

HEALTH OUTCOMES AS DETERMINANTS



SOCIOECONOMICALLY SENSITIVE HOSPITAL ADMISSIONS AND MORTALITY



HOSPITAL ADMISSIONS AND MORTALITY WITH A SOCIAL GRADIENT IN CHILDREN

Introduction

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 [128]. 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% [129]) 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 effects of these economic changes on socially sensitive health outcomes for children remain unclear. Research suggests that the impacts may vary, not only with the magnitude and duration of any economic downturn, but also as a result of the Government's social policy responses and the extent to which it maintains an effective social safety net for those most affected. Further, the adaptations families make to their economic circumstances (e.g. cutting back on heating and doctors visits vs. reductions in cigarettes and takeaways) are also important, with the net impact of such positive/negative adaptations on health outcomes for children being difficult to predict. For a more detailed review see Craig 2009 [130].

Given this uncertainty, it would seem prudent to monitor a basket of socioeconomically sensitive conditions in children during the next few years, so that if any adverse effects do occur, they can be detected early and proactive policy responses can be put in place should the need arise. With these issues in mind, the following section uses the National Minimum Dataset and Mortality Collection to review hospital admissions and mortality from a basket of socioeconomically sensitive conditions commonly seen in children 0–14 years.

Data Source and Methods

Definition

1. Hospital admissions for medical conditions with a social gradient in children aged 0–14 years
2. Hospital admissions for injuries with a social gradient in children aged 0–14 years
3. Mortality from conditions with a social gradient in children aged 0–14 years

Data Source

Numerator:

Hospital Admissions for Medical Conditions with a Social Gradient: Acute and arranged (arranged = within 7 days of referral) hospital admissions (waiting list cases and neonates <29 days excluded) with the following ICD-10-AM primary diagnoses: A00–A09, R11, K52.9 (Gastroenteritis); A15–A19 (Tuberculosis); A33, A34, A35, A36, A37, A80, B05, B06, B16, B26, B18.0, B18.1, P35.0 or M01.4 (Vaccine Preventable Diseases); A39 (Meningococcal Disease); B34 (Viral Infection of Unspecified Site); E40–E64 or D50–D53 (Nutritional Deficiencies/Anaemias); J00–J03 or J06 (Acute Upper Respiratory Infections); J04 (Croup/Laryngitis/Tracheitis/Epiglottitis); J12, J10.0 or J11.0 (Viral Pneumonia); J13–J16 or J18 (Bacterial/Non-Viral Pneumonia); J21 (Acute Bronchiolitis); J45–J46 (Asthma); J47 (Bronchiectasis); G00–G01 (Bacterial Meningitis); A87, G02 or G03 (Viral/Other/NOS Meningitis); G40 or G41 (Epilepsy/Status Epilepticus); H65, H66 or H67 (Otitis Media); I00–I09 (Rheumatic Fever/Heart Disease); K40 (Inguinal Hernia); L00–L08, H00.0, H01.0, J34.0 or L98.0 (Skin Infections); L20–L30 (Dermatitis and Eczema); M86 (Osteomyelitis); N10, N12, N13.6, N30.0, N30.9 or N39.0 (Urinary Tract Infection); R56.0 (Febrile Convulsions).

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



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

Denominator:

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

Notes on Interpretation

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

Note 2: Hospital admissions in neonates (<29 days) were excluded from both indicators. These admissions are more likely to reflect issues arising prior to/at the time of birth (e.g. preterm infants may register multiple admissions as they transition from intensive care (NICU), through special care nurseries (SCBU) to the postnatal ward) and respiratory infections and/or other medical conditions arising in these contexts are likely to differ in their aetiology from those arising in the community.

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

Note 4: Hospital admissions were considered to have a social gradient if rates for those in the most deprived (NZDep deciles 9–10) areas were ≥ 1.8 times higher than for those in the least deprived (NZDep deciles 1–2) areas, or where rates for Māori, Pacific or Asian/Indian children were ≥ 1.8 times higher than for European children. In addition, a small number of conditions were included where rates were ≥ 1.5 times higher, they demonstrated a consistent social gradient, and the association was biologically plausible.

Note 5: When considering the magnitude of social gradients between medical and injury admissions it must be remembered that these differences are not strictly comparable, as for technical reasons, emergency department cases have been removed from injury admissions (and social differences in attendance at the Emergency Department vs. primary care for minor medical conditions may have accounted for some (but not all) of the social gradients in medical admission seen). No such differential filtering was applied to mortality data however, and thus the magnitude of the social differences seen in mortality data is more readily comparable.

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

For details of the methodology used to derive these indicators see **Appendix 9**

New Zealand Distribution and Trends

New Zealand Distribution by Cause

Hospital Admissions: In New Zealand during 2007–2011, 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 injuries as a group also made a significant contribution (**Table 48**).

Mortality: In New Zealand during 2005–2009, 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 49**).

Table 48. Hospital Admissions for Conditions with a Social Gradient in Children Aged 0–14 Years (Excluding Neonates) by Primary Diagnosis, New Zealand 2007–2011

