

HOSPITAL ADMISSIONS AND MORTALITY WITH A SOCIAL GRADIENT IN CHILDREN

In New Zealand, there are currently large disparities in child health status, with Māori and Pacific children and those living in more deprived areas experiencing a disproportionate burden of morbidity and mortality [1]. These disparities were present even in the mid 2000s, when New Zealand experienced some of its lowest unemployment rates in recent decades. The macroeconomic environment began to change in 2008 however, with the country officially entering a recession at the end of June 2008, after two consecutive quarters of negative growth. While New Zealand technically left the recession at the end of June 2009 (when quarterly growth reached +0.1% [2]), progress since then has been variable, with unemployment rates, and the number of children reliant on benefit recipients remaining higher than in the mid-2000s.

The impact these changes might have on socially sensitive health outcomes remains unclear however, as international evidence suggests that the effects may vary, not only with the magnitude and duration of any economic downturn, but also as a result of the Government's social policy responses, and the extent to which New Zealand can maintain an effective social safety net (e.g. in housing, health, education, income support) for those most affected. Further, the adaptations families make to their economic circumstances (e.g. cutting back on heating and doctor's visits vs. reductions in cigarettes and takeaways), are also important, with the net impact of such positive / negative adaptations on health outcomes for children being difficult to predict (for a more detailed review of these issues see [3]).

As predicting the impact of the economic downturn on child wellbeing is difficult, it would instead seem prudent to monitor a basket of key child health outcomes over time, in order to ensure that any impacts on child health and wellbeing can be identified early, and so that proactive and co-ordinated responses can be put in place, should the need arise. The following section thus uses data from the National Minimum Dataset and the National Mortality collection to review hospital admissions for, and mortality from, the basket of socially sensitive conditions outlined in the Methods section below.

Data Source and Methods

Definition

1. Hospital Admissions for Medical Conditions with a Social Gradient in Children Aged 0–14 Years
2. Injury Admissions with a Social Gradient in Children Aged 0–14 Years
3. Mortality with a Social Gradient in Children Aged 0–14 Years

Data Source

For details of the methodology used to derive these indicators see **Appendix 6**.

Numerator:

Hospital Admissions for Medical Conditions with a Social Gradient: Acute and Arranged (Arranged= within 7 days of referral) Hospital Admissions (Waiting List, ACC Cases and neonates <29 days excluded) in children aged 0–14 years with the following ICD-10-AM primary diagnoses: A00–A09, R11, K529 (Gastroenteritis); A15–A19 (Tuberculosis); A33, A34, A35, A36, A37, A80, B05, B06, B16, B26, B18.0, B18.1, P35.0 or M01.4 (Vaccine Preventable Diseases); A39 (Meningococcal Disease); B34 (Viral Infection of Unspecified Site); E40–E64 or D50–D53 (Nutritional Deficiencies / Anaemias); J00–J03 or J06 (Acute Upper Respiratory Infections); J04 (Croup/Laryngitis/Tracheitis/Epiglottitis); J12, J10.0 or J11.0 (Viral Pneumonia); J13–J16 or J18 (Bacterial / Non-Viral Pneumonia); J21 (Acute Bronchiolitis); J45–J46 (Asthma); J47 (Bronchiectasis); G00–G01 (Bacterial Meningitis); A87, G02 or G03 (Viral / Other / NOS Meningitis); G40 or G41 (Epilepsy/ Status Epilepticus); H65, H66 or H67 (Otitis Media); I00–I09 (Rheumatic Fever/Heart Disease); K40 (Inguinal Hernia); L00–L08, H00.0, H01.0, J34.0 or L98.0 (Skin Infections); L20–L30 (Dermatitis and Eczema); M86 (Osteomyelitis); N10, N12, N13.6, N30.0, N30.9 or N39.0 (Urinary Tract Infection); R56.0 (Febrile Convulsions).

Injury Admissions with a Social Gradient: Hospital admissions (emergency department cases, neonates <29 days excluded) in children 0–14 years, with a primary diagnosis of injury (ICD-10-AM S00–T79) and an ICD-10-AM primary external cause code in the following range: V01–V09 (Transport: Pedestrian); V10–V19 (Transport: Cyclist); V40–V79 (Transport: Vehicle Occupant); W00–W19 (Falls); W20–W49 (Mechanical Forces: Inanimate); W50–W64 (Mechanical Forces: Animate); W85–X19 (Electricity / Fire / Burns); X40–X49 (Accidental Poisoning); In order to ensure comparability over time, all injury cases with an Emergency Department Specialty Code (M05–M08) on discharge were excluded.



Mortality with a Social Gradient. All deaths in children 0–14 years, (neonates <29 days excluded) with a main underlying cause of death in the ICD-10-AM medical and injury categories outlined above. In addition post-neonatal Sudden Unexpected Deaths in Infancy (SUDI) were included, if the child was aged between 29 days and 1 year and their main underlying cause of death was SUDI (ICD-10-AM R95, R96, R98, R99, W75).

Denominator: NZ Statistics NZ Estimated Resident Population

Indicator Category Proxy B–C

Notes on Interpretation (for further detail see **Appendix 6**)

Note 1: Hospital admissions in neonates (<29 days) were excluded from both indicators, as these admissions are more likely to reflect issues arising prior to / at the time of birth, (e.g. preterm infants may register multiple admissions as they transition from intensive care (NICU), through special care nurseries (SCBU) to the postnatal ward), and respiratory infections / other medical conditions arising in these contexts are likely to differ in their aetiology from those arising in the community.

