortality Collection (neonates removed); Denominator: Statistics NZ Estimated Resident Population; Rates are per 100,000 0–14 year olds; Rate ratios are unadjusted; Ethnicity is level 1 prioritised

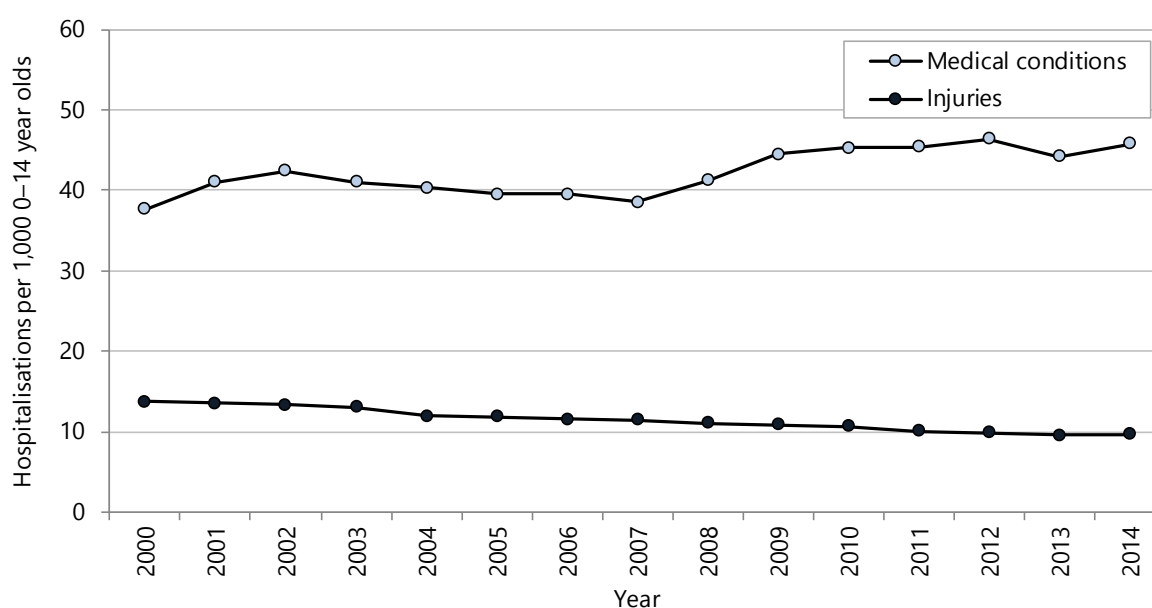
Hospitalisation for conditions with a social gradient

Patterns over time

In the five years 2010–2014 there were 205,661 hospitalisations of children aged 0–14 years for medical conditions with a social gradient: an overall rate of 45.41 per 1,000 children. From 2000 to 2014 the number of hospitalisations for medical conditions with a social gradient increased from 32,907 (a rate of 37.61 per 1,000 children) to 41,729 (45.77 per 1,000 children). The increase was most apparent from 2007–2012 (**Figure 25**).

In the same time period there were 45,160 hospitalisations for injuries with a social gradient (a rate of 9.97 per 1,000 children). The number of hospitalisations for injuries with a social gradient decreased from 12,026 (13.74 per 1,000 children) in 2000 to 8,808 (9.66 per 1,000 children) in 2014 (**Figure 25**).

Figure 25. Hospitalisations for conditions with a social gradient in 0–14 year olds (excluding neonates), New Zealand 2000–2014



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated population. Note: Medical conditions include acute and arranged hospitalisations; Injuries excludes ED cases

Reasons for admission in children aged 0–14 years, 2010–2014

The most common primary diagnoses for medical conditions with a social gradient were respiratory illnesses (for example: asthma and wheeze, acute respiratory infections, acute bronchiolitis and pneumonia), gastroenteritis, other viral infections and skin infections. Almost half (49.8%) of injury hospitalisations with a social gradient resulted from falls. Other common types of injury were those caused by inanimate and animate mechanical forces, and transport-related injuries as a cyclist, vehicle occupant or pedestrian (**Table 9**).

Table 9. Hospitalisations for conditions with a social gradient in 0–14 year olds (excluding neonates) by primary diagnosis, New Zealand 2010–2014

Primary diagnosis	New Zealand			
	Number: total 2010–2014	Number: annual average	Hospitalisation rate per 1,000	Per cent of category
Medical conditions				
Asthma and wheeze	31,684	6,336.8	7.00	15.4
Acute respiratory infections*	29,519	5,903.8	6.52	14.4
Acute bronchiolitis	28,990	5,798.0	6.40	14.1
Gastroenteritis	27,621	5,524.2	6.10	13.4
Viral infection of unspecified site	21,522	4,304.4	4.75	10.5
Skin infections	16,022	3,204.4	3.54	7.8
Pneumonia: bacterial, non-viral	12,864	2,572.8	2.84	6.3
Urinary tract infection	7,442	1,488.4	1.64	3.6
Croup, laryngitis, tracheitis, epiglottitis	6,637	1,327.4	1.47	3.2
Epilepsy or status epilepticus	4,600	920.0	1.02	2.2
Dermatitis and eczema	3,699	739.8	0.82	1.8
Febrile convulsions	3,034	606.8	0.67	1.5
Otitis media	2,930	586.0	0.65	1.4
Pneumonia: viral	2,334	466.8	0.52	1.1
Osteomyelitis	1,217	243.4	0.27	0.6
Inguinal hernia	1,179	235.8	0.26	0.6
Rheumatic fever or rheumatic heart disease	1,009	201.8	0.22	0.5
Meningitis	981	196.2	0.22	0.5
Vaccine preventable diseases	934	186.8	0.21	0.5
Bronchiectasis	763	152.6	0.17	0.4
Nutritional deficiencies or anaemias	367	73.4	0.08	0.2
Meningococcal disease	265	53.0	0.06	0.1
Tuberculosis	48	9.6	0.01	0.0
Total	205,661	41,132.2	45.41	100.0
Injuries				
Falls	22,470	4,494.0	4.96	49.8
Mechanical forces: inanimate	12,194	2,438.8	2.69	27.0
Mechanical forces: animate	3,025	605.0	0.67	6.7
Transport: cyclist	1,984	396.8	0.44	4.4
Transport: vehicle occupant	773	154.6	0.17	1.7
Transport: pedestrian	766	153.2	0.17	1.7
Thermal injury	1,980	396.0	0.44	4.4
Poisoning	1,797	359.4	0.40	4.0
Drowning or submersion	171	34.2	0.04	0.4
Total	45,160	9,032.0	9.97	100.0

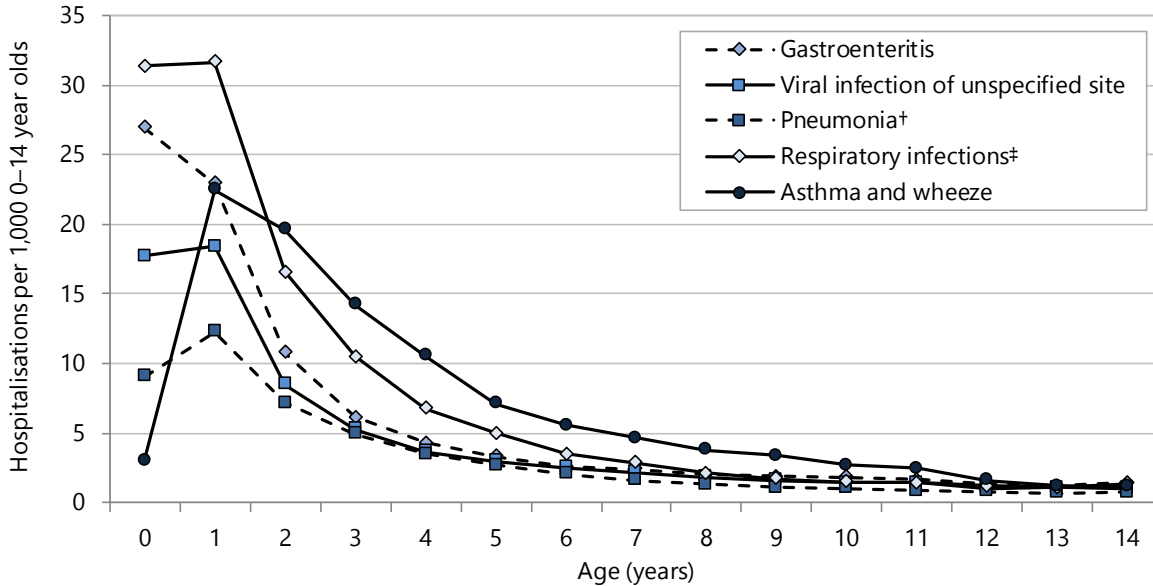
Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated population. Note: *Upper and lower respiratory infections excluding croup;

Patterns by sociodemographic factors

Hospitalisation rates for selected conditions with a social gradient were highest for children aged 1 year and then fell sharply with increasing age over the period 2010–2014 (**Figure 26**).

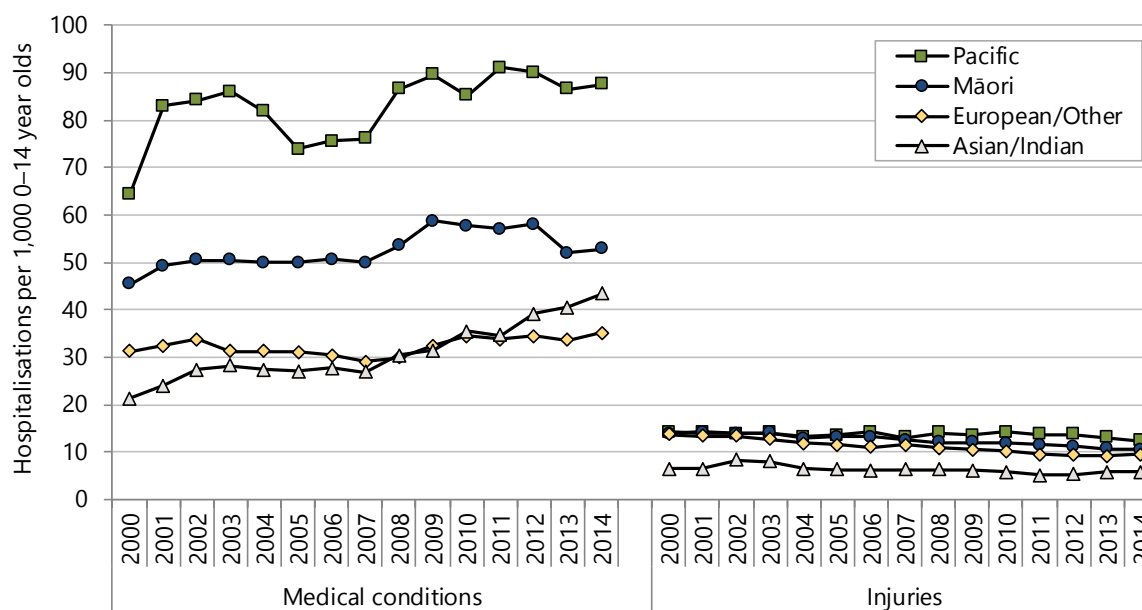
There was ethnic disparity in hospitalisation rates for medical conditions and injuries with a social gradient. Although hospitalisation rates for medical conditions with a social gradient increased for children aged 0–14 years in all ethnic groups from 2000 to 2014, this increase was less marked for European/Other children compared with Māori, Pacific and Asian/Indian children. The decrease in hospitalisation rates for injuries with a social gradient was also observed for children in all ethnic groups, but was most marked for European/Other children compared with Māori, Pacific and Asian/Indian children (**Figure 27**).

Figure 26. Hospitalisations for select conditions with a social gradient in 0–14 year olds, by age, New Zealand 2010–2014



Source: Numerator: National Minimum Dataset (neonates removed); Denominator: Statistics NZ Estimated Resident Population. Note: Acute and arranged admissions only; † includes bacteria, non-viral, and viral pneumonia; ‡ includes acute upper and lower respiratory infections (including croup, laryngitis, tracheitis and epiglottitis)

Figure 27. Hospitalisations for conditions with a social gradient in 0–14 year olds (excluding neonates) by ethnicity, New Zealand 2000–2014



Source: Numerator: National Minimum Dataset (neonates removed); Denominator: Statistics NZ Estimated Resident Population. Note: Medical conditions: acute and arranged admissions only; Injury: excludes emergency department cases and waiting list admissions; Ethnicity is level 1 prioritised

In the five years from 2010–2014 hospitalisation rates for medical conditions with a social gradient were *significantly* higher for male children compared with female children aged 0–14 years (**Table 10**).

In this time period hospitalisation rates for medical conditions and for injury with a social gradient were *significantly* higher for Māori, Pacific and Asian/Indian children aged 0–14 years than for European/Other children. This difference was most marked for Pacific children where the hospitalisation rate was 2.5 times higher than for European/Other children. Hospitalisation rates for injuries with a social gradient were *significantly* higher for Māori and Pacific children and *significantly* lower for Asian/Indian children compared with European/Other children (**Table 10**).

Analysis of aggregate data from 2010 to 2014 by score on the NZDep2013 index of deprivation confirmed a social gradient in hospitalisation rates for the selected medical conditions and injuries (**Table 10**).