Primary Diagnosis	New Zealand			
	Number: Total 2007–2011	Number: Annual Average	Rate per 1,000	% of Total
Medical Conditions				
Acute Bronchiolitis	27,420	5,484.0	6.13	15.1
Gastroenteritis	26,230	5,246.0	5.86	14.4
Asthma	24,003	4,800.6	5.36	13.2
Acute Upper Respiratory Infections Excl Croup	19,580	3,916.0	4.38	10.8
Viral Infection of Unspecified Site	19,050	3,810.0	4.26	10.5
Skin Infections	15,926	3,185.2	3.56	8.7
Pneumonia: Bacterial, Non-Viral	14,606	2,921.2	3.26	8.0
Urinary Tract Infection	6,918	1,383.6	1.55	3.8
Croup/Laryngitis/Tracheitis/Epiglottitis	5,686	1,137.2	1.27	3.1
Epilepsy/Status Epilepticus	4,070	814.0	0.91	2.2
Febrile Convulsions	3,514	702.8	0.79	1.9
Dermatitis and Eczema	3,317	663.4	0.74	1.8
Otitis Media	3,258	651.6	0.73	1.8
Pneumonia: Viral	1,997	399.4	0.45	1.1
Inguinal Hernia	1,332	266.4	0.30	0.7
Osteomyelitis	1,175	235.0	0.26	0.6
Rheumatic Fever/Heart Disease	963	192.6	0.22	0.5
Meningitis: Viral, Other, NOS	765	153.0	0.17	0.4
Bronchiectasis	706	141.2	0.16	0.4
Vaccine Preventable Diseases	534	106.8	0.12	0.3
Meningococcal Disease	433	86.6	0.10	0.2
Nutritional Deficiencies/Anaemias	292	58.4	0.07	0.2
Meningitis: Bacterial	214	42.8	0.05	0.1
Tuberculosis	55	11.0	0.01	<0.1
New Zealand Total	182,044	36,408.8	40.68	100.0
Injury Admissions				
Falls	23,935	4,787.0	5.35	49.2
Mechanical Forces: Inanimate	12,543	2,508.6	2.80	25.8
Mechanical Forces: Animate	2,873	574.6	0.64	5.9
Transport: Cyclist	2,716	543.2	0.61	5.6
Accidental Poisoning	2,417	483.4	0.54	5.0
Electricity/Fire/Burns	2,018	403.6	0.45	4.1
Transport: Vehicle Occupant	1,056	211.2	0.24	2.2
Transport: Pedestrian	918	183.6	0.21	1.9
Drowning/Submersion	174	34.8	0.04	0.4
New Zealand Total	48,650	9,730.0	10.87	100.0

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



Table 49. Mortality from Conditions with a Social Gradient in Children Aged 0–14 Years (Excluding Neonates) by Main Underlying Cause of Death, New Zealand 2005–2009

Cause of Death	Number: Total 2005–2009	Number: Annual Average	Rate per 100,000	Percent of Category
Medical Conditions				
Pneumonia: Bacterial, Non-Viral	39	7.8	0.88	28.1
Epilepsy/Status Epilepticus	19	3.8	0.43	13.7
Meningococcal Disease	17	3.4	0.38	12.2
Pneumonia: Viral	13	2.6	0.29	9.4
Asthma	12	2.4	0.27	8.6
Gastroenteritis	10	2.0	0.22	7.2
Meningitis: Bacterial	9	1.8	0.20	6.5
Acute Bronchiolitis	5	1.0	0.11	3.6
Bronchiectasis	3	0.6	0.07	2.2
Other Conditions	12	2.4	0.27	8.6
Total Medical Conditions	139	27.8	3.12	100.0
Injuries				
Transport: Vehicle Occupant	91	18.2	2.05	37.6
Transport: Pedestrian	45	9.0	1.01	18.6
Drowning/Submersion	41	8.2	0.92	16.9
Electricity/Fire/Burns	21	4.2	0.47	8.7
Transport: Cyclist	12	2.4	0.27	5.0
Mechanical Forces: Inanimate and Animate	13	2.6	0.29	5.4
Falls	11	2.2	0.25	4.5
Accidental Poisoning	8	1.6	0.18	3.3
Total Injuries	242	48.4	5.44	100.0
Post Neonatal SUDI				
Post Neonatal SUDI	270	54.0	6.07	100.0
Total Mortality New Zealand	651	130.2	14.63	100.0

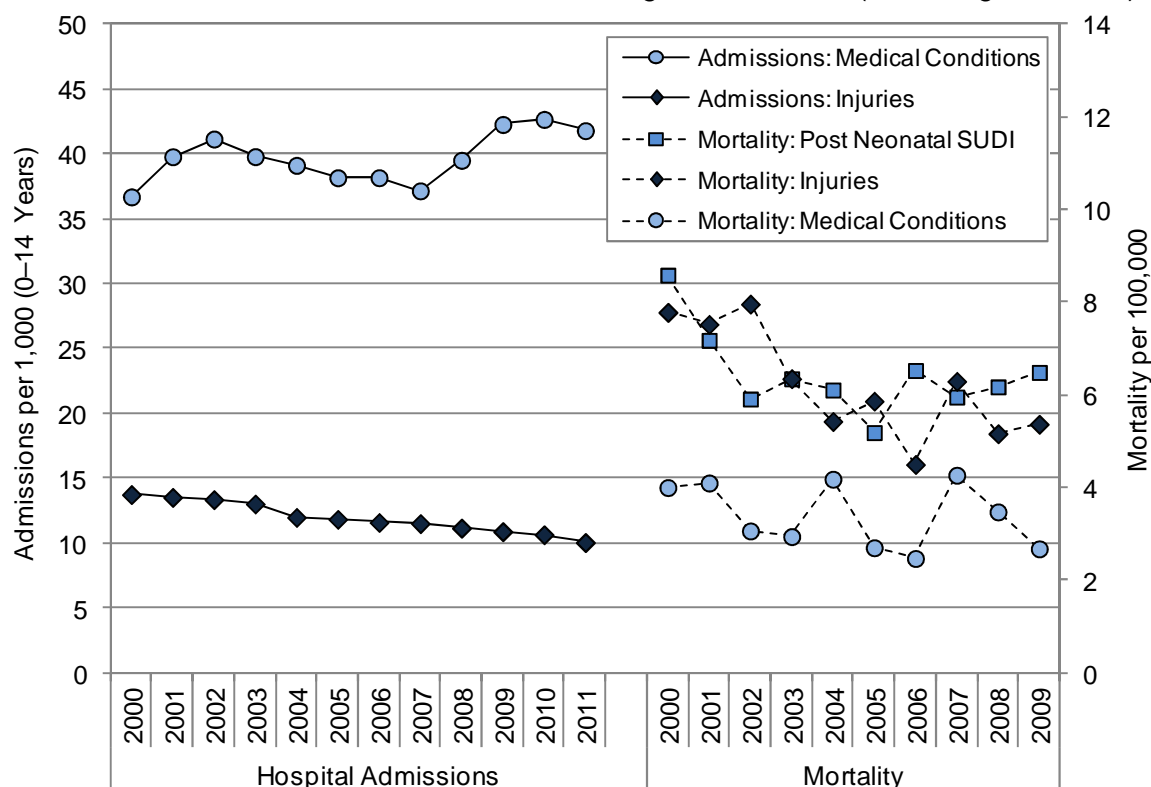
Source: Numerator: National Mortality Collection (neonates removed); Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: SUDI death numerators are for infants aged 29–364 days only

New Zealand Trends

Hospital Admissions: In New Zealand, medical admissions with a social gradient increased during the early 2000s, reached a 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 2000–2011 (**Figure 104**).