Note 2: For medical conditions, only acute and arranged admissions have been included, as Waiting List admissions tend to reflect service capacity, rather than actual health need (e.g. inclusion of these admissions would result in a large number of children with otitis media with effusion (OME) and chronic tonsillitis being included (for grommets and tonsillectomies), whose demographic profile is very different from children attending hospital acutely for similar diseases). For injury admissions however, filtering by admission type could not occur, as a number of DHBs admitted injury cases under (now discontinued) ACC admission codes, making it difficult to distinguish between acute and waiting list admissions in this context. As with other injury data in these reports however, all injury cases with an Emergency Department Specialty Code (M05–M08) on discharge were excluded (see **Appendix 2** for rationale).

Note 3: Hospital admissions were considered to have a social gradient if rates for those in the most deprived (NZDep Decile 9–10) areas were ≥ 1.8 times higher than for those in the least deprived (NZDep Decile 1–2) areas, or where rates for Māori, Pacific or Asian children were ≥ 1.8 times higher than for European children. In addition, a small number of conditions were included where rates were ≥ 1.5 times higher, they demonstrated a consistent social gradient, and the association was biologically plausible.

Note 4: When considering the magnitude of social gradients between medical and injury admissions, it must be remembered that these differences are not strictly comparable, as for technical reasons emergency department cases have been removed from injury admissions (and social differences in attendance at the Emergency Department vs. primary care for minor medical conditions may have accounted for some (but not all) of the social gradients in medical admission seen). No such differential filtering occurred for mortality data however, and thus the magnitude of the social differences seen is more readily comparable.

Note 5: 95% confidence intervals have been provided for the rate ratios in this section and where appropriate, the terms *significant* or *not significant* have been used to communicate the significance of the observed associations. Tests of statistical significance have not been applied to other data in this section, and thus (unless the terms *significant* or *non-significant* are specifically used) the associations described do not imply statistical significance or non-significance (see **Appendix 1** for further discussion of this issue).

Note 6: SUDI rates are traditionally calculated per 1,000 live births. For this analysis rates for those aged 0–14 years have been calculated, so that the relative contribution SUDI makes to mortality in this age group (as compared to other causes of death) is more readily appreciated. As a result, the SUDI rates in this section are not readily comparable to traditional SUDI mortality rates for those <1 year reported elsewhere.

Note 7: The rates presented here may differ from those reported previously due to a change in the codes used to identify gastroenteritis. Prior to 2008, a large proportion of gastroenteritis cases were coded to A09 (diarrhoea and gastroenteritis of presumed infectious origin). From 2008 however, the MoH (as the result of a move from ICD-10-AM Version 3 to 6) began to map the majority of these cases to K529 (non-infective gastroenteritis and colitis unspecified). As the original CSHM hospital admissions indicator was developed using 2003–2007 data, because K529 only accounted for a minority of cases at that point, and because the majority of gastroenteritis cases in the paediatric population are presumed to be of infectious origin, the K529 code was not initially included in the CSHM coding algorithms. The coding change however resulted in a large reduction in the number A09 coded cases and a large increase in the number of K529 coded cases after 2008. Thus, in order to preserve time series continuity (even though the clinical appropriateness of such a coding change remains debatable) the current year's analysis includes both the A09 and K529 gastroenteritis codes (with this coding change being extended back to 2000). As a result, the results presented here may be higher than those presented previously, with the greatest impact on rates being seen after 2008.

New Zealand Distribution and Trends

Distribution by Cause

Hospital Admissions: In New Zealand during 2006–2010, gastroenteritis, bronchiolitis, and asthma made the largest individual contributions to hospitalisations for medical conditions with a social gradient, although infectious and respiratory diseases collectively were responsible for the majority of admissions. Similarly falls, followed by inanimate mechanical forces were the leading causes of injury admissions with a social gradient, although transport accidents as a group also made a significant contribution (**Table 1**).



Table 1. Hospital Admissions for Conditions with a Social Gradient in Children Aged 0–14 Years (excluding Neonates) by Cause, New Zealand 2006–2010

| Primary Diagnosis | Number: Total 2006–2010 | Number: Annual Average | Rate per 1,000 | % of Total |
|---|-------------------------|------------------------|----------------|--------------|
| Medical Conditions | | | | |
| Gastroenteritis | 26,610 | 5,322.0 | 5.96 | 14.9 |
| Acute Bronchiolitis | 26,228 | 5,245.6 | 5.88 | 14.7 |
| Asthma | 24,030 | 4,806.0 | 5.38 | 13.5 |
| Acute Upper Respiratory Infections Excl Croup | 18,890 | 3,778.0 | 4.23 | 10.6 |
| Viral Infection of Unspecified Site | 17,635 | 3,527.0 | 3.95 | 9.89 |
| Skin Infections | 15,198 | 3,039.6 | 3.40 | 8.52 |
| Bacterial/Non-Viral Pneumonia | 14,900 | 2,980.0 | 3.34 | 8.35 |
| Urinary Tract Infection | 6,647 | 1,329.4 | 1.49 | 3.73 |
| Croup/Laryngitis/Tracheitis/Epiglottitis | 5,752 | 1,150.4 | 1.29 | 3.23 |
| Epilepsy/Status Epilepticus | 3,982 | 796.4 | 0.89 | 2.23 |
| Febrile Convulsions | 3,555 | 711.0 | 0.80 | 1.99 |
| Otitis Media | 3,483 | 696.6 | 0.78 | 1.95 |
| Dermatitis and Eczema | 3,136 | 627.2 | 0.70 | 1.76 |
| Viral Pneumonia | 1,925 | 385.0 | 0.43 | 1.08 |
| Inguinal Hernia | 1,427 | 285.4 | 0.32 | 0.80 |
| Osteomyelitis | 1,169 | 233.8 | 0.26 | 0.66 |
| Rheumatic Fever/Heart Disease | 914 | 182.8 | 0.20 | 0.51 |
| Viral/Other/NOS Meningitis | 722 | 144.4 | 0.16 | 0.40 |
| Bronchiectasis | 702 | 140.4 | 0.16 | 0.39 |
| Meningococcal Disease | 449 | 89.8 | 0.10 | 0.25 |
| Vaccine Preventable Diseases | 410 | 82.0 | 0.09 | 0.23 |
| Nutritional Deficiencies/Anaemias | 299 | 59.8 | 0.07 | 0.17 |
| Bacterial Meningitis | 221 | 44.2 | 0.05 | 0.12 |
| Tuberculosis | 59 | 11.8 | 0.01 | 0.03 |
| New Zealand Total | 178,343 | 35,668.6 | 40.0 | 100.0 |
| Injury Admissions | | | | |
| Falls | 24,511 | 4,902.2 | 5.49 | 49.1 |
| Mechanical Forces: Inanimate | 12,712 | 2,542.4 | 2.85 | 25.5 |
| Transport: Cyclist | 2,926 | 585.2 | 0.66 | 5.87 |
| Mechanical Forces: Animate | 2,807 | 561.4 | 0.63 | 5.63 |
| Accidental Poisoning | 2,632 | 526.4 | 0.59 | 5.28 |
| Electricity/Fire/Burns | 1,959 | 391.8 | 0.44 | 3.93 |
| Transport: Vehicle Occupant | 1,179 | 235.8 | 0.26 | 2.36 |
| Transport: Pedestrian | 974 | 194.8 | 0.22 | 1.95 |
| Drowning/Submersion | 175 | 35.0 | 0.04 | 0.35 |
| New Zealand Total | 49,875 | 9,975.0 | 11.2 | 100.0 |