Table 10. Distribution of hospitalisations for conditions with a social gradient in 0–14 year olds (excluding neonates) by sociodemographic factors New Zealand 2010–2014

Variable	Rate	Rate ratio	95% CI	Variable	Rate	Rate ratio	95% CI
Hospitalisations for conditions with a social gradient in 0–14 year olds							
Medical conditions							
NZ Deprivation Index quintile				Prioritised ethnicity			
Deciles 1–2	26.3	1.00		Māori	55.5	1.62	1.60–1.64
Deciles 3–4	32.0	1.21	1.19–1.24	Pacific	88.1	2.57	2.54–2.60
Deciles 5–6	36.9	1.40	1.38–1.42	Asian/Indian	38.8	1.13	1.11–1.15
Deciles 7–8	47.7	1.81	1.78–1.84	European/Other	34.3	1.00	
Deciles 9–10	75.3	2.86	2.82–2.90	Gender			
				Female	40.8	1.00	
				Male	49.8	1.22	1.21–1.23
Injuries							
NZDep2013 index of deprivation quintile				Prioritised ethnicity			
Deciles 1–2	7.48	1.00		Māori	10.9	1.17	1.15–1.20
Deciles 3–4	7.89	1.05	1.02–1.09	Pacific	13.0	1.40	1.36–1.44
Deciles 5–6	8.24	1.10	1.07–1.14	Asian/Indian	5.41	0.58	0.56–0.61
Deciles 7–8	9.40	1.26	1.22–1.30	European/Other	9.31	1.00	
Deciles 9–10	14.0	1.88	1.82–1.93	Gender			
				Female	7.91	1.00	
				Male	11.4	1.44	1.41–1.47

Sources: Numerator: National Minimum Dataset (neonates removed); Denominator: Statistics NZ Estimated Resident Population. Note: Medical conditions: acute and arranged admissions only; Injury: excludes emergency department cases and waiting list admissions; Rates are per 1,000 0–14 year olds; Rate ratios are unadjusted; Ethnicity is level 1 prioritised

Assault, neglect or maltreatment

Protection from all forms of violence is a fundamental right recognised in the United Nations Convention on the Rights of the Child³³ and yet maltreatment of children by parents or other caregivers is a common and serious public health issue in high-income countries like New Zealand, which has significant long-term negative consequences for the child throughout life, the family, and the society around them.¹⁰ Factors that have been identified as increasing the likelihood of assault, neglect or maltreatment include poverty, sole parenthood, the presence of a non-biological parent figure in the household, mental health problems, domestic violence, and alcohol and drug misuse.^{34, 35} This section uses information from the National Mortality Collection to review deaths of children aged 0–14 years that were the result of assault, neglect, or maltreatment from 2000 to 2012, with more detailed analysis from 2008 to 2012.

Data sources and methods

Indicator

1. Deaths from injuries arising from the assault, neglect, or maltreatment of 0–14 year olds
2. Hospitalisations for injuries arising from the assault, neglect, or maltreatment of 0–14 year olds

Data sources

Numerator:

1. National Mortality Collection
2. National Minimum Dataset

Denominator: Statistics New Zealand estimated resident population

Definitions

Assault: injuries inflicted by another person with intent to injure or kill, by any means

Maltreatment syndromes include physical abuse, sexual abuse, psychological abuse and other maltreatment syndromes. Specific definitions from Gilbert *et al.* 2009.¹⁰

Physical abuse: Intentional use of physical force or implements that results in, or has the potential to result in, physical injury; Sexual abuse: Any completed or attempted sexual act, sexual contact, or non-contact sexual interaction with a child by a caregiver (includes substitute caregivers in a temporary custodial role for example teachers, coaches, clergy and relatives); Psychological abuse: Intentional behaviour that conveys to a child that he/she is worthless, flawed, unloved, unwanted, endangered, or valued only in meeting another's needs; Neglect: Failure to meet a child's basic physical, emotional, medical/dental, or emotional needs, failure to provide adequate nutrition, hygiene, or shelter; or failure to ensure a child's safety; Maltreatment: Any act of commission or omission by parent or other caregiver that results in harm, potential for harm, or threat of harm to a child whether or not harm is intended.

Notes on interpretation

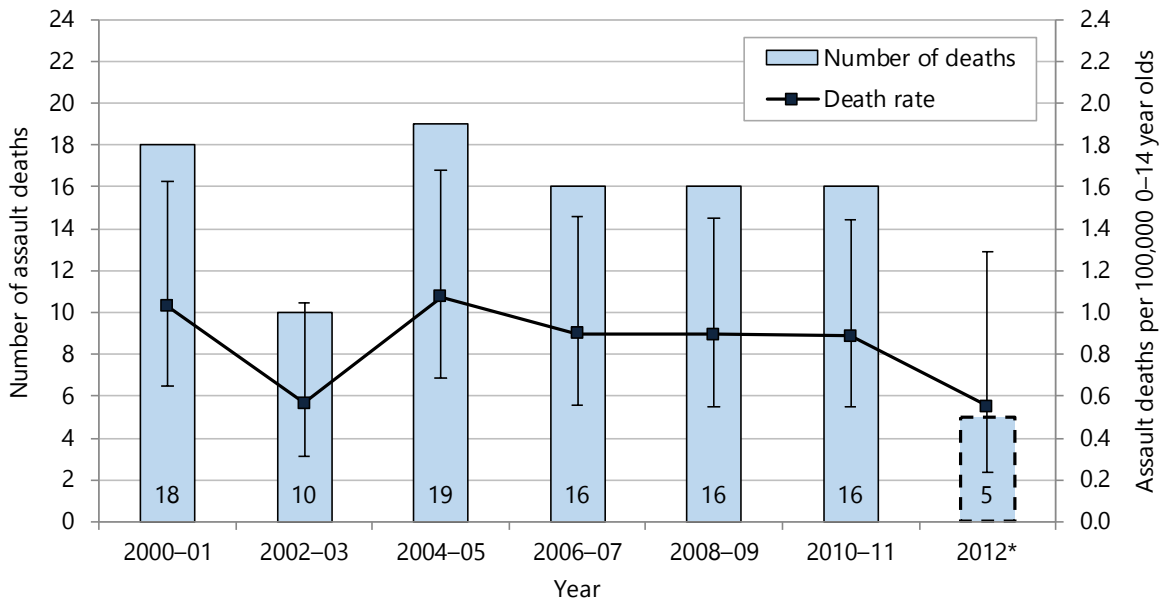
In order to ensure comparability over time, all cases with an emergency department specialty code on discharge were excluded, as were hospitalisations with a primary diagnosis outside of the injury range. Limitations of the National Minimum Dataset are outlined in Appendix 3. Readers are advised to review Appendix 3 before interpreting any trends based on hospitalisation data. See Appendix 7 for coding details.

Deaths from assault, neglect or maltreatment

Patterns over time

From 2000 to 2012 there were 100 deaths of children aged 0–14 years from injuries arising from assault, neglect, or maltreatment. The rate has remained stable at around 0.9 deaths per 100,000 children, with lower rates in 2002–03 and in 2012 (**Figure 28**).

Figure 28. Deaths due to injuries arising from the assault, neglect, or maltreatment of 0–14



Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset. Note: Error bars represent 95% confidence interval; 2012* is single year of data

Patterns by sociodemographic and other factors

In the five years from 2008–2012 the deaths of 37 children were the result of assault, neglect or maltreatment. There were 21 deaths of female children, and 16 of male children. In that time period 13 deaths occurred in the first year of life, 18 deaths from age 1–4 years, three from age 5–9 years and three from age 10–14 years. The forms of fatal assault included strangulation or suffocation; assault by blunt object, bodily force, sharp object or fire and flame; drowning; neglect and abandonment; and other maltreatment. The most common category, accounting for 13 of the 37 cases, was other maltreatment. The relationship of the perpetrator to the deceased was recorded in only 13 cases and was a parent in 9 of those cases.

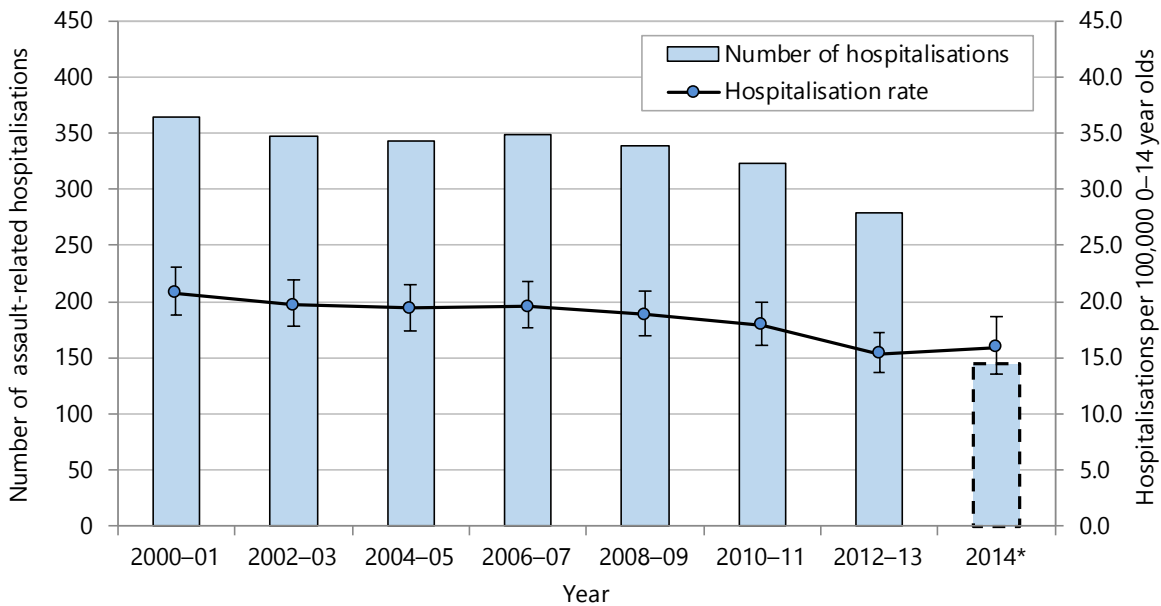
Hospitalisations due to assault, neglect or maltreatment

The following section uses information from the National Minimum Dataset to review hospitalisations of children aged 0–14 years for injuries arising from assault, neglect or maltreatment from 2000 to 2014, with more detailed analysis from 2010 to 2014.

Patterns over time

The number of hospitalisations of New Zealand children aged 0–14 years for injuries arising from assault, neglect or maltreatment reduced from 168 in 2000 to 145 in 2014. When analysed in two-year aggregated periods and in relation to the population of children aged under 15 years, this represents a small but *significant* fall in the hospitalisation rate from 20.8 hospitalisations per 100,000 children in 2000–2001 to 15.9 hospitalisations per 100,000 children in 2014 (**Figure 29**).

Figure 29. Hospitalisations due to injuries arising from the assault, neglect, or maltreatment of 0–14 year olds, New Zealand, 2000–2014



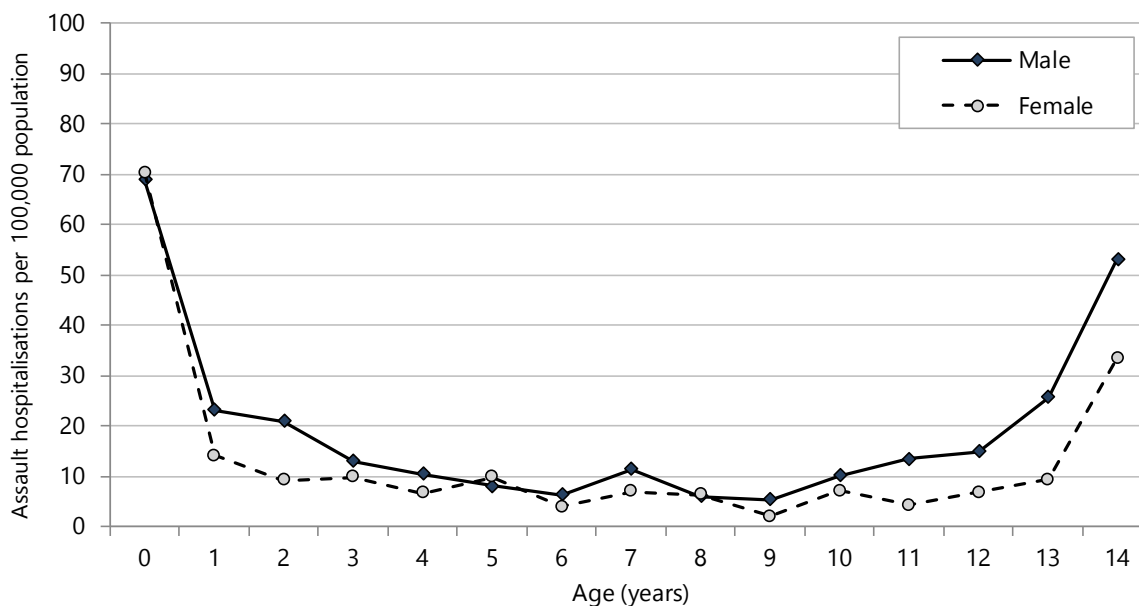
Source: Numerator: National Minimum Dataset (emergency department cases excluded); Denominator: Statistics NZ Estimated Resident Population; Numbers of hospitalisations are per two year period, with the exception of 2014

Distribution by demographic characteristics

In the five years 2010–2014 age-specific hospitalisation rates for injuries arising from assault, neglect or maltreatment were highest in the first year of life (68.9–70.3 hospitalisations per 100,000 children aged less than one year) (**Figure 30**).

From 2010 to 2014 hospitalisation rates were *significantly* higher for male children compared with female children, *significantly* higher for Māori and Pacific children compared with European/Other children and *significantly* lower for Asian/Indian children compared with European/Other children. There was a clear social gradient with the hospitalisation rate for children living in areas with the highest scores on the NZDep2013 index of deprivation eight times higher than the rate for children living in areas with the lowest NZDep2013 scores (**Table 11**).

Figure 30. Hospitalisations due to injuries arising from the assault, neglect, or maltreatment of 0–14 year olds, by age and gender, New Zealand 2010–2014



Source: Numerator: National Minimum Dataset (emergency department cases excluded); Denominator: Statistics NZ Estimated Resident Population

Table 11. Hospitalisations for injuries arising from the assault, neglect, or maltreatment of 0–14 year olds, by demographic factors, New Zealand 2010–2014

Variable	Rate	Rate ratio	95% CI	Variable	Rate	Rate ratio	95% CI
Assault, neglect, or maltreatment hospitalisations of 0–14 year olds							
New Zealand							
NZDep2013 index of deprivation quintile				Prioritised ethnicity			
Deciles 1–2	3.67	1.00		Māori	28.29	2.42	2.06–2.83
Deciles 3–4	6.94	1.89	1.22–2.92	Pacific	24.36	2.08	1.66–2.60
Deciles 5–6	12.86	3.50	2.36–5.19	Asian/Indian	5.25	0.45	0.30–0.67
Deciles 7–8	22.24	6.06	4.17–8.79	European/Other	11.71	1.00	
Deciles 9–10	31.66	8.62	6.00–12.4	Gender			
				Female	13.36	1.00	
				Male	19.47	1.46	1.26–1.69

Source: Numerator: National Minimum Dataset (emergency department cases excluded); Denominator: Statistics NZ Estimated Resident Population; Rates are per 100,000 0–14 year olds; Rate ratios are unadjusted; Ethnicity is level 1 prioritised

Nature of injuries from assault, neglect or maltreatment

Traumatic subdural haemorrhage was the most common primary diagnosis recorded for hospitalisations of children aged under 5 years as a result of assault, neglect or maltreatment; other head injuries, injuries to the abdomen lower back and pelvis, and injuries to the upper limb were also common in this age group. For children aged 5–9 years head injuries and injuries to the abdomen lower back and pelvis were the most common primary diagnoses. Skull or facial fractures, concussion, and injuries to the abdomen lower

back and pelvis were the most common primary diagnoses for children aged 10–14 years
(Table 12).