Mortality: In New Zealand, mortality from injuries 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 2000–2009 (**Figure 104**).

Figure 104. Hospital Admissions (2000–2011) and Mortality (2000–2009) 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 (projected from 2007) Note: *Admissions: Medical Conditions*: Acute and arranged admissions only; *Admissions: Injuries*: Emergency Department cases removed

New Zealand Trends by Ethnicity

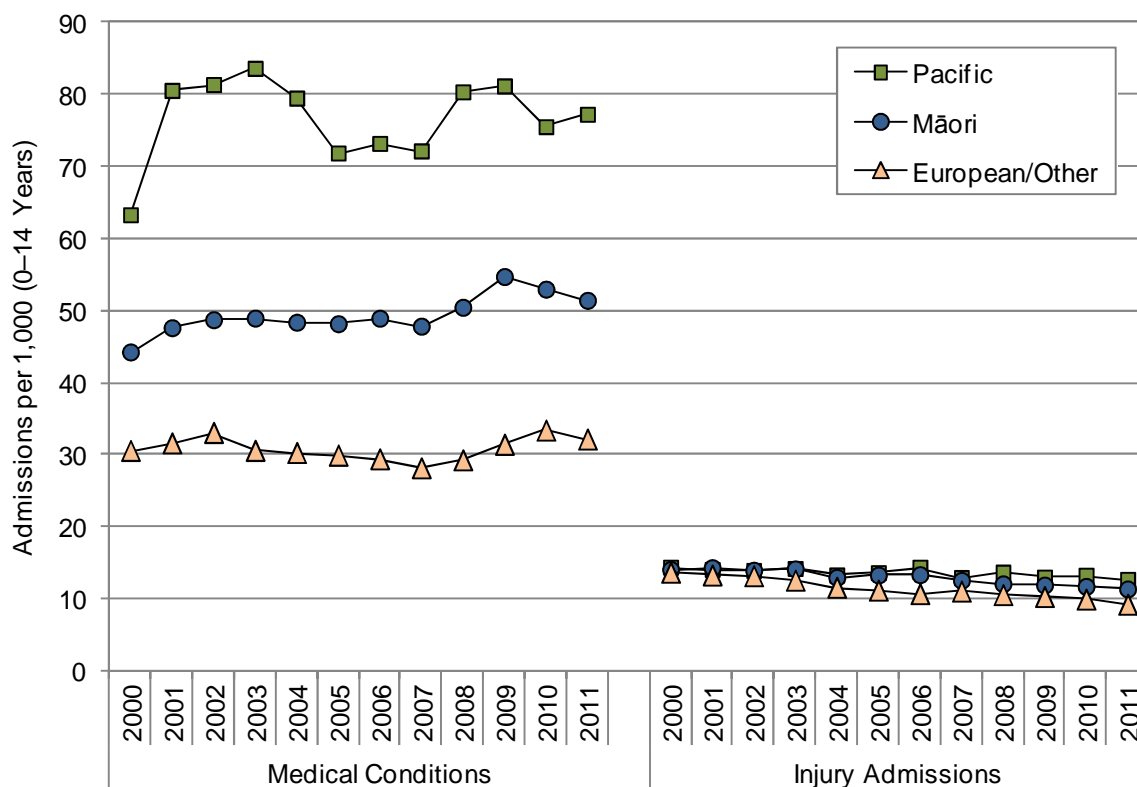
Hospital Admissions for Medical Conditions: In New Zealand during 2000–2011, hospitalisations for medical conditions with a social gradient were consistently higher for Pacific, than for Māori, than for European/Other children. For Pacific children, admissions increased during the early 2000s, reached a peak in 2003 and then declined. An upswing in rates was again evident during 2007–2009, with rates then declining again during 2010. For Māori children, rates were static during the mid 2000s, but then increased between 2007 and 2009 before declining again, while for European/Other children rates were static during the mid 2000s but increased during 2007–2010 (**Figure 105**).

Hospital Admissions for Injuries: In New Zealand during 2000–2011, injury admissions with a social gradient were also higher for Pacific and Māori children than for European/Other children. While admission rates declined for all ethnic groups during 2000–2011, the rate of decline was faster for European/Other, followed by Māori children. Thus ethnic differences were greater in 2011 than they were in 2000. While in absolute terms, the magnitude the ethnic differences seen appeared to be less marked than for medical conditions, for technical reasons, comparisons between these categories is not strictly possible (see Note 4 in Methods section) (**Figure 105**).

Mortality: In New Zealand during 2000–2009, SUDI mortality was consistently higher for Māori, than for Pacific, than for European/Other infants, while mortality from medical conditions with a social gradient was generally higher for Māori and Pacific children than for European/Other children. Mortality from injuries with a social gradient was also consistently higher for Māori than for European/Other children, while rates for Pacific children were more variable (**Figure 106**).