Source: Numerator: National Minimum Dataset (Neonates removed); Denominator: Statistics NZ Estimated Resident Population. Note: Medical Conditions: Acute and Arranged Admissions only; Injury Admissions: Emergency Department cases removed.



Mortality: In New Zealand during 2004–2008, SUDI made the single largest contribution to mortality with a social gradient in children aged 0–14 years. This occurred despite the fact that, by definition, all of these deaths occurred during the first year of life. Vehicle occupant related deaths made the largest contribution to injury related deaths, followed by pedestrian injuries and drowning, while bacterial / non viral pneumonia was the leading cause of mortality from medical conditions (**Table 2**).

Table 2. Mortality from Conditions with a Social Gradient in Children Aged 0–14 Years (excluding Neonates) by Cause, New Zealand 2004–2008

| Diagnosis | Number: Total 2004–2008 | Number: Annual Average | Rate per 100,000 | % of Total |
|---|-------------------------|------------------------|------------------|------------|
| Medical Conditions | | | | |
| Bacterial/Non-Viral Pneumonia | 49 | 9.8 | 1.10 | 32.5 |
| Epilepsy/Status Epilepticus | 19 | 3.8 | 0.43 | 12.6 |
| Meningococcal Disease | 18 | 3.6 | 0.41 | 11.9 |
| Viral Pneumonia | 14 | 2.8 | 0.32 | 9.3 |
| Bacterial Meningitis | 12 | 2.4 | 0.27 | 7.9 |
| Asthma | 9 | 1.8 | 0.20 | 6.0 |
| Gastroenteritis | 7 | 1.4 | 0.16 | 4.6 |
| Acute Bronchiolitis | 5 | 1.0 | 0.11 | 3.3 |
| Acute Upper Respiratory Infections Excl Croup | 3 | 0.6 | 0.07 | 2.0 |
| Viral/Other/NOS Meningitis | 3 | 0.6 | 0.07 | 2.0 |
| Other Causes | 12 | 2.4 | 0.27 | 7.9 |
| Total Medical Conditions | 151 | 30.2 | 3.40 | 100.0 |
| Injuries | | | | |
| Transport: Vehicle Occupant | 87 | 17.4 | 1.96 | 36.0 |
| Transport: Pedestrian | 46 | 9.2 | 1.04 | 19.0 |
| Drowning/Submersion | 44 | 8.8 | 0.99 | 18.2 |
| Electricity/Fire/Burns | 21 | 4.2 | 0.47 | 8.7 |
| Transport: Cyclist | 12 | 2.4 | 0.27 | 5.0 |
| Mechanical Forces: Inanimate | 12 | 2.4 | 0.27 | 5.0 |
| Falls | 11 | 2.2 | 0.25 | 4.5 |
| Accidental Poisoning | 7 | 1.4 | 0.16 | 2.9 |
| Other Causes | <3 | s | s | s |
| Total Injuries | 242 | 48.4 | 5.45 | 100.0 |
| Post Neonatal SUDI | | | | |
| SUDI (Infant) | 266 | 53.2 | 5.99 | 100.0 |
| New Zealand | 659 | 131.8 | 14.84 | 100.0 |

Source: Numerator: National Mortality Collection (Neonates removed); Denominator: Statistics NZ Estimated Resident Population. Note: SUDI death numerators are for infants aged 29–364 days only.