Table 12. Nature of injuries arising from injuries arising from the assault, neglect, or maltreatment of hospitalised 0–14 year olds, by age group, New Zealand 2010–2014

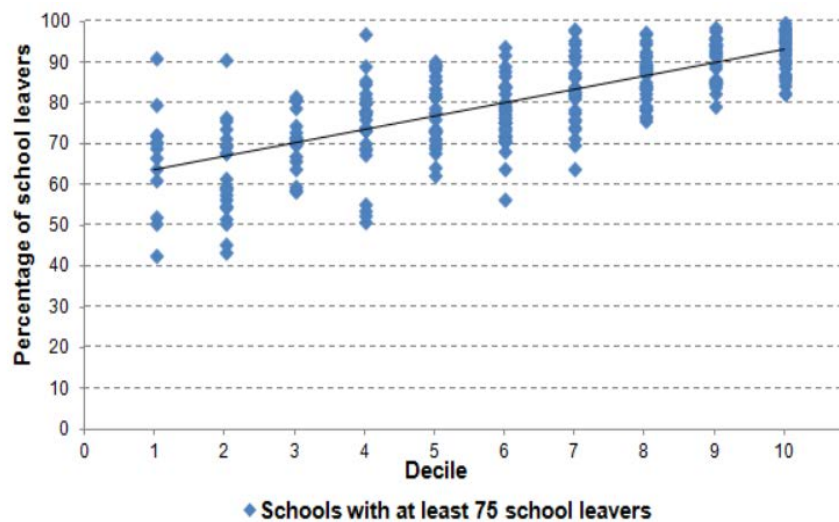
Primary diagnosis	Number: total 2010–2014	Number: annual average	Rate per 100,000 0– 14 year olds	Per cent of category
Assault, neglect, or maltreatment hospitalisations				
0–4 year olds				
Traumatic subdural haemorrhage	80	16.0	5.19	21.3
Superficial head injury	71	14.2	4.61	18.9
Fracture skull or facial bones	16	3.2	1.04	4.3
Other head injuries	44	8.8	2.85	11.7
Injuries to abdomen, lower back, and pelvis*	32	6.4	2.08	8.5
Injuries to upper limb	33	6.6	2.14	8.8
Fractured femur	13	2.6	0.84	3.5
Other injuries to lower limb	7	1.4	0.45	1.9
Maltreatment	45	9.0	2.92	12.0
Other injuries	35	7.0	2.27	9.3
Total	376	75.2	24.40	100.0
5–9 year olds				
Superficial head injury	19	3.8	1.27	19.0
Other head injuries	22	4.4	1.47	22.0
Injuries to abdomen, lower back, and pelvis*	18	3.6	1.20	18.0
Injuries to upper limb	8	1.6	0.54	8.0
Other injuries to lower limb	6	1.2	0.40	6.0
Maltreatment	8	1.6	0.54	8.0
Other injuries	19	3.8	1.27	19.0
Total	100	20.0	6.69	100.0
10–14 year olds				
Fracture skull or facial bones	51	10.2	3.41	18.8
Concussion	38	7.6	2.54	14.0
Superficial head injury	22	4.4	1.47	8.1
Other head injuries	37	7.4	2.48	13.7
Injuries to thorax (including rib fractures)	9	1.8	0.60	3.3
Injuries to abdomen, lower back, and pelvis	22	4.4	1.47	8.1
Injuries to upper limb	41	8.2	2.75	15.1
Injuries to lower limb	16	3.2	1.07	5.9
Maltreatment	9	1.8	0.60	3.3
Other injuries	26	5.2	1.74	9.6
Total	271	54.2	18.14	100.0

Source: Numerator: National Minimum Dataset (emergency department cases excluded); Denominator: Statistics NZ Estimated Resident Population. Note: *includes injuries to thorax (including rib fractures)

Educational attainment

Socioeconomic background has a significant effect on educational outcomes in New Zealand and underpins observed variation in student performance.³⁶ 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.³⁷ The Ministry of Education notes that although there is a clear positive correlation between the socio-economic mix of a school and educational achievement, there is also a great deal of variation between schools in each decile such that in some schools in the lowest deciles a higher proportion of students achieve an NCEA level 2 qualification or above compared with some schools in the highest deciles, as illustrated below.³⁸

Percentage of school leavers with at least an NCEA Level 2 qualification or equivalent, by school decile, 2014.



Source: Education counts (2015) http://www.educationcounts.govt.nz/_data/assets/pdf_file/0019/6409/NCEA-Level-2-Indicator-Report.pdf

The following section uses Ministry of Education data to review the educational attainment of school leavers from 2009–2014.

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

Data sources

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

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

Denominator: Number of school leavers in a given year

Notes on interpretation

Note 1: The National Certificate of Educational Achievement (NCEA) is part of the National Qualifications Framework.

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

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

For further detail refer to <http://www.educationcounts.govt.nz/indicators/definition/education-and-learning-outcomes/28879> and <http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/understanding-ncea/the-facts/factsheet-4/>

Note 2: These data follow a new definition of school leavers from the Ministry of Education's ENROL system utilised from 2009 onwards so comparison with previous years is not possible.

Note 3: Ethnicity is total response so individual students may appear in more than one ethnic group.

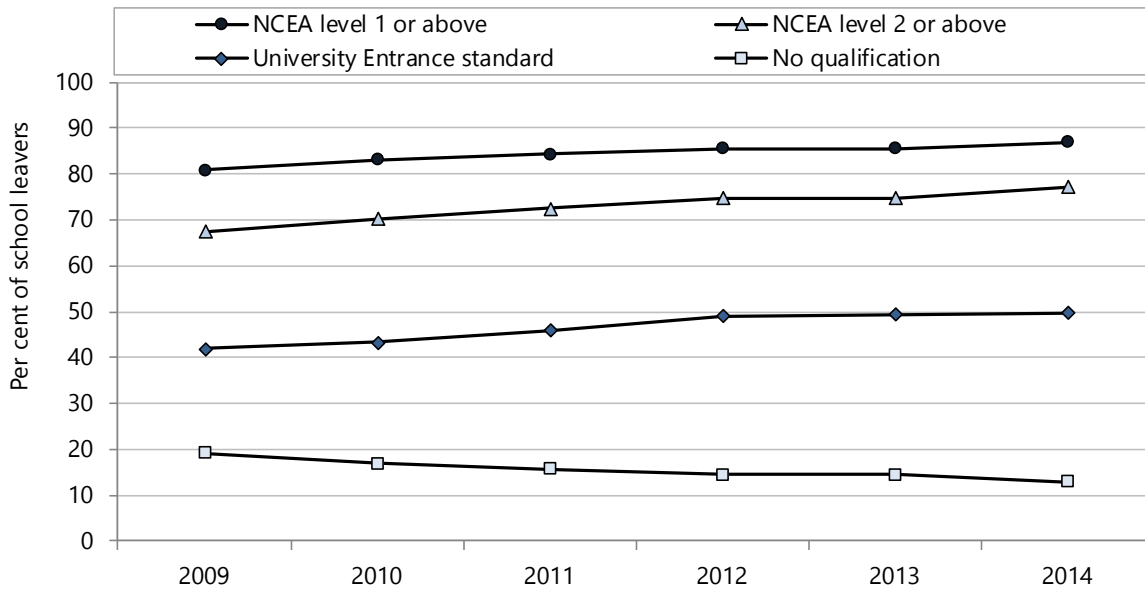
Note 4: Listed qualification levels include the NZ Qualifications Framework (NZQF) as well as other equivalent qualifications that are non-NZQF.

Note 5: School socioeconomic decile: All schools are assigned a decile ranking based on the socioeconomic status of the areas they serve. These rankings are based on census data from families with school age children in the areas from which the school draws its students. Census variables used in the ranking procedure include equivalent household income, parent's occupation and educational qualifications, household crowding and income support payments. Schools are assigned a decile ranking, with decile 1 schools being the 10% of schools with the highest proportion of students from low socioeconomic communities and decile 10 schools being the 10% of schools with the lowest proportion of these students. Decile ratings are used by the Ministry of Education to allocate targeted funding, as well as for analytical purposes.

Patterns over time

From 2009–2014 the proportion of school-leavers with no qualification has decreased from 19.2% to 13.0%, with an increase in the percentage of students achieving NCEA level 1 (80.8% to 87%), NCEA level 2 (67.5% to 77.1%) and University Entrance Standard (40% to 49.6%) (**Figure 31**).

Figure 31. Highest educational attainment of school leavers, New Zealand 2009–2014

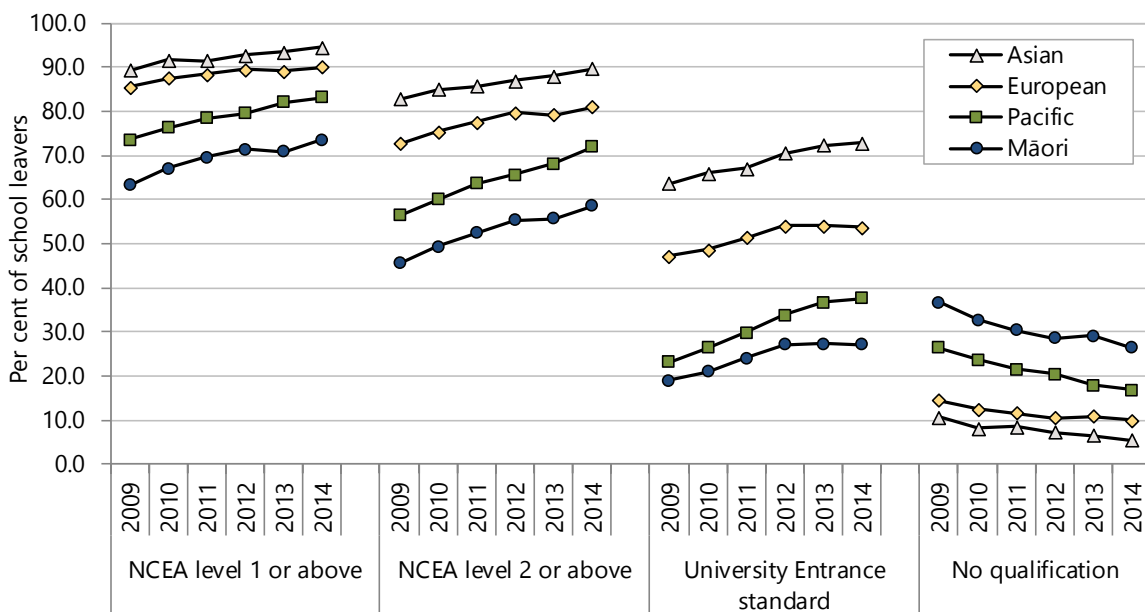


Source: Ministry of Education ENROL

Patterns by ethnicity

There was ethnic disparity in educational achievement from 2009–2014, with Māori and Pacific students less likely than European students to achieve NCEA level 1 or 2 or the University Entrance standard, and more likely to leave school with no qualifications. Asian students were more likely than European students to achieve NCEA level 1 or 2 or the University Entrance standard, and less likely to leave school with no qualifications (**Figure 32**).

Figure 32. Educational attainment of school leavers, by ethnicity, New Zealand 2009–2014

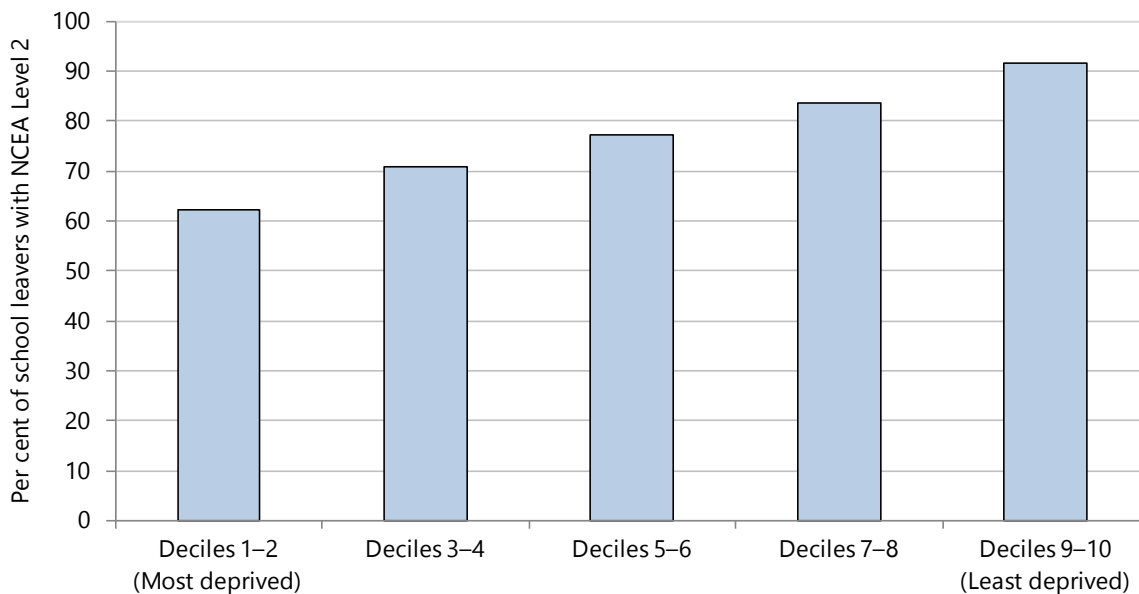


Source: Ministry of Education ENROL. Note: Ethnicity is total response ethnicity, such that students been counted in each ethnic group they belong to

The Ministry of Education uses school deciles as a measure of the socio-economic position of a student community: Decile 1 schools are the 10% of schools with the highest proportion of students from low socio-economic communities measured by low household income, low-skilled parental employment, household crowding, parents with no educational qualifications and parents receipt of income support benefits.³⁹ In 2014 there was a social gradient in educational achievement, with 62.5% of students achieving the NCEA level 2 standard or higher in schools that draw their students from communities with the highest degree of socio-economic disadvantage (Decile 1–2 schools) compared with 91.5% of students in the highest school deciles (9–10) (**Figure 33**).