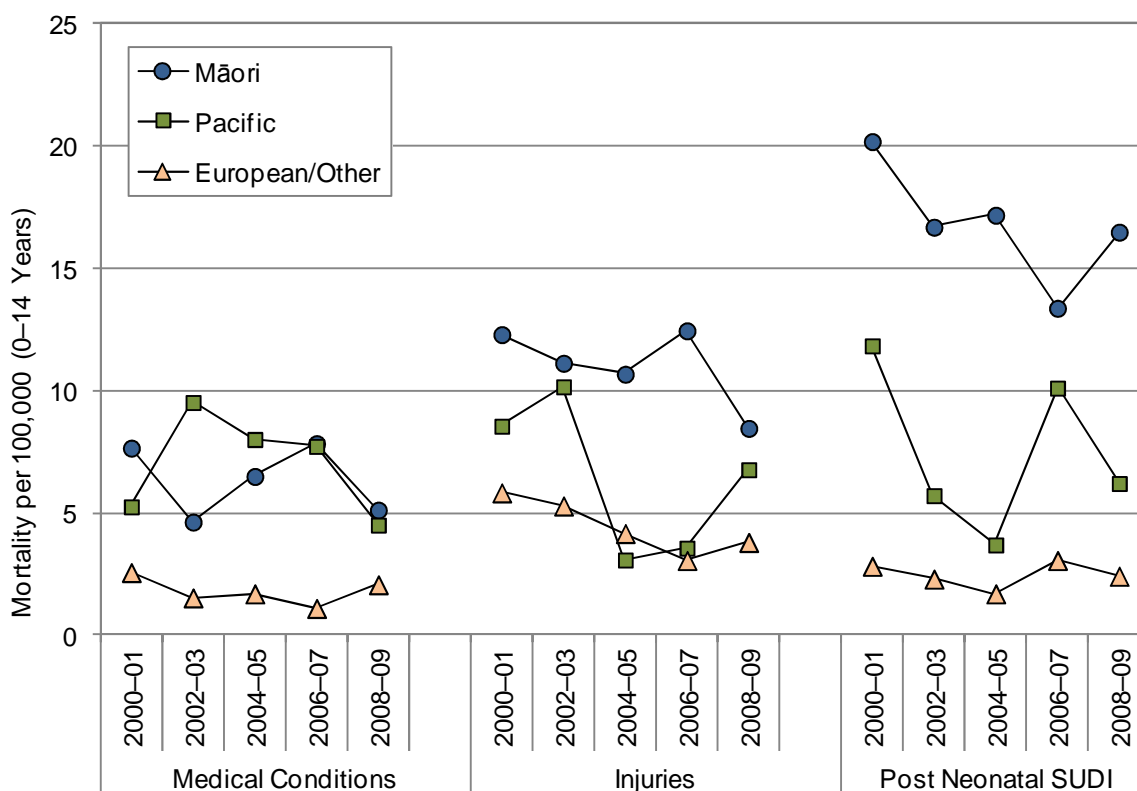


Figure 105. Hospital Admissions for Conditions with a Social Gradient in Children Aged 0–14 Years (Excluding Neonates) by Ethnicity, New Zealand 2000–2011



Source: Numerator: National Minimum Dataset (neonates removed); Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: *Medical Conditions*: Acute and arranged admissions only; *Injury Admissions*: Emergency Department cases removed; Ethnicity is Level 1 Prioritised

Figure 106. Mortality from Conditions with a Social Gradient in Children Aged 0–14 Years (Excluding Neonates) by Ethnicity, New Zealand 2000–2009



Source: Numerator: National Mortality Collection (neonates removed); Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: SUDI deaths are for infants aged 29–364 days only; Ethnicity is Level 1 Prioritised

New Zealand Distribution by Ethnicity and Gender

Hospital Admission for Medical Conditions: In New Zealand during 2007–2011, hospital admissions for medical conditions with a social gradient were *significantly* higher for Pacific > Māori > European/Other children and were also *significantly* higher for males (**Table 50**).

Hospital Admission for Injuries: Similarly during 2007–2011, hospital admissions for injuries with a social gradient were *significantly* higher for Pacific children, than for Māori children, than for European/Other children and were also *significantly* higher for males. 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 50**).

Table 50. Distribution of Hospital Admissions with a Social Gradient in Children Aged 0–14 Years (Excluding Neonates) by Ethnicity and Gender, New Zealand 2007–2011

Hospital Admissions in Children 0–14 Years							
Medical Conditions							
Variable	Rate	Rate Ratio	95% CI	Variable	Rate	Rate Ratio	95% CI
European/Other	30.81	1.00		Female	36.71	1.00	
Māori	51.44	1.67	1.65–1.69	Male	44.47	1.21	1.20–1.22
Pacific	77.23	2.51	2.48–2.54				
Injuries							
Variable	Rate	Rate Ratio	95% CI	Variable	Rate	Rate Ratio	95% CI
European/Other	10.16	1.00		Female	8.75	1.00	
Māori	11.84	1.17	1.14–1.19	Male	12.89	1.47	1.45–1.50
Pacific	13.04	1.28	1.25–1.32				

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

Mortality: In New Zealand during 2005–2009, mortality from medical conditions with a social gradient was *significantly* higher for Pacific and Māori children than for European/Other children. Mortality from injuries with a social gradient was *significantly* higher for Māori children than for European/Other children and for males (**Table 51**). Differences in SUDI mortality are considered in the Infant Mortality section.

Table 51. Distribution of Mortality with a Social Gradient in Children Aged 0–14 Years by Ethnicity and Gender, New Zealand 2005–2009

Mortality in Children 0–14 Years							
Medical Conditions							
Variable	Rate	Rate Ratio	95% CI	Variable	Rate	Rate Ratio	95% CI
European/Other	1.54	1.00		Female	2.44	1.00	
Māori	6.10	3.96	2.71–5.78	Male	3.77	1.54	1.10–2.17
Pacific	6.32	4.10	2.55–6.61				
Injuries							
Variable	Rate	Rate Ratio	95% CI	Variable	Rate	Rate Ratio	95% CI
European/Other	3.76	1.00		Female	4.33	1.00	
Māori	10.10	2.68	2.06–3.49	Male	6.49	1.50	1.16–1.94
Pacific	4.91	1.31	0.82–2.08				

Source: Numerator: National Mortality Collection (neonates removed); Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: Rates are per 100,000; Rate Ratios are unadjusted; Ethnicity is Level 1 Prioritised



South Island Distribution and Trends

South Island vs. New Zealand

Hospital Admissions: In all of the South Island DHBs during 2007–2011, hospital admissions for medical conditions with a social gradient were *significantly* lower than the New Zealand rate. While admissions for injuries with a social gradient were also *significantly* lower than the New Zealand rate in Nelson Marlborough and Otago, rates in the other South Island DHBs were similar to the New Zealand rate (**Table 52**).