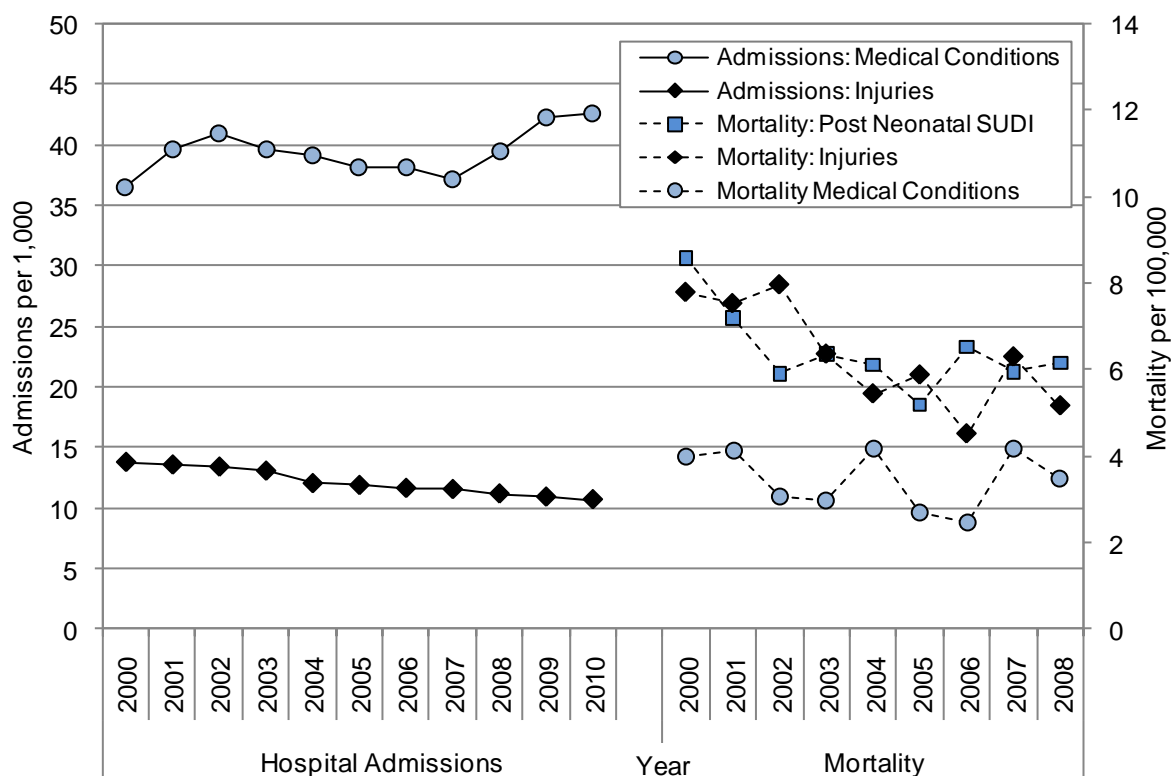
New Zealand Trends

Hospital Admissions: In New Zealand, medical admissions with a social gradient increased during the early 2000s, reached peak in 2002 and then declined, with an upswing in rates again being evident during 2007–2009. In contrast, injury admissions with a social gradient declined throughout 2000–2010 (**Figure 1**).

Mortality: In New Zealand, injury mortality with a social gradient decreased between 2000 and 2004, but fluctuated thereafter. Similarly, post-neonatal SUDI decreased between 2000 and 2002 and thereafter remained relatively static, while mortality from medical conditions with a social gradient fluctuated throughout 2000–2008 (**Figure 1**).



Figure 1. Hospital Admissions (2000–2010) and Mortality (2000–2008) from Conditions with a Social Gradient in New Zealand Children Aged 0–14 Years (excluding Neonates)



Source: Numerator Admissions: National Minimum Dataset (Neonates removed); Numerator Mortality: National Mortality Collection (Neonates Removed); Denominator: Statistics NZ Estimated Resident Population. Note: Medical Conditions Admissions: Acute and Arranged Admissions only; Injury Admissions: Emergency Department Cases removed.

Trends by Ethnicity

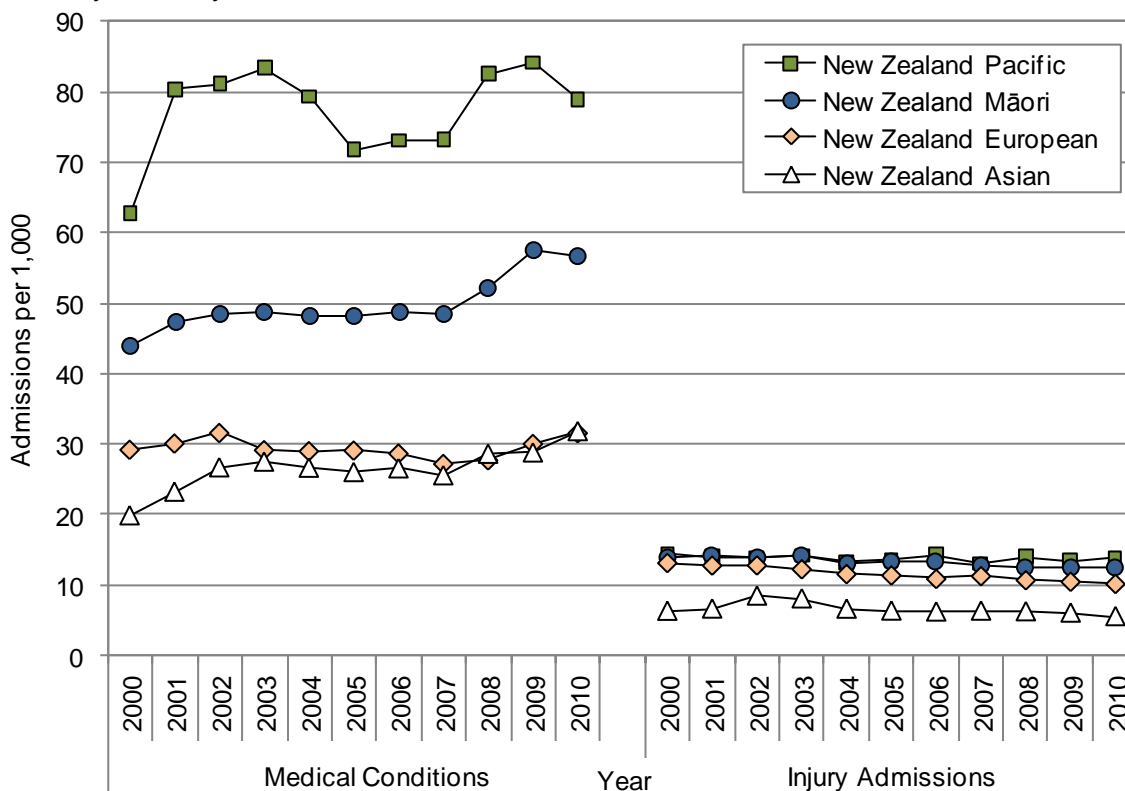
Hospital Admissions for Medical Conditions: In New Zealand during 2000–2010, hospitalisations for medical conditions with a social gradient were consistently higher for Pacific > Māori > European and Asian children. For Pacific children, admissions increased during the early 2000s, reached a peak in 2003 and then declined. An upswing in rates was again evident during 2007–2009, with rates then declining during 2010. For Māori children, rates were static during the mid 2000s, but then increased between 2007 and 2009, while for Asian and European children rates were static during the mid-2000s but increased after 2007 (**Figure 2**).