While there have been improvements in the percentage of students achieving NCEA level 2 or above across all school deciles, on average, the gap between students from the most to the least disadvantaged schools continues.

Figure 33. School leavers with NCEA Level 2 standard by school socioeconomic decile, New Zealand 2014



Source: Ministry of Education ENROL

Housing

Housing is critically related to child poverty. High cost of housing often means low income families live in poor quality housing, and this is a cause of many health issues for children. Crowding is linked to spread of infectious disease and also impacts on children's mental health, social wellbeing and school performance.

Household Crowding

Household crowding is more common among low-income households⁴⁰ and has been linked to several health conditions including communicable diseases such as gastroenteritis, hepatitis A and B, and respiratory infections.⁴¹ The following section uses data from the 2001, 2006 and 2013 Censuses to review household crowding for children in New Zealand.

Data source and methods

Indicator

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

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

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

Data source

New Zealand Census

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.

Note 2: The Canadian National Occupancy Standard (CNOS) definitions were developed to enable the calculation of person-to-bedroom ratios for households of differing sizes and compositions.⁶ 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.⁶

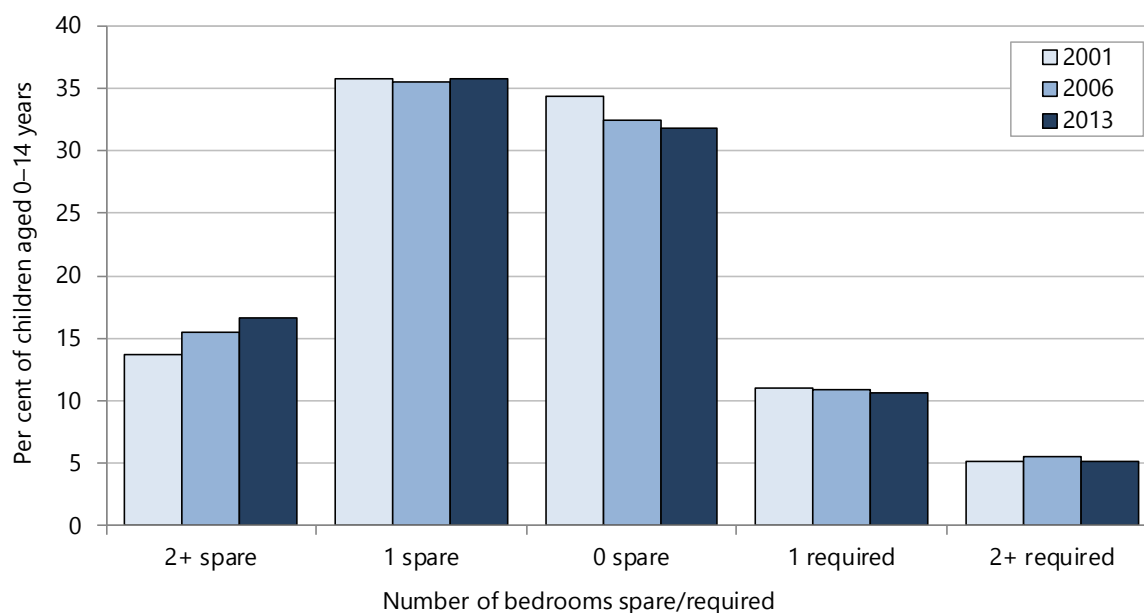
The CNOS was used in the 2001, 2006 and 2013 NZ Censuses, and households were reported as having two plus, one or no bedrooms spare, or as requiring an additional one, or two plus bedrooms. Households needing one or two plus additional bedrooms are deemed to be crowded.⁶

Note 3: The NZ Index of Deprivation (NZDep2013, see Appendix 5) uses household crowding as one of the nine variables to create deprivation scores. Household crowding can therefore be expected to exhibit a social gradient by NZDep2013. However, it is the degree of the crowding experienced by children in each NZDep2013 decile which is likely to have the greatest impact on their housing related health outcomes.

Patterns over time

Most New Zealand children aged 0–14 years live in households with adequate or spare bedrooms. The proportion of children living in households requiring one or more additional bedrooms (crowded households) did not change markedly between Censuses. It was 16.2% in 2001, 16.4% in 2006 and fell slightly to 15.8% in 2013. At the 2013 Census 85,578 (10.7%) children lived in households requiring one additional bedroom and 44,613 (5.1%) in households requiring two or more additional bedrooms (**Figure 34**).

Figure 34. Percentage of children aged 0–14 years by the number of bedrooms spare or required in their household, New Zealand at the 2001, 2006 and 2013 Censuses



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

Patterns by sociodemographic factors

There was ethnic disparity in household crowding with Pacific, Māori and Asian children *significantly* more likely than European children to live in a crowded house. This ethnic disparity was evident in each decile of NZDep2013 scores (**Table 13**).

There was a strong and statistically *significant* social gradient in household crowding with the proportion of children living in crowded households rising with increasing scores on the New Zealand Index of Deprivation (NZDep) from 2.1% of children in areas with the lowest scores (NZDep decile 1) to 42.8% of children living in areas with the highest scores (NZDep decile 10) (**Table 13**).

Table 13. Number and percentage of children aged 0–14 years living in crowded households by ethnicity and NZDep2013 decile, New Zealand at the 2013 Census

	Number of children	Percent of children	Rate ratio	95% CI
Ethnicity				
Māori	47,724	24.8	5.21	5.13–5.29
Pacific	33,576	46.8	9.85	9.70–10.01
Asian/Indian	17,919	20.8	4.37	4.29–4.46
European	19,839	4.8	1.00	
NZ Index of Deprivation 2013 decile				
Decile 1	1,806	2.1	1.00	
Decile 2	3,423	4.2	1.97	1.86–2.09
Decile 3	4,734	6.0	2.86	2.71–3.01
Decile 4	6,267	8.2	3.87	3.67–4.07
Decile 5	7,671	10.1	4.80	4.56–5.05
Decile 6	9,744	13.1	6.18	5.89–6.50
Decile 7	11,613	15.8	7.47	7.12–7.85
Decile 8	15,858	21.0	9.94	9.47–10.42
Decile 9	23,373	28.3	13.38	12.77–14.03
Decile 10	42,078	42.8	20.26	19.35–21.22

Source: Statistics New Zealand; Note: Ethnicity is level 1 prioritised; NZDep2013 is NZDep2013 index of deprivation; See Note 3 in Methods box for further interpretation.

Housing affordability

High housing costs relative to income are often associated with financial stress, particularly for lower income households, as meeting housing costs can leave insufficient money to cover other basic needs such as food, clothing, transport, medical care and education. Households that spend more than 30% of income on accommodation are said to have a high 'outgoings-to-income' ratio or OTI.³ The following section uses data from the Statistics New Zealand Household Economic Survey to review the proportion of households spending more than 30% of their income on housing costs.

Data source and methods

Definition

1. Proportion of households spending more than 30% of their income on housing costs by income quintile
2. Proportion of individuals in households spending more than 30% of their income on housing costs by age
3. Housing costs as a proportion of income for Accommodation Supplement recipients

Data source

New Zealand Household Economic Survey (NZHES) via Perry 2015.³ Note: Housing cost measures are reported on by the Ministry of Social Development using NZHES data. For more detail on methodology see Perry 2015.³

Interpretation

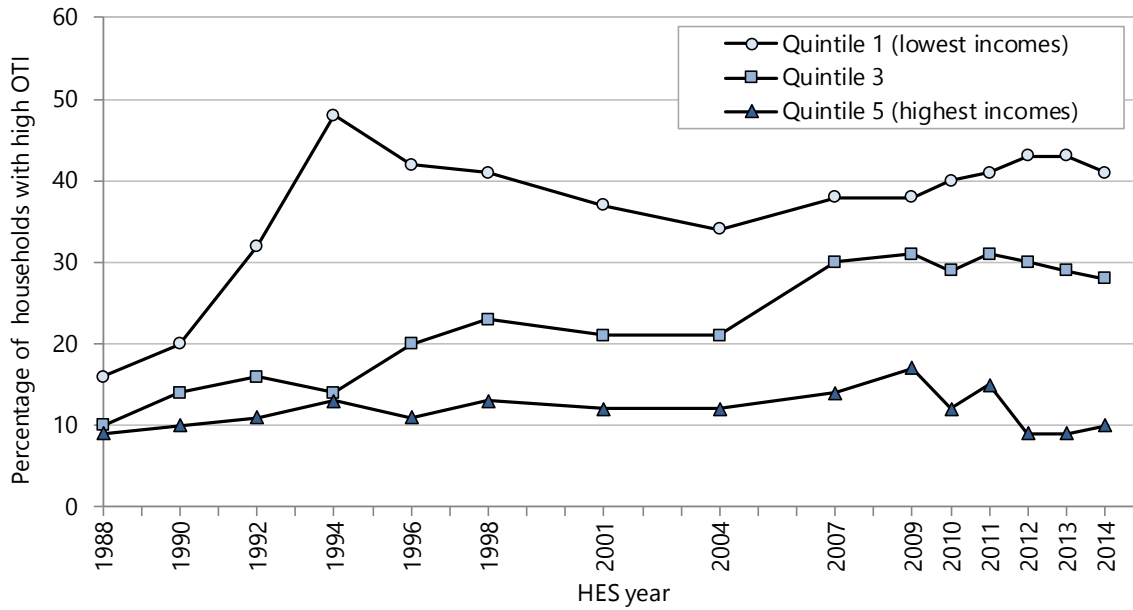
Note 1: Housing costs include all mortgage outgoings (principal and interest) together with rent and rates for all household members. Repairs, maintenance and dwelling insurance are not included. Any housing-related cash assistance from the government is included in household income.³

Note 2: Variations in housing costs do not necessarily correspond to similar variations in housing quality. This is because many older individuals live in good accommodation with relatively low housing costs, for example, those living in mortgage-free homes, whereas many in an earlier part of the life cycle have a similar standard of accommodation but relatively high accommodation costs.³

Patterns over time

Low and middle-income New Zealand households are more likely than high income households to spend more than 30% of their income on housing costs. During the period 1988-2014, this disparity was highest in 1994, when 48% of households in the lowest income quintile had a high outgoings to income ratio (OTI) compared with 13-14% of households in the middle and highest income quintiles. The proportion of households in the lowest income quintile with a high OTI fell to 41% in 2014. From 1988 to 2014 the proportion of households in the middle income quintile with a high OTI increased from 10% to 28% while the proportion of households in the highest income quintile with a high OTI was mainly stable at around 10%, increasing to 17% in 2009 around the time of the global financial crisis (**Figure 35**).

Figure 35. Percentage of households spending more than 30% of their income on housing costs by income quintile, New Zealand 1988–2014 NZHES years

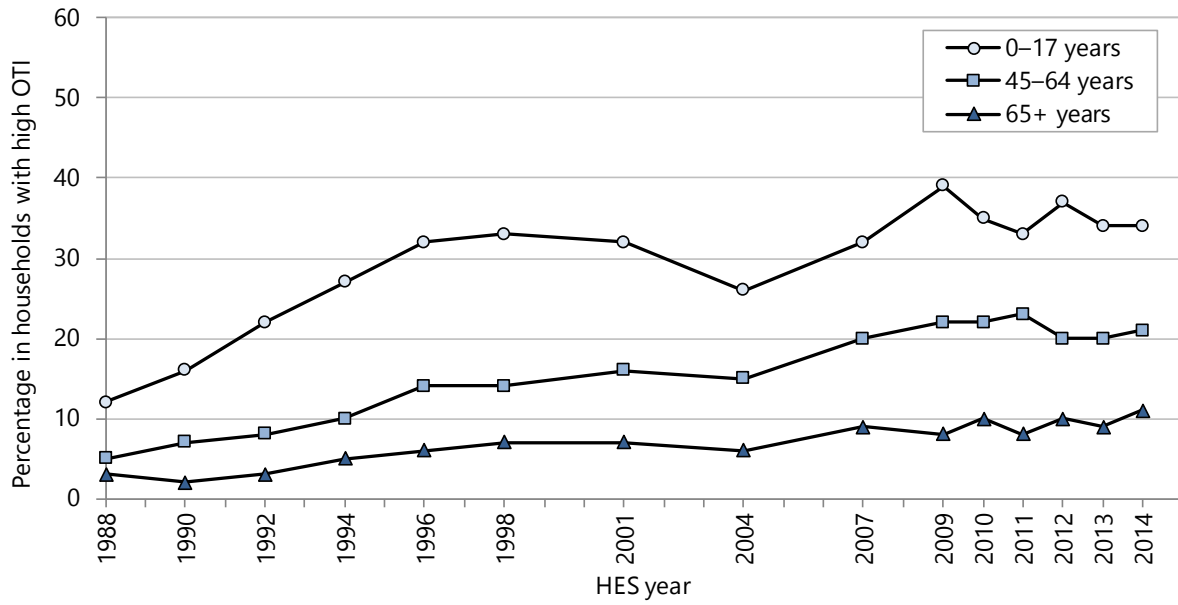


Source: Perry (2015), derived from Statistics NZ Household Economic Survey (HES). Note High OTI = high outgoings to income ratio which means the household spent more than 30% of their income on housing costs

Patterns by sociodemographic factors

Analysis at an individual level shows that from 1988–2014 the proportion of individuals living in households that spend more than 30% of income on housing costs has risen in all age groups. The 0–17 year age group had the highest proportion of individuals in households with a high OTI and similarly high proportions were seen for individuals aged 18–24 and 25–44 years. A number of these individuals were likely to be parents living in the same households as those aged 0–17 years (**Figure 36**). The rates for the age groups 18–24 and 25–44 years are not shown in **Figure 36** due to significant overlap with the 0–17 years age group.

Figure 36. Percentage of individuals in households spending more than 30% of their income on housing costs by age group, New Zealand 1988–2014 NZHES years



Source: Perry, derived from Statistics NZ Household Economic Survey (HES). Note: Rates for those aged 18–24 and 25–44 years were very similar to those aged 0–17 years.