Table 52. Hospital Admissions for Conditions with a Social Gradient in Children Aged 0–14 Years (Excluding Neonates), South Island DHBs vs. New Zealand 2007–2011

DHB/Area	Number: Total 2007–2011	Number: Annual Average	Rate per 1,000	Rate Ratio	95% CI
Medical Conditions					
Nelson Marlborough	3,388	678	25.97	0.64	0.62–0.66
South Canterbury	1,158	232	22.39	0.55	0.52–0.58
Canterbury	15,190	3,038	31.49	0.77	0.76–0.79
West Coast	795	159	25.27	0.62	0.58–0.67
Otago	3,915	783	24.53	0.60	0.58–0.62
Southland	4,284	857	38.72	0.95	0.92–0.98
New Zealand	182,044	36,409	40.68	1.00	
Injury Admissions					
Nelson Marlborough	1,265	253	9.70	0.89	0.84–0.94
South Canterbury	584	117	11.29	1.04	0.96–1.13
Canterbury	5,240	1,048	10.86	1.00	0.97–1.03
West Coast	358	72	11.38	1.05	0.94–1.16
Otago	1,364	273	8.55	0.79	0.75–0.83
Southland	1,140	228	10.30	0.95	0.89–1.00
New Zealand	48,650	9,730	10.87	1.00	

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

South Island Distribution by Cause

Hospital Admissions for Medical Conditions: In the South Island DHBs during 2007–2011, asthma, acute upper respiratory infections, gastroenteritis and viral infections of unspecified site made the largest individual contributions to hospitalisations for medical conditions with a social gradient, Infectious and respiratory diseases collectively were responsible for the majority of medical admissions during this period (**Table 53 –Table 58**).

Hospital Admissions for Injuries: In all of the South Island DHBs during 2007–2011, falls, followed by inanimate mechanical forces, were the most frequent reasons for injury admissions with a social gradient, although transport injuries as a group also made a significant contribution (**Table 53 –Table 58**).

Table 53. Hospital Admissions for Conditions with a Social Gradient in Children Aged 0–14 Years (Excluding Neonates) by Primary Diagnosis, Nelson Marlborough 2007–2011

Primary Diagnosis	Nelson Marlborough			
	Number: Total 2007–2011	Number: Annual Average	Rate per 1,000	% of Total
Children 0–14 Years				
Medical Conditions				
Gastroenteritis	521	104.2	3.99	15.4
Acute Upper Respiratory Infections	477	95.4	3.66	14.1
Asthma	463	92.6	3.55	13.7
Acute Bronchiolitis	398	79.6	3.05	11.7
Viral Infection of Unspecified Site	383	76.6	2.94	11.3
Pneumonia: Bacterial, Non-Viral	222	44.4	1.70	6.6
Croup/Laryngitis/Tracheitis/Epiglottitis	195	39.0	1.49	5.8
Skin Infections	177	35.4	1.36	5.2
Urinary Tract Infection	103	20.6	0.79	3.0
Febrile Convulsions	96	19.2	0.74	2.8
Epilepsy/Status Epilepticus	85	17.0	0.65	2.5
Otitis Media	70	14.0	0.54	2.1
Dermatitis and Eczema	53	10.6	0.41	1.6
Inguinal Hernia	33	6.6	0.25	1.0
Pneumonia: Viral	28	5.6	0.21	0.8
Osteomyelitis	22	4.4	0.17	0.6
Vaccine Preventable Diseases	14	2.8	0.11	0.4
Nutritional Deficiencies/Anaemias	14	2.8	0.11	0.4
Meningitis: Viral, Other, NOS	11	2.2	0.08	0.3
Bronchiectasis	10	2.0	0.08	0.3
Meningococcal Disease	6	1.2	0.05	0.2
Rheumatic Fever/Heart Disease	5	1.0	0.04	0.1
Meningitis: Bacterial	<3	s	s	s
Tuberculosis	<3	s	s	s
Nelson Marlborough Total	3,388	677.6	25.97	100.0
Injury Admissions				
Falls	644	128.8	4.94	50.9
Mechanical Forces: Inanimate	228	45.6	1.75	18.0
Transport: Cyclist	110	22.0	0.84	8.7
Accidental Poisoning	109	21.8	0.84	8.6
Mechanical Forces: Animate	64	12.8	0.49	5.1
Electricity/Fire/Burns	57	11.4	0.44	4.5
Transport: Vehicle Occupant	33	6.6	0.25	2.6
Transport: Pedestrian	19	3.8	0.15	1.5
Drowning/Submersion	<3	s	s	s
Nelson Marlborough Total	1,265	253.0	9.70	100.0

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



Table 54. Hospital Admissions for Conditions with a Social Gradient in Children Aged 0–14 Years (Excluding Neonates) by Primary Diagnosis, South Canterbury 2007–2011

Primary Diagnosis	South Canterbury			
	Number: Total 2007–2011	Number: Annual Average	Rate per 1,000	% of Total
Children 0–14 Years				
Medical Conditions				
Gastroenteritis	236	47.2	4.56	20.4
Asthma	155	31.0	3.00	13.4
Viral Infection of Unspecified Site	146	29.2	2.82	12.6
Acute Upper Respiratory Infections	130	26.0	2.51	11.2
Acute Bronchiolitis	129	25.8	2.49	11.1
Croup/Laryngitis/Tracheitis/Epiglottitis	70	14.0	1.35	6.0
Pneumonia: Bacterial, Non-Viral	68	13.6	1.32	5.9
Febrile Convulsions	53	10.6	1.02	4.6
Skin Infections	47	9.4	0.91	4.1
Urinary Tract Infection	33	6.6	0.64	2.8
Epilepsy/Status Epilepticus	21	4.2	0.41	1.8
Otitis Media	18	3.6	0.35	1.6
Dermatitis and Eczema	18	3.6	0.35	1.6
Pneumonia: Viral	14	2.8	0.27	1.2
Inguinal Hernia	10	2.0	0.19	0.9
Osteomyelitis	4	0.8	0.08	0.3
Nutritional Deficiencies/Anaemias	3	0.6	0.06	0.3
Vaccine Preventable Diseases	<3	s	s	s
Bronchiectasis	<3	s	s	s
South Canterbury Total	1,158	231.6	22.39	100.0
Injury Admissions				
Falls	298	59.6	5.76	51.0
Mechanical Forces: Inanimate	100	20.0	1.93	17.1
Transport: Cyclist	50	10.0	0.97	8.6
Accidental Poisoning	44	8.8	0.85	7.5
Mechanical Forces: Animate	42	8.4	0.81	7.2
Electricity/Fire/Burns	25	5.0	0.48	4.3
Transport: Vehicle Occupant	13	2.6	0.25	2.2
Transport: Pedestrian	10	2.0	0.19	1.7
Drowning/Submersion	<3	s	s	s
South Canterbury Total	584	116.8	11.29	100.0