Hospital Admissions for Injuries: In New Zealand during 2000–2010, injury admissions with a social gradient were also higher for Pacific and Māori > European > Asian children. Admission rates for European and Māori children declined during 2000–2010, while rates for Pacific and Asian children were more static, with ethnic differences being greater in 2010 than they were in 2000. While in absolute terms, the magnitude the ethnic differences seen appeared to be less marked than for medical conditions, for technical reasons, comparisons between these categories is not strictly possible (see Note 4 in Methods section) (**Figure 2**).

Mortality: In New Zealand during 2000–2008, SUDI mortality was consistently higher for Māori > Pacific > European and Asian infants, while mortality from medical conditions with a social gradient was generally higher for Māori and Pacific > European and Asian children. While mortality from injuries with a social gradient was also consistently higher for Māori than for European and Asian children, rates for Pacific children were more variable (**Figure 3**).

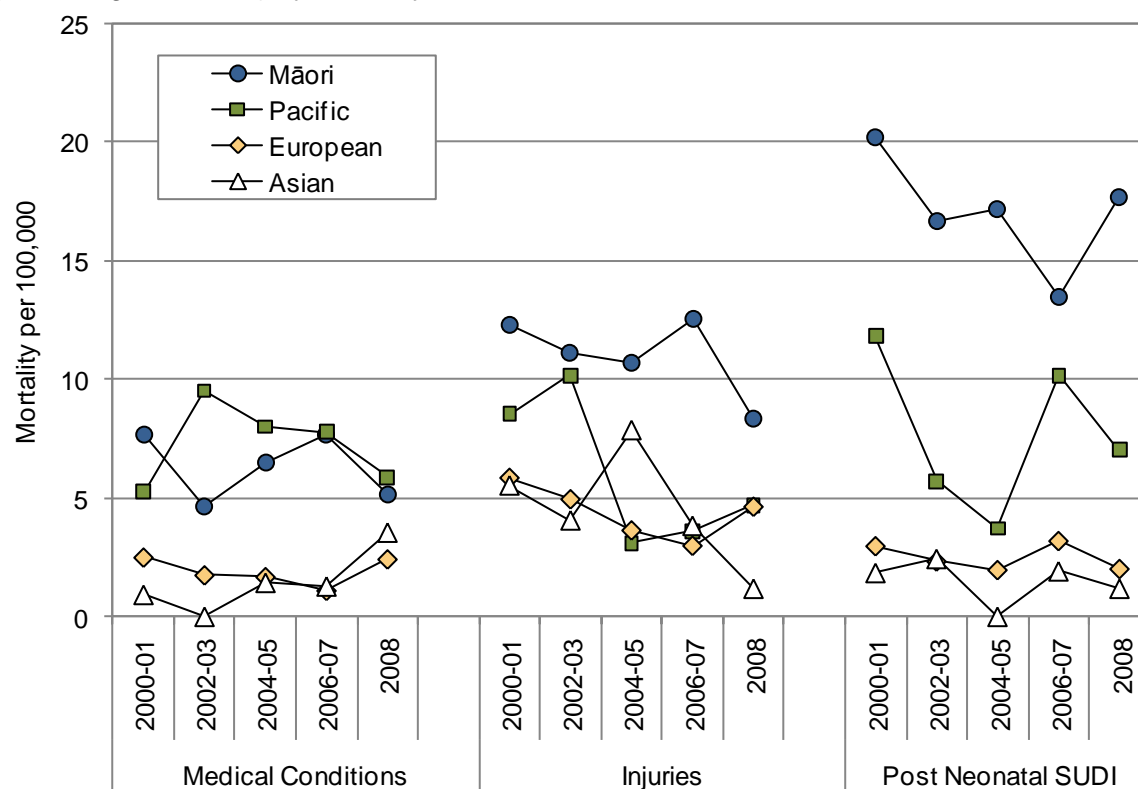


Figure 2. Hospital Admissions for Conditions with a Social Gradient in Children Aged 0–14 Years by Ethnicity, New Zealand 2000–2010



Source: Numerator: National Minimum Dataset (Neonates removed); Denominator: Statistics NZ Estimated Resident Population. Note: Medical Conditions: Acute and Arranged Admissions only; Injury Admissions: Emergency Department Cases removed. Ethnicity is Level 1 Prioritised.