Wider NZ context

This section of the Child Poverty Monitor brings together data from several sources, each giving valuable insights into causes and effects of child poverty in New Zealand. The first two subsections look at aspects of housing - household affordability and household crowding. High housing costs relative to income are often associated with financial stress, as meeting housing costs can leave insufficient money to cover other basic needs such as food, clothing, transport, medical care and education. Household crowding has been linked to several health conditions including communicable diseases such as gastroenteritis, hepatitis A and B, and respiratory infections.⁴¹

Following subsections assess changes over time in New Zealand's economic growth relative to average pay rates, and the unemployment rate at present, and in the recent past. A rise in the unemployment rate is a key marker of an economic downturn in a community, with effects on a wide range of outcomes for all children and young people in a community, not only for those directly affected by job loss within their own household.⁴² The number of children reliant on benefit recipients is also examined - children in New Zealand households where the main income is from an income support benefit are more likely than other children to experience material deprivation and to live in income-poor households.⁴³

Socioeconomic background has a significant effect on educational outcomes in New Zealand and underpins observed variation in student performance.³⁶ The final subsection summarises educational attainment in school leavers from 2009–2014.

Income inequality

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’”.ⁱⁱ

There has been much debate regarding the influence of income inequality on population health. The World Health Organization’s Commission on Social Determinants of Health noted that “the structural determinants and conditions of daily life constitute the social determinants of health and are responsible for a major part of health inequities between and within countries”.²⁸ Research has shown that people with higher socioeconomic position in society have more chance of experiencing better health. For example, Wilkinson and Marmot⁴⁴ cite the Whitehall studies of British civil servants that found that mortality increased in a stepwise manner as relative socioeconomic status decreased, and that social gradients were evident even amongst those who were not poor.⁴⁴ In addition, they note that while health inequalities exist within societies, there is little association between average income (as measured by GDP per capita) and life expectancy across rich countries. Rather, there appears to be a strong correlation between income inequality and mortality.

The authors of the Marmot Review “Fair Society, Healthy Lives” identified health inequalities as arising from inequalities of income, education, employment and neighbourhood circumstances. They argue that these inequalities are unfair but they are not inevitable.⁴⁵ The review does not present income inequalities as the only reason for health inequality but concurs with the view that income inequalities affect the lives people can lead.⁴⁶ For example, in England life expectancy in the poorest neighbourhoods is, on average, seven years less than in rich areas. In addition, people in the poorest areas are likely to have, on average, 17 fewer disability-free years than those in the richest neighbourhoods. Similar relationships can be found for indicators in education, occupation and housing conditions.⁴⁵

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

ⁱⁱ Perry 2014² page 16.

Data source and methods

Definition

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

Data Source

Statistics New Zealand Household Economic Surveys (NZHES n=2,800–3,500 households per survey) via Perry 2015.²

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 2015.²

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 inequality² 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.

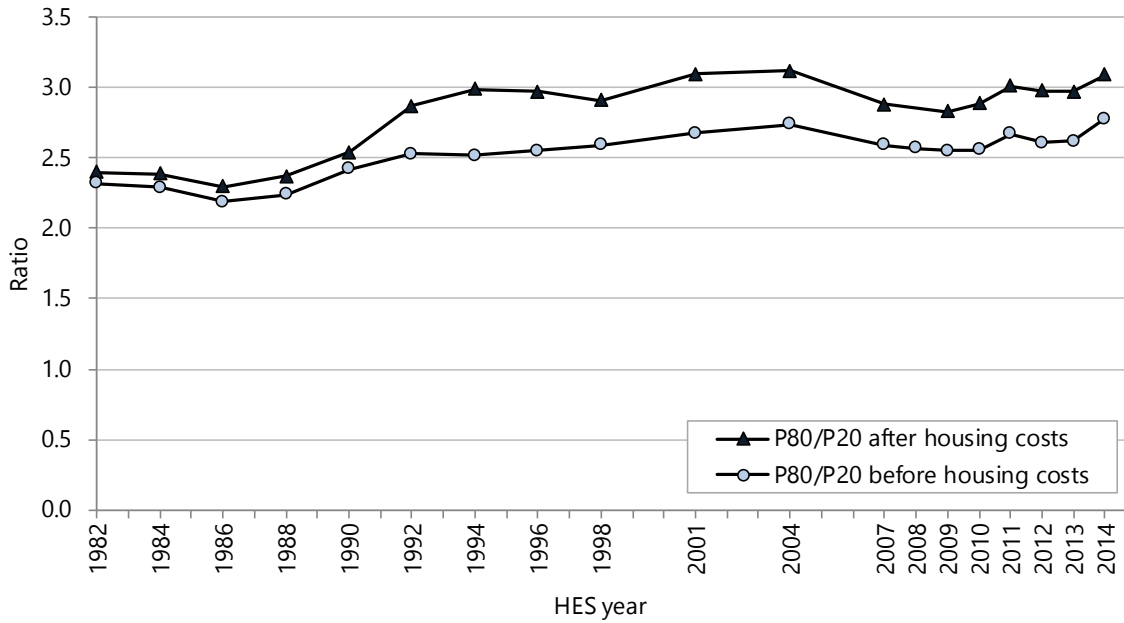
Gini Coefficient: The Gini coefficient is another common measure of inequality used internationally. It gives a summary of income differences between individuals in the population. When the Gini coefficient = 0, all people have the same level of income. When it approaches 1, one person receives all the 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 100¹⁷ 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.² For more detail on calculating the Gini coefficient see The World Bank.¹⁸

Patterns over time

The P80/P20 ratio

Income inequality, as measured by the P80/P20 ratio, is presented in **Figure 37** with both before and after adjusting for housing costs. Housing costs generally make up a greater proportion of household income for households on lower incomes than those on higher incomes and throughout the period between 1982 and 2014. The P80/P20 ratio was higher after housing costs than before housing costs. 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. Perry notes some ‘volatility in the index’ but notes that it may take one or two further surveys before the post-crisis inequality level becomes clear² (**Figure 37**).

Figure 37. Income inequality in New Zealand as assessed by the P80/P20 ratio for the 1982–2014 NZHES years

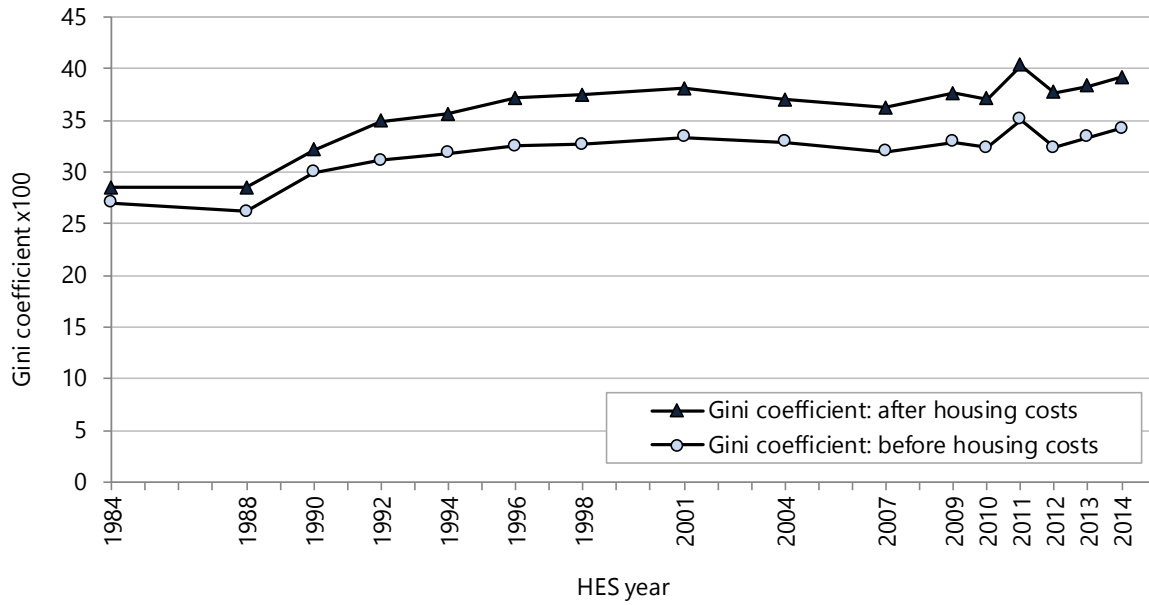


Source: Source: Perry 2015² derived from Statistics NZ Household Economic Survey (HES) 1984–2014

The Gini Coefficient

The Gini coefficient was also higher after adjusting for housing costs, for the same reasons as given above for the P80/P20 ratio. The same patterns are seen with the most rapid rises in income inequality showing on the graph between the late 1980s and early 1990s, the slight decline between 2001 and 2007, and a greater degree of volatility during 2009–2014 period. Perry attributes this latter 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. Perry notes that the overall trend line for this period was flat² **(Figure 38)**.

Figure 38. Income inequality in New Zealand as assessed by the Gini Coefficient for the 1984-2014 NZHES years



Source: Source: Perry 2015² derived from Statistics NZ Household Economic Survey (HES) 1984-2014

Gross domestic product and average hourly earnings

The gross domestic product (GDP) remains the official measure of economic growth in New Zealand.¹⁴ Economic reforms in the decade from 1984–1994⁴⁷ were intended to enhance long-term economic performance and have successfully halted a decline in GDP per capita, but also contributed to large increases in income inequality and poverty, aggravated by the rising burden of housing costs on low-income households.³⁶

Data sources and methods

Indicators

1. Real per capita gross domestic product (RPC-GDP)
2. Real ordinary time average hourly earnings (ROT-AHE)

Data sources

1. Numerator: Base series 1975–1987Q1 from¹ 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: McDermott and Hall (2009)⁷; 1977–1987: Statistics NZ, SNBQ.S2SZT; Base series 1987Q2–current: Statistics SNEQ.SG01RSC00B01. 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.
1. Denominator: Base series 1975–1990 from¹ 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 Statistics NZ, de facto population, DPEQ.SBEC; 1991–current: Statistics NZ, estimated resident population DPEQ.SDAC.
2. 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.

Notes on interpretation

Note 1. GDP is New Zealand's official measure of economic growth. The production approach to GDP that is used in this section of the Child Poverty Monitor measures the total value of goods and services produced in New Zealand, after deducting the cost of goods and services used in the production process.¹⁴

Note 2. 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.¹⁶ Per capita real GDP divides the national GDP by the population.

Note 3. 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.^{19, 20}

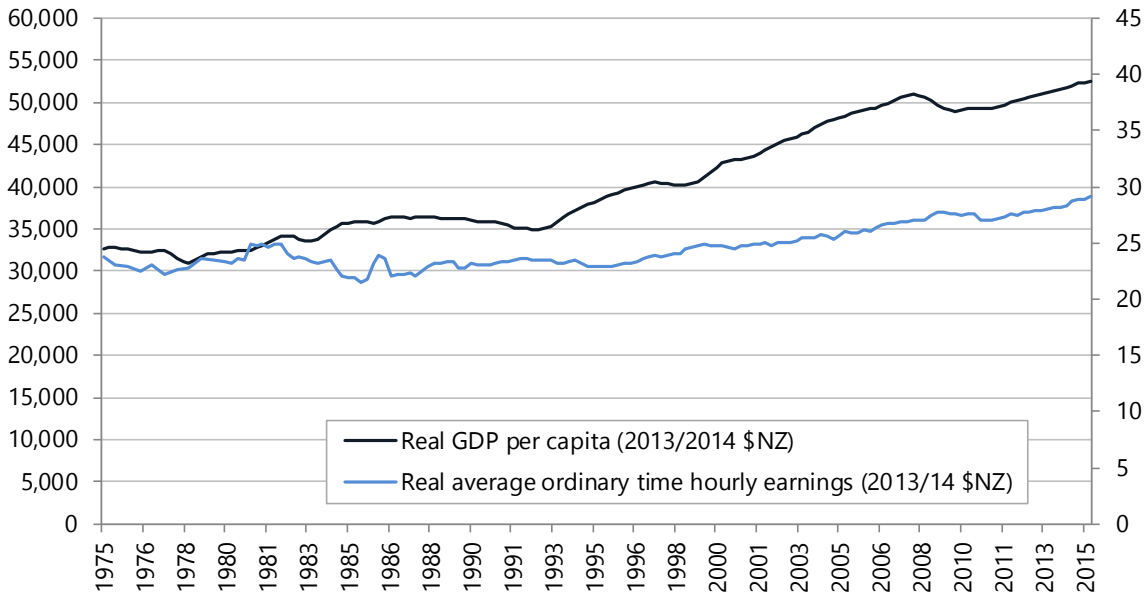
Note 4. While the different data series used to develop a composite AHE data set may have had different underlying methodologies, this is not likely to have a significant effect on the overall pattern of quarterly change in AHE.

Note 5. 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.

Patterns over time

This analysis shows that increases in hourly earnings have not kept pace with economic growth over the period 1975–2015. In 2013/14 New Zealand dollars, real GDP per capita increased from \$32,719 in the March quarter of 1975, to \$52,447 in the June quarter of 2015, while real average ordinary time hourly earnings only increased from \$23.81 to \$29.20 during the same period (**Figure 39**).

Figure 39. Real gross domestic product (GDP) per capita and real average ordinary time hourly earnings, New Zealand March quarter 1975 to June quarter 2015



Source: Lattimore & Equb (2011)¹ and Statistics New Zealand; Note: Figures are expressed in 2013/14 \$NZ.

Unemployment

A rise in the unemployment rate is a key marker of an economic downturn in a community, effecting a wide range of outcomes for all children and young people in a community.⁴² Parental unemployment can have significant effects on children's wellbeing and may lead to income poverty or material hardship, especially if the unemployed parent is the sole earner.⁴⁸

The following section uses data from Statistic New Zealand's Household Labour Force Survey to review unemployment rates from 1986–2015.