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

Table 55. Hospital Admissions for Conditions with a Social Gradient in Children Aged 0–14 Years (Excluding Neonates) by Primary Diagnosis, Canterbury 2007–2011

Primary Diagnosis	Canterbury			
	Number: Total 2007–2011	Number: Annual Average	Rate per 1,000	% of Total
Children 0–14 Years				
Medical Conditions				
Acute Upper Respiratory Infections	2,604	520.8	5.40	17.1
Gastroenteritis	2,447	489.4	5.07	16.1
Asthma	2,229	445.8	4.62	14.7
Viral Infection of Unspecified Site	1,834	366.8	3.80	12.1
Acute Bronchiolitis	1,590	318.0	3.30	10.5
Pneumonia: Bacterial, Non-Viral	817	163.4	1.69	5.4
Skin Infections	738	147.6	1.53	4.9
Urinary Tract Infection	631	126.2	1.31	4.2
Croup/Laryngitis/Tracheitis/Epiglottitis	599	119.8	1.24	3.9
Epilepsy/Status Epilepticus	405	81.0	0.84	2.7
Dermatitis and Eczema	276	55.2	0.57	1.8
Otitis Media	242	48.4	0.50	1.6
Febrile Convulsions	235	47.0	0.49	1.5
Pneumonia: Viral	121	24.2	0.25	0.8
Osteomyelitis	95	19.0	0.20	0.6
Inguinal Hernia	92	18.4	0.19	0.6
Meningitis: Viral, Other, NOS	61	12.2	0.13	0.4
Vaccine Preventable Diseases	48	9.6	0.10	0.3
Nutritional Deficiencies/Anaemias	35	7.0	0.07	0.2
Bronchiectasis	31	6.2	0.06	0.2
Meningococcal Disease	21	4.2	0.04	0.1
Rheumatic Fever/Heart Disease	19	3.8	0.04	0.1
Meningitis: Bacterial	14	2.8	0.03	0.1
Tuberculosis	6	1.2	0.01	0.0
Canterbury Total	15,190	3,038.0	31.49	100.0
Injury Admissions				
Falls	2,618	523.6	5.43	50.0
Mechanical Forces: Inanimate	1,234	246.8	2.56	23.5
Accidental Poisoning	464	92.8	0.96	8.9
Mechanical Forces: Animate	310	62.0	0.64	5.9
Transport: Cyclist	288	57.6	0.60	5.5
Electricity/Fire/Burns	170	34.0	0.35	3.2
Transport: Vehicle Occupant	70	14.0	0.15	1.3
Transport: Pedestrian	68	13.6	0.14	1.3
Drowning/Submersion	18	3.6	0.04	0.3
Canterbury Total	5,240	1,048.0	10.86	100.0

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



Table 56. Hospital Admissions for Conditions with a Social Gradient in Children Aged 0–14 Years (Excluding Neonates) by Primary Diagnosis, the West Coast 2007–2011

Primary Diagnosis	West Coast			
	Number: Total 2007–2011	Number: Annual Average	Rate per 1,000	% of Total
Children 0–14 Years				
Medical Conditions				
Asthma	152	30.4	4.83	19.1
Gastroenteritis	129	25.8	4.10	16.2
Viral Infection of Unspecified Site	100	20.0	3.18	12.6
Acute Upper Respiratory Infections	92	18.4	2.92	11.6
Acute Bronchiolitis	86	17.2	2.73	10.8
Pneumonia: Bacterial, Non-Viral	68	13.6	2.16	8.6
Croup/Laryngitis/Tracheitis/Epiglottitis	29	5.8	0.92	3.6
Febrile Convulsions	28	5.6	0.89	3.5
Skin Infections	26	5.2	0.83	3.3
Otitis Media	14	2.8	0.45	1.8
Urinary Tract Infection	12	2.4	0.38	1.5
Pneumonia: Viral	11	2.2	0.35	1.4
Epilepsy/Status Epilepticus	11	2.2	0.35	1.4
Dermatitis and Eczema	8	1.6	0.25	1.0
Inguinal Hernia	7	1.4	0.22	0.9
Meningococcal Disease	6	1.2	0.19	0.8
Osteomyelitis	5	1.0	0.16	0.6
Bronchiectasis	5	1.0	0.16	0.6
Meningitis: Viral, Other, NOS	4	0.8	0.13	0.5
Vaccine Preventable Diseases	<3	s	s	s
West Coast Total	795	159.0	25.27	100.0
Injury Admissions				
Falls	189	37.8	6.01	52.8
Mechanical Forces: Inanimate	67	13.4	2.13	18.7
Transport: Cyclist	24	4.8	0.76	6.7
Mechanical Forces: Animate	23	4.6	0.73	6.4
Accidental Poisoning	18	3.6	0.57	5.0
Electricity/Fire/Burns	16	3.2	0.51	4.5
Transport: Vehicle Occupant	13	2.6	0.41	3.6
Transport: Pedestrian	7	1.4	0.22	2.0
Drowning/Submersion	<3	s	s	s
West Coast Total	358	71.6	11.38	100.0

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

Table 57. Hospital Admissions for Conditions with a Social Gradient in Children Aged 0–14 Years (Excluding Neonates) by Primary Diagnosis, Otago 2007–2011