Figure 3. Mortality from Conditions with a Social Gradient in Children Aged 0–14 Years (excluding Neonates) by Ethnicity, New Zealand 2000–2008



Source: Numerator: National Mortality Collection (Neonates removed); Denominator: Statistics NZ Estimated Resident Population. Note: SUDI deaths are for infants aged 29–364 days only. Ethnicity is Level 1 Prioritised.



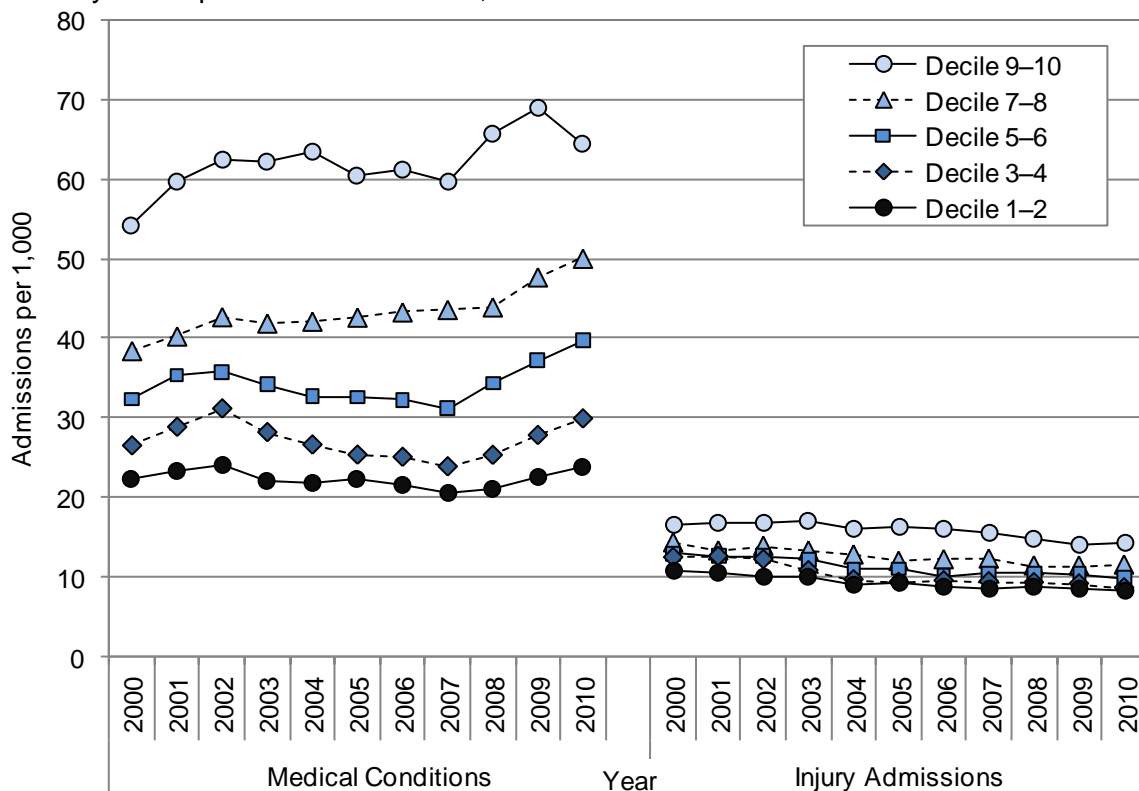
Trends by NZ Deprivation Index Decile

Hospital Admissions for Medical Conditions: In New Zealand during 2000–2010, hospital admissions for medical conditions with a social gradient were consistently higher for those living in Decile 9–10 > Decile 7–8 > Decile 5–6 > Decile 3–4 > Decile 1–2 areas. While admissions for those in Decile 1–7 areas increased during 2008–2010, admissions for those in Decile 9–10 areas declined after 2009.

Hospital Admissions for Injuries: In New Zealand during 2000–2010, injury admissions with a social gradient were also consistently higher for those living in Decile 9–10 > Decile 7–8 > Decile 5–6 > Decile 3–4 > Decile 1–2 areas, although rates gradually declined for all socioeconomic groups during this period. While in absolute terms the socioeconomic differences seen were less marked than for medical conditions, for technical reasons comparisons between these admission categories is not strictly possible (see Note 4 in Methods section) (**Figure 4**).

Mortality: In New Zealand during 2000–2008, medical conditions and injuries with a social gradient, and post neonatal SUDI were all consistently higher for those in the most deprived (Decile 9–10) areas than for those in the least deprived (Decile 1–2) areas, with the greatest absolute differences being evident for post neonatal SUDI (**Figure 5**).