Data source and methods

Indicator

Unemployment rate: The number of unemployed people expressed as a percentage of the labour force

Data sources

Statistics New Zealand Household Labour Force Survey ($n \approx 15,000$ households). Quarterly since March 1986 and available on Statistics New Zealand's website <http://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, available for work and had either actively sought work in the past four weeks ending with the reference week, or had a new job to start within four weeks.⁵

Note 2: The official unemployment statistics do not include other 'jobless' people such as those who are available but not actively seeking work, those seeking work through newspaper advertisements only, and those actively seeking but not available for work.⁵

Note 3: Seasonal adjustment is the process of estimating and removing the varying seasonal effects from a time series in order to reveal the underlying behaviour of the series, thus enabling comparison of data for adjacent months or quarters.¹³ Each quarter the seasonal adjustment process is applied to the latest quarter and all previous quarters, which means that seasonally adjusted estimates for previous quarters may change slightly.⁵

Patterns over time

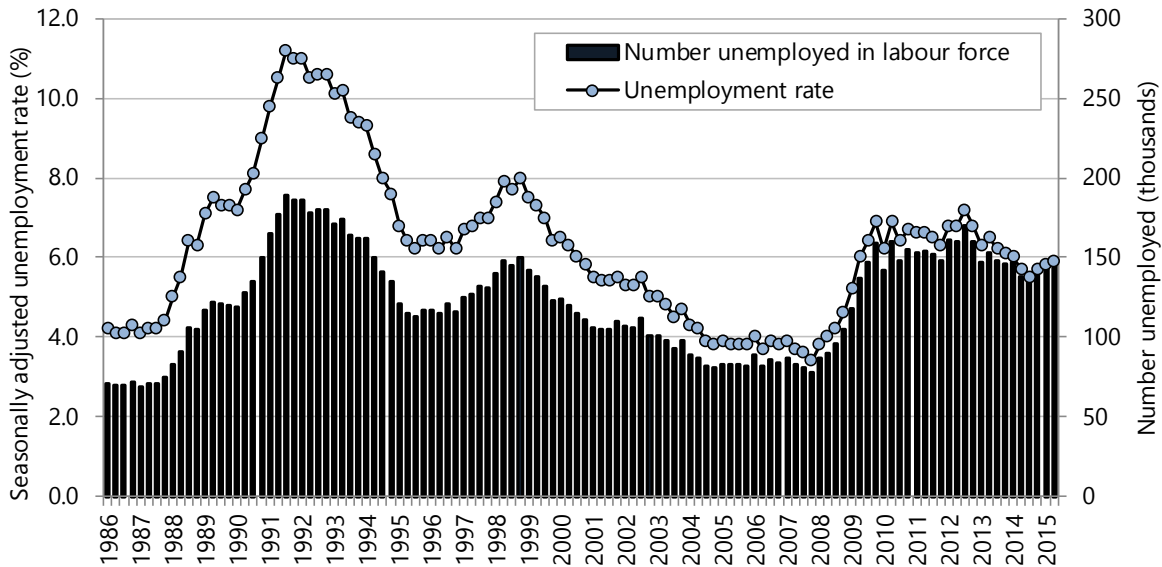
The seasonally adjusted unemployment rate has remained under 6% since June 2014 although there has been a slight rise from 5.5% in September 2014 to 5.9% in June 2015. Over the past 30 years the highest unemployment rate was observed in 1991 (11.2%) and the lowest unemployment rate in 2007 (3.4%). In June 2015 there were 148,000 New Zealanders who were officially unemployed (**Figure 40**).

Patterns by sociodemographic factors

Unemployment rates differ by age, with the highest rates observed for young people aged 15–19 years, followed by young people aged 20–24 years. In June 2015 the unemployment rate for young people aged 15–19 years was 20.7% compared with a rate of 4.1% for adults aged 45–49 years (**Figure 41**).

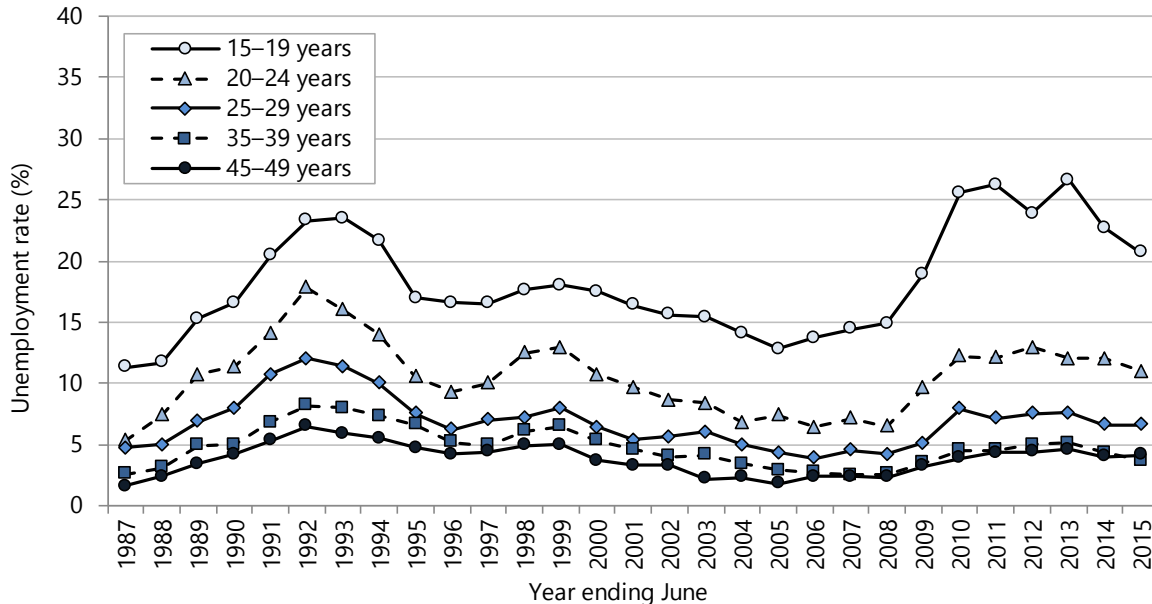
Since 2008 unemployment rates for Māori and Pacific New Zealanders have risen more than unemployment rates for other New Zealanders. In June 2015 the unemployment rate for Māori was 12.6% and for Pacific peoples 11.3% compared with 4.3% for Europeans (Figure 42).

Figure 40. Seasonally adjusted quarterly unemployment rates, New Zealand March 1986 to June 2015



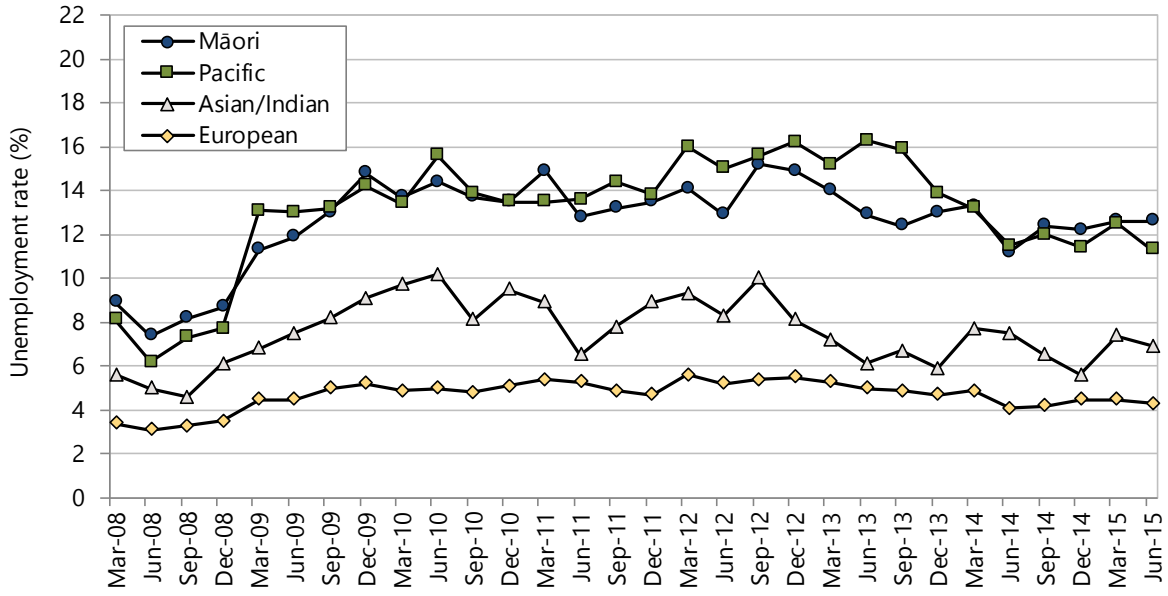
Source: Statistics New Zealand, Household Labour Force Survey

Figure 41. Unemployment rates by age (selected age groups), New Zealand 1987-2015 (years ending June)



Source: Statistics New Zealand Household Labour Force Survey

Figure 42. Quarterly unemployment rates by ethnicity, New Zealand March 2008–2015 (years ending June) Statistics New Zealand Household Labour Force Survey



Source: Statistics New Zealand Household Labour Force Survey

Children reliant on benefit recipients

Children in New Zealand households where the main income is from an income support benefit are more likely than other children to experience material deprivation and to live in income-poor households.⁴³ The following section uses aggregate data from the Ministry of Social Development to review the proportion of children who are reliant on a benefit recipient.

Data source and methods

Indicator

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

Data sources

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.⁴ 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: Welfare reform in July 2013 introduced three new benefits (Jobseeker Support, Sole Parent Support, and Supported Living Payment), which replaced many of the previously existing benefits, and changed the obligations to be met by benefit recipients. The welfare reform changes have been described at <https://www.msd.govt.nz/about-msd-and-our-work/work-programmes/welfare-reform/july-2013/>

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

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

From 2014, “Other benefits” included: Emergency Benefit, Youth Payment, Young Parent Payment,

Patterns over time

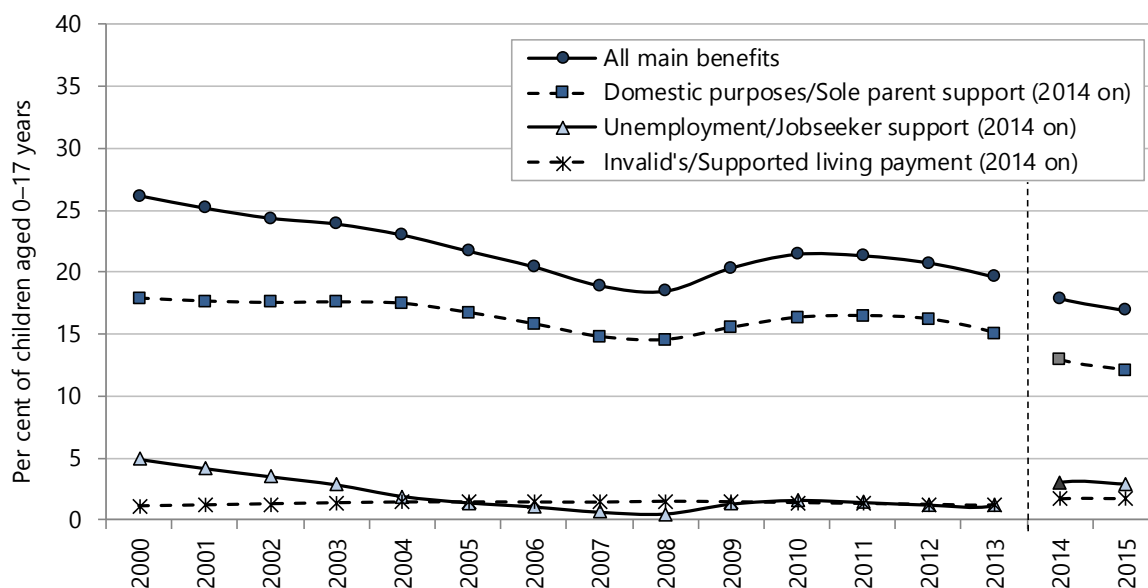
The number and proportion of children aged 0–17 years who were reliant on a benefit recipient declined from 271,463 children (26.2%) in June 2000 to 185,532 children (16.9%) in June 2015. In June 2015 most of these children (132,201; 71.3%) were reliant on a recipient of sole parent support, with the remainder reliant on recipients of jobseeker support (32,076; 17.3%), supported living payments (18,684; 10.1%) or other benefits (2,571; 1.4%) (**Table 14; Figure 43**).

Table 14. Number of children aged 0–17 years who were reliant on a benefit recipient by benefit type, New Zealand, June 2000–2015

Year	Domestic Purposes		Unemployment		Invalid's		Sickness		Other benefits		Total
	Number	Per cent*	Number	Per cent*	Number	Per cent*	Number	Per cent*	Number	Per cent*	Number
2000	185,658	17.9	51,124	4.9	11,205	1.1	11,425	1.1	12,051	1.2	271,463
2001	184,448	17.7	43,688	4.2	12,164	1.2	11,155	1.1	11,468	1.1	262,923
2002	184,497	17.5	36,960	3.5	13,290	1.3	11,836	1.1	9,611	0.9	256,194
2003	186,288	17.6	30,257	2.9	14,306	1.4	12,477	1.2	9,701	0.9	253,029
2004	186,372	17.5	20,413	1.9	15,091	1.4	13,782	1.3	9,711	0.9	245,369
2005	179,791	16.7	14,968	1.4	15,277	1.4	13,892	1.3	9,267	0.9	233,195
2006	171,011	15.8	11,422	1.1	15,291	1.4	13,775	1.3	9,598	0.9	221,097
2007	160,137	14.8	6,800	0.6	15,197	1.4	13,509	1.2	9,394	0.9	205,037
2008	157,693	14.5	5,243	0.5	16,045	1.5	11,980	1.1	9,564	0.9	200,525
2009	168,709	15.5	13,943	1.3	15,605	1.4	13,025	1.2	9,855	0.9	221,137
2010	177,874	16.3	17,281	1.6	14,840	1.4	13,798	1.3	9,840	0.9	233,633
2011	179,784	16.5	15,486	1.4	14,044	1.3	13,351	1.2	10,144	0.9	232,809
2012	177,237	16.2	13,205	1.2	13,287	1.2	12,955	1.2	10,212	0.9	226,896
2013	165,113	15.1	12,622	1.2	12,804	1.2	12,590	1.1	11,617	1.1	214,746
	Sole Parent Support (incl EMA ¹)		Jobseeker Support		Supported Living Payment				Other benefits		Total
	Number	Per cent*	Number	Per cent*	Number	Per cent*			Number	Per cent*	Number
2014	141,468	12.9	33,447	3.0	18,502	1.7			2,830	0.3	196,247
2015	132,201	12.0	32,076	2.9	18,684	1.7			2,571	0.2	185,532

Note: Source: Numerator: MSD SWIFTT Database; Denominator: Statistics NZ Estimated Resident Population; Per cent* refers to proportion of New Zealand 0–17 year olds that are reliant on benefit recipients; EMA¹ = Emergency Maintenance Allowance; 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, Unemployment Benefit Student Hardship, NZ Superannuation, Veterans and Transitional Retirement Benefit

Figure 43. Percentage of all children aged 0–17 years who were reliant on a benefit recipient, New Zealand, as at end of June 2000–2015

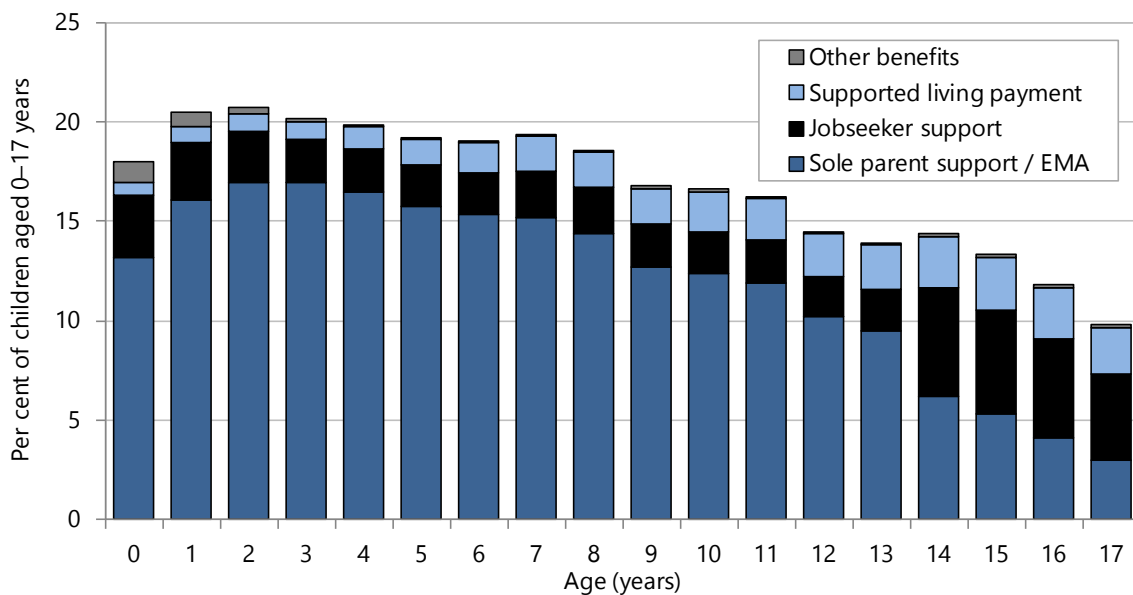


Source: Numerator: MSD SWIFTT Database; Denominator: Statistics NZ Estimated Resident Population; Note: The benefits prior to the June 2013 reform are not directly comparable with the benefits as at June 2014, see Note 3 in Methods box.