Primary Diagnosis	Otago			
	Number: Total 2007–2011	Number: Annual Average	Rate per 1,000	% of Total
Children 0–14 Years				
Medical Conditions				
Gastroenteritis	727	145.4	4.56	18.6
Acute Upper Respiratory Infections	704	140.8	4.41	18.0
Asthma	571	114.2	3.58	14.6
Acute Bronchiolitis	426	85.2	2.67	10.9
Viral Infection of Unspecified Site	236	47.2	1.48	6.0
Pneumonia: Bacterial, Non-Viral	230	46.0	1.44	5.9
Skin Infections	229	45.8	1.44	5.8
Croup/Laryngitis/Tracheitis/Epiglottitis	183	36.6	1.15	4.7
Urinary Tract Infection	155	31.0	0.97	4.0
Epilepsy/Status Epilepticus	109	21.8	0.68	2.8
Otitis Media	94	18.8	0.59	2.4
Dermatitis and Eczema	50	10.0	0.31	1.3
Inguinal Hernia	45	9.0	0.28	1.1
Febrile Convulsions	43	8.6	0.27	1.1
Pneumonia: Viral	41	8.2	0.26	1.0
Osteomyelitis	27	5.4	0.17	0.7
Meningococcal Disease	13	2.6	0.08	0.3
Meningitis: Viral, Other, NOS	11	2.2	0.07	0.3
Vaccine Preventable Diseases	7	1.4	0.04	0.2
Nutritional Deficiencies/Anaemias	7	1.4	0.04	0.2
Meningitis: Bacterial	3	0.6	0.02	0.1
Bronchiectasis	3	0.6	0.02	0.1
Rheumatic Fever/Heart Disease	<3	s	s	s
Otago Total	3,915	783.0	24.53	100.0
Injury Admissions				
Falls	694	138.8	4.35	50.9
Mechanical Forces: Inanimate	274	54.8	1.72	20.1
Transport: Cyclist	107	21.4	0.67	7.8
Accidental Poisoning	87	17.4	0.55	6.4
Mechanical Forces: Animate	82	16.4	0.51	6.0
Electricity/Fire/Burns	52	10.4	0.33	3.8
Transport: Vehicle Occupant	37	7.4	0.23	2.7
Transport: Pedestrian	25	5.0	0.16	1.8
Drowning/Submersion	6	1.2	0.04	0.4
Otago Total	1,364	272.8	8.55	100.0

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



Table 58. Hospital Admissions for Conditions with a Social Gradient in Children Aged 0–14 Years (Excluding Neonates) by Primary Diagnosis, Southland 2007–2011

Primary Diagnosis	Southland			
	Number: Total 2007–2011	Number: Annual Average	Rate per 1,000	% of Total
Children 0–14 Years				
Medical Conditions				
Gastroenteritis	732	146.4	6.62	17.1
Acute Bronchiolitis	685	137.0	6.19	16.0
Acute Upper Respiratory Infections	585	117.0	5.29	13.7
Asthma	538	107.6	4.86	12.6
Viral Infection of Unspecified Site	470	94.0	4.25	11.0
Pneumonia: Bacterial, Non-Viral	218	43.6	1.97	5.1
Skin Infections	191	38.2	1.73	4.5
Epilepsy/Status Epilepticus	185	37.0	1.67	4.3
Croup/Laryngitis/Tracheitis/Epiglottitis	178	35.6	1.61	4.2
Urinary Tract Infection	121	24.2	1.09	2.8
Otitis Media	109	21.8	0.99	2.5
Dermatitis and Eczema	68	13.6	0.61	1.6
Febrile Convulsions	64	12.8	0.58	1.5
Inguinal Hernia	39	7.8	0.35	0.9
Pneumonia: Viral	31	6.2	0.28	0.7
Osteomyelitis	19	3.8	0.17	0.4
Meningococcal Disease	15	3.0	0.14	0.4
Bronchiectasis	14	2.8	0.13	0.3
Vaccine Preventable Diseases	10	2.0	0.09	0.2
Meningitis: Viral, Other, NOS	6	1.2	0.05	0.1
Nutritional Deficiencies/Anaemias	4	0.8	0.04	0.1
Meningitis: Bacterial	<3	s	s	s
Rheumatic Fever/Heart Disease	<3	s	s	s
Southland Total	4,284	856.8	38.72	100.0
Injury Admissions				
Falls	466	93.2	4.21	40.9
Mechanical Forces: Inanimate	306	61.2	2.77	26.8
Accidental Poisoning	142	28.4	1.28	12.5
Transport: Cyclist	69	13.8	0.62	6.1
Mechanical Forces: Animate	66	13.2	0.60	5.8
Electricity/Fire/Burns	42	8.4	0.38	3.7
Transport: Vehicle Occupant	28	5.6	0.25	2.5
Transport: Pedestrian	19	3.8	0.17	1.7
Drowning/Submersion	<3	s	s	s
Southland Total	1,140	228.0	10.3	100.0

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

South Island Distribution by Cause

Mortality: Across the South Island DHBs during 2005–2009, a number of children died as a result of medical conditions or injuries with a social gradient, or from SUDI in the post neonatal period (**Table 59**).

Table 59. Mortality from Conditions with a Social Gradient in Children Aged 0–14 Years (Excluding Neonates) by Main Underlying Cause of Death, South Island DHBs 2005–2009

Cause of Death	Number: Total 2005–2009	Number: Annual Average	Rate per 100,000
Nelson Marlborough			
Medical Conditions	<3	s	s
Injuries	7	1.4	5.36
SUDI (Infant)	0	0.0	0.00
Nelson Marlborough Total	8	1.6	6.12
South Canterbury			
Medical Conditions	<3	s	s
Injuries	0	0.0	0.00
SUDI (Infant)	<3	s	s
South Canterbury Total	4	0.8	7.63
Canterbury			
Medical Conditions	3	0.6	0.63
Injuries	17	3.4	3.59
SUDI (Infant)	18	3.6	3.80
Canterbury Total	38	7.6	8.02
West Coast			
Medical Conditions	0	0.0	0.00
Injuries	<3	s	s
SUDI (Infant)	0	0.0	0.00
West Coast Total	<3	s	s
Otago			
Medical Conditions	3	0.6	1.86
Injuries	9	1.8	5.58
SUDI (Infant)	3	0.6	1.86
Otago Total	15	3.0	9.30
Southland			
Medical Conditions	5	1.0	4.50
Injuries	5	1.0	4.50
SUDI (Infant)	7	1.4	6.31
Southland Total	17	3.4	15.32

Source: Numerator: National Mortality Collection (neonates removed); Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: s: suppressed due to small numbers



South Island Trends

Medical Conditions: In Nelson Marlborough, South Canterbury and Otago during 2000–2011, hospital admissions for medical conditions with a social gradient were relatively static, with rates remaining lower than the New Zealand rate throughout this period. In Canterbury and the West Coast, medical admissions declined, with rates being much lower than the New Zealand rate during the mid to late 2000s. In Southland, rates increased during the mid to late 2000s, so that while rates were lower than the New Zealand rate during the mid 2000s, they were similar to the New Zealand rate during 2009–2011 (**Figure 107**).