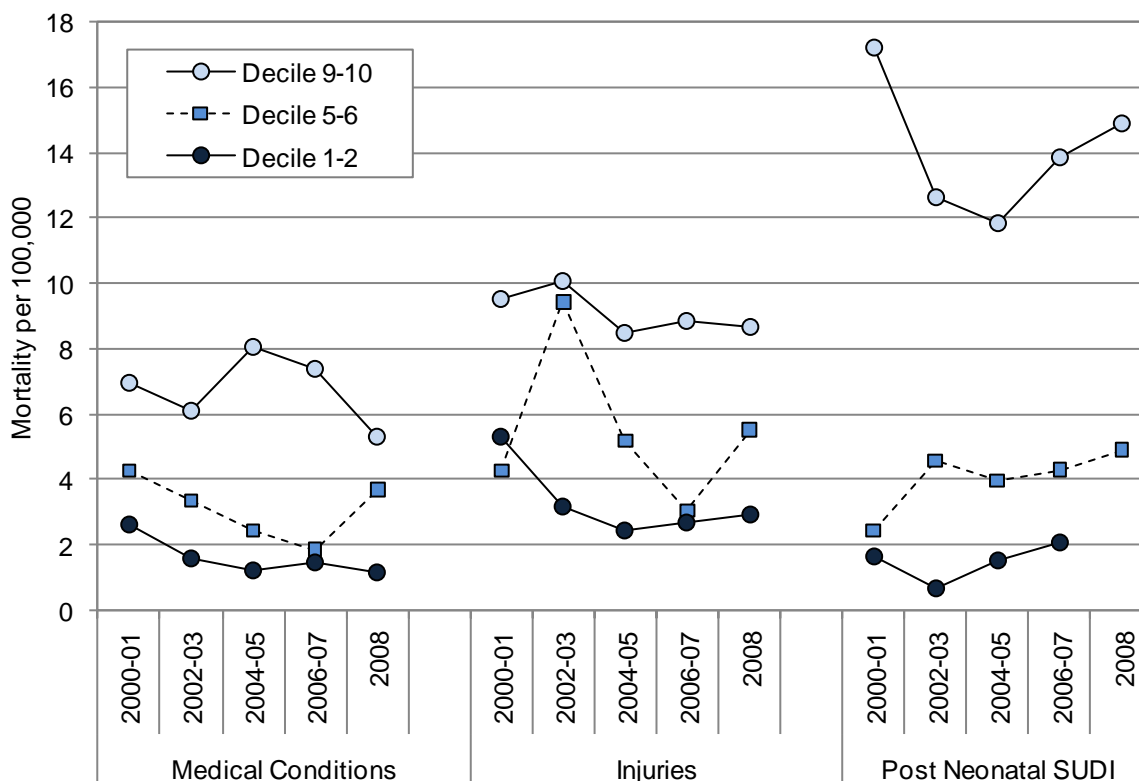
Figure 4. Hospital Admissions for Conditions with a Social Gradient in Children Aged 0–14 Years by NZ Deprivation Index Decile, New Zealand 2000–2010



Source: Numerator: National Minimum Dataset (Neonates removed); Denominator: Statistics NZ Estimated Resident Population. Note: Medical Conditions: Acute and Arranged Admissions only; Injury Admissions: Emergency Department Cases removed.



Figure 5. Mortality from Conditions with a Social Gradient in Children Aged 0–14 Years (excluding Neonates) by NZ Deprivation Index Decile, New Zealand 2000–2008



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

Distribution by Ethnicity, Gender and NZDep Deprivation

Hospital Admission for Medical Conditions: In New Zealand during 2006–2010, hospital admissions for medical conditions with a social gradient were *significantly* higher for Pacific > Māori > European and Asian children, males and those in average–more deprived (NZDep decile 3–10) areas (**Table 3**).

Hospital Admission for Injuries: Similarly during 2006–2010, hospital admissions for injury admissions with a social gradient were *significantly* higher for Pacific > Māori > European > Asian children, males and those in average–more deprived (NZDep decile 4–10) areas. While the magnitude of these social differences appeared smaller for injury admissions, it must be remembered that that for technical reasons (See Note 4 in Methods Section) these categories are not strictly comparable (**Table 3**).

Mortality: In New Zealand during 2004–2008, mortality from medical conditions with a social gradient was *significantly* higher for Pacific and Māori > European and Asian children, and those in more deprived (Decile 7–10) areas. Similarly mortality from injuries with a social gradient was *significantly* higher for Māori > Asian, Pacific and European children, males and those in more deprived (Deciles 3–4 and 7–10) areas (**Table 4**). Differences in SUDI mortality are considered in the Infant Mortality section.



Table 3. Risk Factors for Hospital Admissions with a Social Gradient in Children Aged 0–14 Years, New Zealand 2006–2010

| Medical Conditions | | | | | | | |
|-----------------------------|------|------|-----------|-------------------------------|------|------|-----------|
| Variable | Rate | RR | 95% CI | Variable | Rate | RR | 95% CI |
| NZ Deprivation Index Decile | | | | NZ Deprivation Index Quintile | | | |
| Decile 1 | 22.2 | 1.00 | | Decile 1–2 | 21.9 | 1.00 | |
| Decile 2 | 21.6 | 0.97 | 0.95–1.00 | Decile 3–4 | 26.4 | 1.21 | 1.18–1.23 |
| Decile 3 | 25.1 | 1.13 | 1.10–1.16 | Decile 5–6 | 34.9 | 1.60 | 1.57–1.63 |
| Decile 4 | 27.5 | 1.24 | 1.21–1.28 | Decile 7–8 | 45.7 | 2.09 | 2.05–2.12 |
| Decile 5 | 32.6 | 1.47 | 1.43–1.51 | Decile 9–10 | 64.0 | 2.92 | 2.88–2.97 |
| Decile 6 | 36.9 | 1.66 | 1.62–1.71 | Ethnicity | | | |
| Decile 7 | 41.3 | 1.86 | 1.82–1.91 | Asian | 28.4 | 0.98 | 0.96–1.00 |
| Decile 8 | 49.5 | 2.23 | 2.18–2.29 | European | 29.1 | 1.00 | |
| Decile 9 | 59.4 | 2.68 | 2.62–2.74 | Māori | 52.8 | 1.82 | 1.80–1.84 |
| Decile 10 | 67.9 | 3.06 | 3.00–3.13 | Pacific | 78.4 | 2.70 | 2.67–2.73 |
| Gender | | | | | | | |
| Female | 36.0 | 1.00 | | Male | 43.8 | 1.22 | 1.21–1.23 |
| Injuries | | | | | | | |
| Variable | Rate | RR | 95% CI | Variable | Rate | RR | 95% CI |
| NZ Deprivation Index Decile | | | | NZ Deprivation Index Quintile | | | |
| Decile 1 | 8.7 | 1.00 | | Decile 1–2 | 8.5 | 1.00 | |
| Decile 2 | 8.3 | 0.94 | 0.90–0.99 | Decile 3–4 | 9.1 | 1.07 | 1.04–1.11 |
| Decile 3 | 8.9 | 1.01 | 0.97–1.06 | Decile 5–6 | 10.2 | 1.20 | 1.16–1.24 |
| Decile 4 | 9.4 | 1.07 | 1.02–1.12 | Decile 7–8 | 11.7 | 1.37 | 1.33–1.41 |
| Decile 5 | 10.2 | 1.17 | 1.12–1.22 | Decile 9–10 | 15.0 | 1.76 | 1.71–1.81 |
| Decile 6 | 10.2 | 1.17 | 1.12–1.22 | Ethnicity | | | |
| Decile 7 | 11.1 | 1.27 | 1.22–1.33 | Asian | 6.0 | 0.56 | 0.54–0.58 |
| Decile 8 | 12.2 | 1.39 | 1.34–1.45 | European | 10.7 | 1.00 | |
| Decile 9 | 14.9 | 1.70 | 1.64–1.77 | Māori | 12.7 | 1.18 | 1.15–1.20 |
| Decile 10 | 15.1 | 1.72 | 1.66–1.79 | Pacific | 13.7 | 1.28 | 1.24–1.31 |
| Gender | | | | | | | |
| Female | 8.9 | 1.00 | | Male | 13.3 | 1.49 | 1.47–1.52 |