Patterns by age

In June 2015 the proportion of children aged 1-17 years who were reliant on a benefit recipient tended to decline with age, from more than 20% of children aged 1–3 years, to less than 15% of children aged 12-16 years and less than 10% of children aged 17 years (**Figure 44**). The proportion of children reliant on a recipient of sole parent support declined from around 16% of children aged 0–5 years to 12.3% of children aged 10 years, 5.3% of children aged 15 years and 3% of children aged 17 years (**Figure 44**). From the age of 14 years the proportion of children reliant on a recipient of sole parent support was lower than the proportion of children reliant on recipients of jobseeker support, supported living payments and other benefits combined (**Figure 44**).

Figure 44. 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 2015



Source: Numerator: MSD SWIFTT Database; Denominator: Statistics NZ Estimated Resident Population; “Other benefits” included: Emergency Benefit, Youth Payment, Young Parent Payment, Unemployment Benefit Student Hardship, NZ Superannuation, Veterans and Transitional Retirement Benefit.

Appendix 1: Methods used to develop the Child Poverty Monitor

The indicators reported upon in the Child Poverty Monitor (2013-2015) combine measures of child poverty recommended by the 2012 Children's Commissioner's Expert Advisory Group on Solutions to Child Poverty,⁴⁹ with children's health and well-being measures recorded in the annual Children's Social Health Monitor produced by the NZ Child and Youth Epidemiology Service from 2009 to 2012.

The Children's Social Health Monitor (CSHM) arose from the work of health professionals responding to deteriorating economic conditions in New Zealand and Australia. A working group, comprised of individuals from a range of organisationsⁱⁱⁱ, was formed in 2009 to develop a set of indicators to monitor the impact of economic conditions on children's wellbeing.

Developing the CSHM indicator set

To ensure the indicator set was methodologically robust, and could be consistently monitored over time, the data selected needed to be routinely collected and able to provide complete population coverage. A set of selection criteria were established against which potential indicators were scored. Examples of these criteria included:

- That measures of economic performance and wellbeing were internationally recognised, and likely to change in response to a recession
- That health conditions monitored were likely to be influenced by families' physical adaptations to worsening economic conditions
- That data included were updated at least annually

A long list of potential indicators were assessed against the selection criteria by the working group, and a baseline set of measures were established for the CSHM and these are outlined below:

Economic indicators:

- Gross Domestic Product
- Income inequality
- Child poverty
- Unemployment rates
- The number of children reliant on benefit recipients

Child health and wellbeing indicators:

- Hospitalisations from conditions with a social gradient
- Deaths from conditions with a social gradient
- Infant mortality
- Hospitalisations and deaths from intentional injury

The economic indicators, and a number of the child health and wellbeing indicators, already had established methods of analysis. Methods for assessing hospitalisations and deaths for conditions with a social gradient had to be developed specifically for the Children's Social Health Monitor. A brief description of the process used to develop these measures follows below.

A **social gradient** occurs when hospitalisation or death rates are different for children living in areas with different scores on an NZDep index of deprivation, for example rates of a condition are higher for children living in areas with high deprivation index scores compared with rates for children living in areas with low scores. In developing the indicator the CSHM Working Group critically reviewed conditions where there was a rate ratio of ≥ 1.5 for NZDep deciles 9–10 compared with deciles 1–2; or > 1.8 for Māori, Pacific or Asian compared with European children, and selected conditions that demonstrated a consistent social gradient that was biologically plausible.

ⁱⁱⁱThe 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.

Methods used to develop the hospitalisations and death indicators

Hospitalisations

The 40 most frequent causes of hospital admission in children aged 0–14 years were reviewed, and those exhibiting a social gradient were selected. Hospitalisations for neonatal (infants aged less than 28 days) were excluded on the basis that these admissions are likely to reflect issues arising prior to, or at the time of birth.

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. The inclusion of waiting list admissions would result, for example, in a large number of children 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.

It was not possible to filter injuries by admission type as it was difficult to distinguish between acute and waiting list admissions in the injury admission processes of a number of district health boards. . In this report, all injury cases with an emergency department specialty code on discharge were excluded as a result of inconsistent uploading of emergency department cases across district health boards. This differential filtering means that it is not possible to accurately compare hospitalisations with a social gradient between the medical condition and injury categories.. Differences in how communities use emergency departments versus primary care for minor medical conditions may also have accounted for some of the social gradients seen.

Deaths

In many instances, as the number of deaths from a particular condition was insufficient to calculate reliable rate ratios for socioeconomic categories, the rate ratios derived from the analysis of hospitalisation data were used to denote category membership.

The most frequent causes of death in those aged 0–14 years (excluding neonates) were reviewed to ensure that there were no additional conditions making a large contribution to deaths that had been missed by the method used to analyse the hospitalisation data. This identified two further conditions: death from drowning and Sudden Unexpected Death in Infancy (SUDI), which were then included for both the hospitalisation and death indicators. A number of deaths were also identified which were attributed to issues arising in the perinatal period, extreme prematurity for example, but in order to preserve consistency with exclusion criteria regarding the perinatal period these were not included.

Appendix 2: Statistical significance testing

Inferential statistics are used when a researcher wishes to use a sample to draw conclusions about a larger population as a whole (for example, weighing a class of 10 year old boys, in order to estimate the average weight of all 10 year old boys in New Zealand). The findings obtained from the sample provide an estimate for the population, but will always differ from it to some degree, simply due to chance. Similarly, samples are used when a researcher questions whether the risk of developing a particular condition is different between two groups, and the fit of the estimate obtained from the samples to the actual population needs to be carefully considered. An example of this would be a study examining whether lung cancer is more common in smokers or non-smokers: researchers using sample groups would have to consider the possibility that some of 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. These measures can assign a level of confidence to estimates and conclusions drawn from samples, allowing researchers to assess, for example, whether the average weight of boys in the sample reflects the true weight of all 10 year old boys, or the rates of lung cancer in smokers are really different to those in non-smokers. Two of the most frequently used statistical significance tests are:

P values: The p value from a statistical test measures the probability of finding a difference at least as large as the one observed between groups, if there were no real differences between the groups studied. For example, 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 if the p value is <0.05 ; that is, when the probability of the observed differences occurring by chance is less than 5%.⁵⁰

Confidence Intervals: When sampling from a population a confidence interval is a range of values that contains the measure of interest. While a confidence interval for the average height of ten year old boys could be 20cm to 200cm, for example, the smaller range of 130cm to 150cm is a more informative statistic. 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.⁵⁰

Statistical significance testing in this report

When tests of statistical significance have been applied in a particular section, the statistical significance of the associations presented has been signalled in the text with the words *significant*, or *not significant* in italics. Where the words *significant* or *not significant* do not appear in the text, then the associations described do not imply statistical significance or non-significance.

Several data sources are used in this report. In general they belong to one of two groups: 1) population surveys or 2) routine administrative datasets. The relevant statistical testing for each of these data sources are as follows:

Population surveys: Some of indicators reported on here are derived from data from national surveys 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 included in the text accompanying graphs and tables. In a small number of cases, information on statistical significance was not available, and any associations described do not imply statistical significance.

Numbers derived from routine administrative data: A large number of the indicators included in this report are based on data from New Zealand's administrative datasets, for example the National Mortality Collection, which capture information on all of the events occurring in a particular category.

Rate ratios derived from routine administrative data: To facilitate comparisons between different time periods, and for examining the data from New Zealand in a wider context, whenever measures of association (rate ratios) are presented in this report, 95% confidence intervals have been provided.⁵¹

Appendix 3: Datasets used in the Child Poverty Monitor

The Child Poverty Monitor presents information derived from several national administrative datasets. These are described briefly below, and limitations to be aware of when interpreting results drawn from these sources are outlined.

The National Mortality Collection

The National Mortality Collection is a dataset managed by the Ministry of Health which contains information on the underlying cause, or causes, of death along with basic demographic data for all deaths registered in New Zealand since 1988. Fetal and infant death data are a subset of the Mortality Collection, with cases in this subset having additional information on factors such as birth weight and gestational age.⁵² 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 information from other sources such as Coronial Services, Police, NZ Transport Agency, the NZ Cancer Registry, the Institute of Environmental Science and Research, and Water Safety NZ.⁵³

The National Minimum Dataset

The National Minimum Dataset (NMDS) is national hospital discharge dataset and is maintained by the Ministry of Health. It is used for policy formation, performance monitoring, and research purposes, providing key information about the delivery of hospital inpatient and day patient health services both nationally and on a provider basis. It is also used for funding purposes.⁵⁴

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. Data have been submitted by public hospitals electronically since the original NMDS was implemented in 1993, with additional data dating back to 1988 also included. The private hospital discharge information for publicly funded events has been collected since 1997. The current NMDS was introduced in 1999.⁵⁴

The Birth Registration Dataset

Since 1995 all NZ hospitals and delivering midwives have been required to notify the Department of Internal Affairs within five working days of the birth of a live or stillborn baby. This applies to stillborn babies born at or more than 20 weeks gestation, or those weighing 400g or more; prior to 1995, only stillborn babies reaching more than 28 weeks of gestation required birth notification. Information on the hospital's notification form includes maternal age, ethnicity, multiple birth status, and the baby's sex, birth weight and gestational age. In addition, parents must jointly complete a birth registration form as soon as reasonable practicable after the birth, and within two years of delivery, which duplicates the above information with the exception of birth weight and gestational age. 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.⁴⁰

Dataset limitations

There are limitations when using any of these datasets. The following are of particular relevance to this report.

Clinical coding accuracy and coding changes over time

The quality of data submitted to the administrative national datasets may vary. While the data for the National Mortality Collection and the Birth Registration Dataset are coded by single agencies, the clinical information held in the NMDS is entered by health providers before being collated by the Ministry of Health. In a 2001 review of the quality of coding in the data submitted to the NMDS, 2,708 events were audited over ten sites during a three month period. Overall the audit found that 22% of events required a change in coding, although this also included changes at a detailed level. Changes to the principal diagnosis involved 11% of events, to additional diagnoses 23%, and to procedure coding, 11%. There were 1,625 external causes of injury codes, of which 15% were re-coded differently.⁵⁵ 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, the average 16% error rate indicated by the 2001 review may be an overestimate as, in the majority of the analyses undertaken in this report, only the principal diagnosis is used to describe the reason for admission.

Changes in the coding systems used over time may result in irregularities in time series analyses.⁵³ New Zealand hospitals use the clinical coding classification developed by the World Health Organization and modified by the National Centre for Classification in Health, Australia. The current classification is called The International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification (ICD-10-AM), the Australian Classification of Health Interventions (ACHI) and Australian Coding Standards (ACS). The introduction of ICD-10-AM represented the most significant change in classification in over 50 years, expanding the number of codes from ~5,000 to ~8,000, to provide for recently recognised conditions and allow greater specificity about common diseases.

From 1988 until 1999, clinical information in the NMDS was coded using versions of the ICD-9 classification system. From July 1999 onwards, the ICD-10-AM classification system has been used. Back and forward mapping between the two systems is possible using predefined algorithms,⁵⁶ and for most conditions there is a good correspondence between ICD-9 and ICD-10-AM codes. Care should still

be taken when interpreting time series analyses which include data from both time periods as some conditions may not be directly comparable between the two coding systems.

Variation in reporting hospitalisations to the NMDS

Historically, there have been differences in the way New Zealand's 20 district health boards (DHBs) have reported their emergency department (ED) hospitalisations to the NMDS, which can affect the interpretation of hospitalisation data. Inconsistent recording of ED cases has resulted from differing definitions of the time spent in the ED, and at what point this time constitutes an admission. This is important in paediatrics where hospitalisations for acute onset infectious and respiratory diseases in young children especially are mainly of short duration. In addition, there are regional differences in treatment processes for paediatric emergency cases.

This report includes all ED day cases in its analyses of hospitalisations for medical conditions. This approach differs from that commonly used by the Ministry of Health when analysing NMDS hospital discharge data, which the Ministry of Health uses to minimise the impact of the inconsistent reporting of ED cases. Short stay ED events are often excluded from the Ministry's analyses to improve comparability between regions. However, as noted above, the treatment of children in acute cases differs from that of adults, and the inclusion of ED day cases is justified when considering hospitalisations for medical conditions, despite inconsistencies in the dataset. The Ministry of Health's practice of filtering out ED day cases for hospitalisations for injuries is followed in this report as it is considered that the processes for injury assessments are relatively consistent around the country.