Source: Numerator: National Minimum Dataset (Neonates removed); Denominator: Statistics NZ Estimated Resident Population. Note: Medical Conditions: Acute and Arranged Admissions only; Injury Admissions: Emergency Department Cases removed; Rates are per 1,000; Rate Ratios are unadjusted; Ethnicity is Level 1 Prioritised.



Table 4. Risk Factors for Mortality with a Social Gradient in Children Aged 0–14 Years, New Zealand 2004–2008

| Medical Conditions | | | | | | | |
|------------------------------------|------|------|------------|-----------------------|-------|------|-----------|
| Variable | Rate | RR | 95% CI | Variable | Rate | RR | 95% CI |
| NZ Deprivation Index Decile | | | | Prioritised Ethnicity | | | |
| Decile 1–2 | 1.32 | 1.00 | | Asian | 1.83 | 1.15 | 0.52–2.57 |
| Decile 3–4 | 1.57 | 1.20 | 0.54–2.67 | European | 1.59 | 1.00 | |
| Decile 5–6 | 2.44 | 1.85 | 0.89–3.87 | Māori | 6.69 | 4.22 | 2.86–6.21 |
| Decile 7–8 | 3.30 | 2.51 | 1.26–5.00 | Pacific | 7.47 | 4.71 | 2.95–7.53 |
| Decile 9–10 | 7.23 | 5.49 | 2.92–10.34 | Gender | | | |
| | | | | Female | 2.86 | 1.00 | |
| | | | | Male | 3.91 | 1.37 | 0.99–1.89 |
| Injuries | | | | | | | |
| Variable | Rate | RR | 95% CI | Variable | Rate | RR | 95% CI |
| NZ Deprivation Index Decile | | | | Prioritised Ethnicity | | | |
| Decile 1–2 | 2.63 | 1.00 | | Asian | 4.70 | 1.32 | 0.79–2.19 |
| Decile 3–4 | 4.85 | 1.84 | 1.09–3.10 | European | 3.57 | 1.00 | |
| Decile 5–6 | 4.40 | 1.67 | 0.98–2.84 | Māori | 10.96 | 3.07 | 2.33–4.04 |
| Decile 7–8 | 5.28 | 2.00 | 1.21–3.32 | Pacific | 3.61 | 1.01 | 0.59–1.75 |
| Decile 9–10 | 8.66 | 3.29 | 2.06–5.24 | Gender | | | |
| | | | | Female | 4.34 | 1.00 | |
| | | | | Male | 6.51 | 1.50 | 1.16–1.94 |
| SUDI: See Infant Mortality Section | | | | | | | |

Source: Numerator: National Mortality Collection; Denominator Statistics NZ Estimated Resident Population. Note: Rates are per 100,000; Rate Ratios are unadjusted; Ethnicity is Level 1 Prioritised.



Summary

In New Zealand during 2006–2010, gastroenteritis, bronchiolitis, and asthma made the largest individual contributions to hospitalisations for medical conditions with a social gradient, although infectious and respiratory diseases collectively were responsible for the majority of admissions. Falls, followed by inanimate mechanical forces were the leading causes of injury admissions with a social gradient, although transport accidents as a group also made a significant contribution. Similarly, during 2004–2008 SUDI made the single largest contribution to mortality with a social gradient. Vehicle occupant related deaths, followed by pedestrian injuries and drowning, made the largest contribution to injury related deaths, while bacterial / non viral pneumonia was the leading cause of mortality from medical conditions.

In terms of trends, medical admissions with a social gradient increased during the early 2000s, reached peak in 2002 and then declined, with an upswing in rates again being evident during 2007–2009. In contrast, injury admissions with a social gradient declined throughout 2000–2010. During this period, hospitalisations for medical conditions with a social gradient were consistently higher for Pacific > Māori > European and Asian children. For Pacific children, admissions increased during the early 2000s, reached a peak in 2003 and then declined. An upswing in rates was again evident during 2007–2009, with rates then declining during 2010. For Māori children, rates were static during the mid 2000s, but then increased during 2007-2009, while for Asian and European children rates were static during the mid-2000s but increased after 2007. Injury admissions with a social gradient were also higher for Pacific and Māori > European > Asian children. Admission rates for European and Māori children declined during 2000–2010, while rates for Pacific and Asian children were more static, with ethnic differences being greater in 2010 than they were in 2000.

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