Further information on the details of the inconsistencies can be seen in earlier reports by the NZCYES <http://www.otago.ac.nz/ncyes>

Changes in the way ethnicity information has been recorded over time

Due to inconsistencies in the way ethnicity information was recorded in the health sector, and in census data before 1996, all ethnic group specific analyses in this report are for the year 1996 onwards. See Appendix 4 for a brief review of the changes in the recording of ethnicity information over the past 35 years in New Zealand.

Appendix 4: Ethnicity data

Because of inconsistencies in the manner in which ethnicity information in New Zealand was collected prior to 1996, all ethnic group specific analyses presented in this report are for the 1996 year onwards, and reflect self-identified concepts of ethnicity. Details of the changes made in the census question on ethnicity, and why they were made, can be found on the Statistics New Zealand website <http://www.stats.govt.nz>

This report presents ethnic-specific analyses for 1996 onwards and, unless otherwise specified, prioritised ethnic group has been used to ensure that each health event is only counted once.

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 as the potential still remains for Māori and Pacific children and young people to be undercounted in our national data collections. 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 because previous research has shown that ethnicity misclassification can change over time and ethnic misclassification may vary significantly by district health board.⁵⁷ Adjusters developed using national level data (as in Hauora IV⁵⁸) may not be applicable to district health board level analyses, with separate adjusters needing to be developed for each.

In addition, the development of adjusters requires the linkage of the dataset under review with another dataset for which more reliable ethnicity information is available, and 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 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%.

Appendix 5: The NZDep index of deprivation

The NZ index of deprivation (NZDep) was first created using information from the 1991 census, and has been updated following each census. It is a small area index of deprivation, and is used as a proxy for socioeconomic status. The main concept underpinning small area indices of deprivation is that the socioeconomic environment in which a person lives can confer risks or benefits which may be independent of their own social position within a community.⁵⁹ They are aggregate measures, providing information about the wider socioeconomic environment in which a person lives, rather than information about their individual socioeconomic status.

The latest index, NZDep2013, combines nine variables from the 2013 census to reflect eight dimensions of material and social deprivation (**Table 15**). Each variable represents a standardised proportion of people living in an area who lack a defined material or social resource. These are combined to give a score representing the average degree of deprivation experienced by people in that area. Individual area scores are ranked and placed on an ordinal scale from 1 to 10, with decile 1 reflecting the least deprived 10% of small areas and decile 10 reflecting the most deprived 10% of small areas⁶⁰.

The advantage of the NZDep is its ability to assign measures of socioeconomic status to the older population, the unemployed and to children, to whom income and occupational measures often don't apply, as well as to provide proxy measures of socioeconomic status for large datasets when other demographic information is lacking. Small area indices have limitations, however, as not all individuals in a particular area are accurately represented by their area's aggregate score. While this may be less of a problem for very affluent or very deprived neighbourhoods, in average areas, aggregate measures may be much less predictive of individual socioeconomic status.⁵⁹ Despite these limitations, the NZDep has been shown to be predictive of mortality and morbidity from a number of diseases in New Zealand.

Table 15. Variables used in the NZDep2013

Dimension	Variable in order of decreasing weight in the index
Communication	People aged <65 with no access to the Internet at home
Income	People aged 18–64 receiving a means tested benefit
Income	People living in equivalised* households with income below an income threshold
Employment	People aged 18–64 unemployed
Qualifications	People aged 18–64 without any qualifications
Owned home	People not living in own home
Support	People aged <65 living in a single parent family
Living space	People living in equivalised* households below a bedroom occupancy threshold
Transport	People with no access to a car

*The setting of the household equivalised income threshold was based on two principles: 1) the proportion of the population identified as being socioeconomically deprived by the threshold should be broadly consistent with the other variables in the index, and 2) the threshold should be broadly consistent with other measures of income poverty.⁶⁰

Appendix 6: Measures of material hardship

This appendix outlines the main New Zealand data sources that include non-income measures (NIMs) and are used to assist in monitoring material hardship or material wellbeing. **Table 16** is from Perry (2015)³ and provides a brief overview of the deprivation and material wellbeing indices used in his report and in other Ministry of Social Development (MSD) research.

Table 16. National and international deprivation and material wellbeing indices

Index	Description	Data sources
EU-9	A 9 item material deprivation index used officially by the EU.	LSS 2008
EU-13	A 13 item material deprivation index likely to be formally adopted by the EU to replace EU-9.	LSS 2008 HES 2015–16 and later
DEP-17	A 17 item deprivation index developed and used by MSD (sometimes referred to as “MSD’s material deprivation index”).	LSS 2008 HES 2012–13 and later
ELSI ELSI-SF	ELSI is MSD’s prototype full-spectrum index using 40 NIMs to cover the range from low to high material living standards. The short-form (SF) version uses 25 items. The ELSI has been replaced by the MWI.	LSS 2000, 2004 and 2008 HES 2006–07 to 2011–12 have ELSI-SF items GSS 2008, 2010 and 2012 have ELSI-SF items
MWI MWI-9	MSD’s Material Wellbeing Index (MWI) is a 24 item index covering the full spectrum of material wellbeing from low to high. It was developed as a ‘mark 2 ELSI’, incorporating what was learnt from using the prototype. The short-form version has 9 items.	LSS 2008 HES 2012–13 and later GSS 2014 (MWI-9 only)
NZiDep	NZiDep is an 8 item deprivation index developed by Wellington School of Medicine researchers.	SoFIE (and the 2006–07 NZ Health Survey)
NZDep	See Appendix 5.	Census

Non-income measures for material hardship

Three types of NIMs are of particular relevance to the Child Poverty Monitor: general household items (for example being able to keep the house warm); individual adult respondent items (for example having a set of clothes for important or special occasions); and child-specific items (for example: owning two sets of warm winter clothes for each child, having a separate bed for each child).

The NIMs used in New Zealand have been revised by MSD in recent years. Work has been undertaken to develop NIMs in line with indices such as the EU-SILC series that has been used in Europe since 2005, and HILDA which ran in Australia from 2001–2009. This change means, however, that the material hardship measures reported in the Child Poverty Monitor from the inaugural report of 2013 have been adjusted as the percentage of children living in material hardship in 2013 has been recalculated in the 2015 MSD report.³

The following are the sources of current non-income measures reported in New Zealand.

- The Living Standards Surveys (LSS), undertaken nationally by MSD (2004 and 2008) provide data on households with children and child specific measures. The 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.² The details of the 2008 Survey are available from earlier MSD reports.²⁵
- Statistics NZ conducts the Household Economic Survey (NZHES) that has included a range of non-income measures since 2006–07. For much of this time it has contained items for the Economic Living Standards Index (ELSI) that ranks households from low to high living standards using a range of non-income measures. The original ELSI had 40 items but the ‘short’, 25-item version has been used in these analyses and the threshold for material hardship was considered to be 6 out of 16 specific items.³ A revised set of 29 items has been used from 2012–13 on.
- The Material Wellbeing Index (MWI) was developed more recently by Ministry of Social Development. It uses 13 of the 25 items from ELSI and adds 11 new ones (**Table 17**).³ First used in the 2012–13 report on material hardship, its items come from the ‘enforced lack’ perspective and also from the ‘freedoms enjoyed’ perspective. There is considerable similarity on the household rankings between ELSI and MWI although the latter has greater emphasis on material things that households or families have and activities they could participate in. For example, it focuses on housing quality (the ability to keep it warm rather than the number of bathrooms) and being able to pay the electricity bill or replace broken appliances rather than whether they own white ware.³ The MWI is better than ELSI for identifying changes in material wellbeing over time and it is also seen as being a reasonable proxy for the new DEP-17 (see below). An MWI short form (9 items) was used in the General Social Survey in 2014 (**Table 18**).³

- DEP-17 is a 17 item deprivation index based on the 2008 Living standards Survey (LSS). It focuses on the lower 20-30% of material wellbeing. It has been developed in conjunction with the MWI and provides a simpler index of material hardship than indices with a composite score. The range of items included provides differing degrees of hardship which allows for finer nuances within material hardship and how it is experienced by different people.
- Statistics New Zealand's longitudinal Survey of Family, Income and Employment (SoFIE) has an 8 item set of the general household and adult respondent types.

Table 17. Non-income items in the Household Economic Survey from 2012-13 and scoring for MWI and DEP-17

Item description	MWI	DEP-17
Ownership or participation (have/do, don't have/do and enforced lack (EL)) <i>For DEP-17, score an EL as 1, otherwise 0; For MWI, score an EL as a 0, otherwise 1</i>		
1 Two pairs of shoes in a good condition and suitable for daily activities	✓	✓
2 Suitable clothes for important or special occasions	✓	✓
3 Contents insurance	✓	✓
4 A meal with meat, fish or chicken (or vegetarian equivalent) at least each 2nd day	✓	✓
5 A good bed	✓	-
6 Presents for family/friends on special occasions	✓	✓
7 Holiday away from home at least once every year	✓	-
8 Overseas holiday at least once every three years	✓	-
Economising (not at all, a little, a lot) – to keep down costs to help in paying for (other) basic items		
9 Gone without or cut back on fresh fruit and vegetables	✓	✓
10 Buy cheaper cuts of meat or bought less meat than you would like	✓	✓
11 Continued wearing worn out clothes	✓	-
12 Put up with feeling cold	✓	✓
13 Do without or cut back on trips to the shops or other local places	✓	✓
14 Delay replacing or repairing broken or damaged appliances	✓	✓
15 Spent less on hobbies or other special interests than you would like	✓	-
16 Postponed visits to the doctor	✓	✓
17 Postponed visits to the dentist	✓	✓
Housing problems (no problem, minor problem, major problem)		
18 Dampness or mould	✓	-
19 Heating or keeping it warm in winter	✓	-
Freedoms/Restrictions		
20 When buying, or thinking about buying, clothes or shoes for yourself, how much do you usually feel limited by the money available? (4 point response from 'not limited ... very limited'). <i>For DEP-17, score 'very limited' as 1, otherwise 0; For MWI, score as 3, 2, 1 and 0 respectively.</i>	✓	✓
21 \$300 spot purchase for an 'extra' – how restricted? (5 point response from 'not restricted ... couldn't purchase') <i>For MWI, score as 4, 3, 2, 1 and 0 respectively.</i>	✓	-
22 \$500 unexpected unavoidable expense on an essential – can you pay in a month without borrowing? (yes/no) <i>For DEP-17, score no' as 1, and 'yes' as 0; For MWI, score 'yes' as 2 and 'no' as 0</i>	✓	✓
Financial strain (in last 12 months) (not at all, once, more than once)		
23 Behind on rates or utilities	✓	✓
24 Behind on car registration, wof or insurance	✓	✓
25 Behind on rent or mortgage	-	-
26 Borrowed from family or friends to meet everyday living costs	-	✓
27 Received help in the form of food, clothes or money from a welfare or community organisation such as a church or food bank	-	-
Global self-ratings		
28 Adequacy of income to cover basics of accommodation, food, clothing, etc	-	-
29 Satisfaction with life	-	-

Perry 2015³

The Perry 2015 report³ uses DEP-17 thresholds in the range of 6+ to 11+ out of 17 to examine the characteristics of households with low living standards". This is working on a spectrum from less to more severe hardship. A score of 9+ is considered to indicate "households experiencing unacceptably low living standards". This approach does not provide a simple percentage or number of those in hardship. For further detail on the methodology used see Perry B. (2015) *The material wellbeing of New Zealand households: trends and relativities using non-income measures, with international comparisons*. 2015, Ministry of Social Development: Wellington.³

Table 18. The MWI short form used in the General Social Survey 2014 has nine items

Enforced lacks

- Two pair shoes for daily activities (R)
- Suitable clothes for special occasions (R)
- Presents for families/friends (R)
- Home contents insurance (H)
- Holiday away from home for at least a week each year (R)

Economising "a lot" to keep costs down so as able to afford other basic items

- Go without fresh fruit and vegetables (H)
 - Continue wearing worn out clothing (R)
 - Postpone or put off visits to the doctor (R)
 - Do without or cut back on trips to the shops or other local places (H)
- (R = for respondent, and H = for household as a whole)

Additional items in the survey include:

- 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

Appendix 7: ICD-10-AM codes

Medical conditions with a social gradient (primary diagnosis)

Acute bronchiolitis	J21
Acute lower respiratory infection unspecified	J22
Acute upper respiratory infections	J00–J03 or J06
Asthma and wheeze	J45–J46, R062
Bronchiectasis	J47
Croup, laryngitis, tracheitis, epiglottitis	J04
Dermatitis and eczema	L20–L30
Epilepsy or status epilepticus	G40 or G41
Febrile convulsions	R56.0
Gastroenteritis	A00–A09, R11, K529
Inguinal hernia	K40
Meningitis: bacterial	G00–G01
Meningitis: viral, other, NOS	A87, G02 or G03
Meningococcal disease	A39
Nutritional deficiencies or anaemias	E40–E64 or D50–D53
Osteomyelitis	M86
Otitis media	H65, H66 or H67
Pneumonia: bacterial, non-viral, unspecified	J13–J16 or J18
Pneumonia: viral	J12, J10.0 or J11.0
Rheumatic fever and rheumatic heart disease	I00–I09
Skin infections	L00–L08, H00.0, H01.0, J34.0 or L98.0
Tuberculosis	A15–A19
Urinary tract infection	N10, N12, N13.6, N30.0, N30.9 or N39.0
Vaccine preventable diseases	A33, A34, A35, A36, A37, A80, B05, B06, B16, B26, B18.0, B18.1, P35.0 or M01.4
Viral infection of unspecified site	B34

Injury S00–T79

Injuries with a social gradient (external cause code)

Falls	W00–W19
Mechanical forces: animate	W50–W64
Mechanical forces: inanimate	W20–W49
Poisoning	X40–X49
Thermal injury	W85–X19
Transport: cyclist	V10–V19
Transport: pedestrian	V01–V09
Transport: vehicle occupant	V40–V79
Other	
Assault	X85–Y09
Emergency Department specialty code	M05–M08

Infant mortality and SUDI (underlying cause of death)

Congenital anomalies	Q00–Q99
Extreme prematurity	P07.2
Injury or poisoning	V01–Y36
Intrauterine hypoxia or birth asphyxia	P20, P21
Other perinatal conditions	P00–P19; P22–P96
SUDI	
SUDI: inhalation of gastric contents or food	W78, W79
SUDI: SIDS	R95
SUDI: suffocation or strangulation in bed	W75
SUDI: unspecified	R96, R98, R99

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