Injuries: In Nelson Marlborough and Otago during 2000–2011, hospital admissions for injuries with a social gradient were generally lower than the New Zealand rate, while rates in the other South Island DHBs were more variable (**Figure 107**).

South Island Distribution by Ethnicity

Medical Conditions: In Canterbury during 2000–2011, hospital admissions for medical conditions with a social gradient were higher for Pacific children than for Māori and European/Other children, while in Nelson Marlborough and Otago admissions were generally higher for Māori than for European/Other children. Ethnic differences in South Canterbury, the West Coast and Southland were less consistent, although rates for Māori children in all of the South Island DHBs were consistently lower than the NZ Māori rate (**Figure 108**).

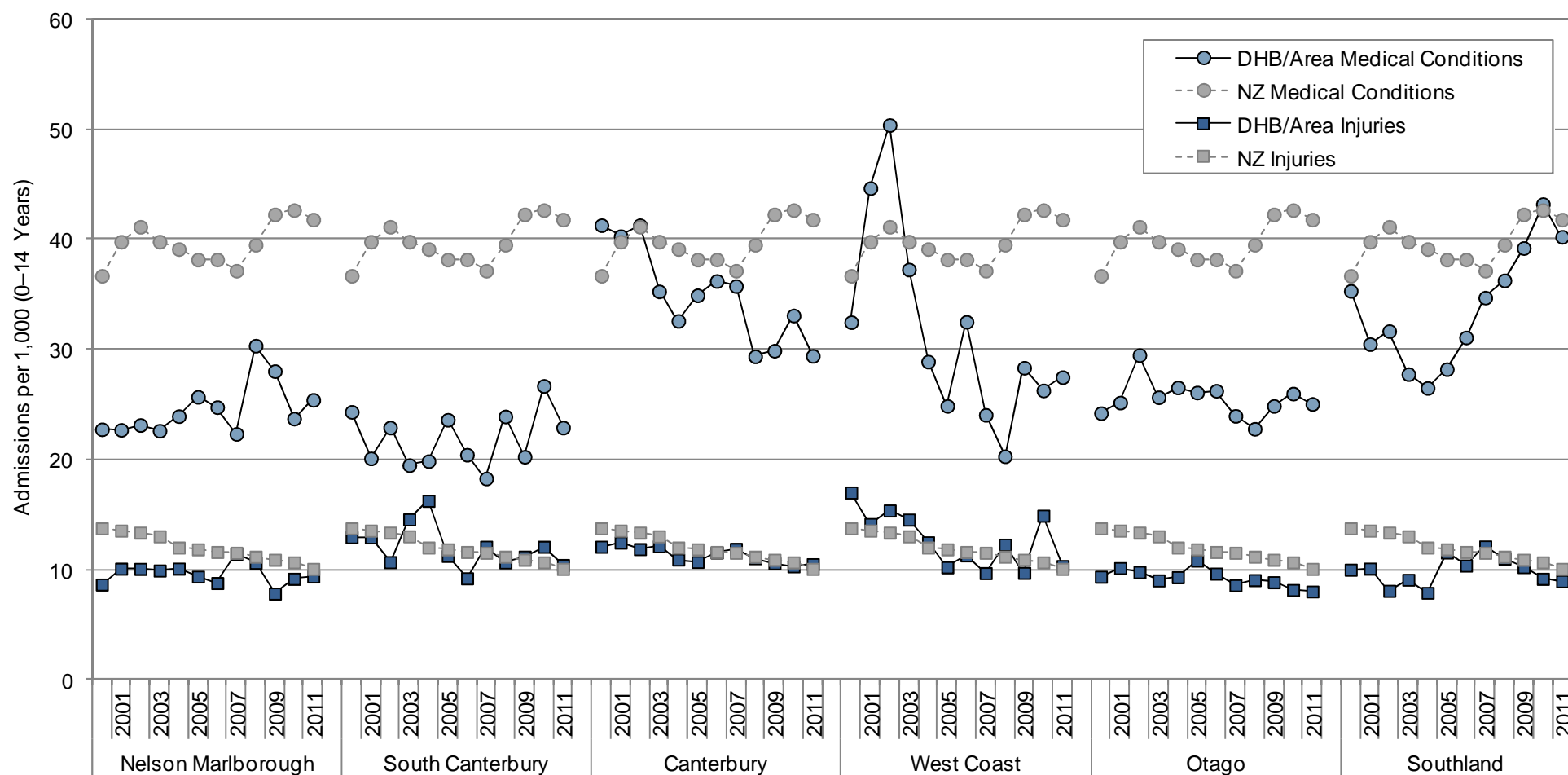
Injuries: In Canterbury, Otago and Southland during 2000–2011, hospital admissions for injuries with a social gradient were generally higher for European/Other children than for Māori children, although ethnic differences were less evident in the other South Island DHBs (**Figure 108**).

Local Policy Documents and Evidence-Based Reviews Relevant to the Prevention of Socioeconomically Sensitive Hospital Admissions and Mortality in Children

Given the complex causal pathways leading to socioeconomic gradients in hospital admissions and mortality during childhood, it is likely that an integrated policy framework covering a range of areas (e.g. housing, income support, reductions in exposure to second-hand cigarette smoke, immunisation) will be required, if reductions in admissions and mortality are to be achieved. **Table 3** on **Page 62** thus provides a brief overview of local policy documents and evidence-based reviews which consider policies to address the social determinants of health, while **Table 12** on **Page 103** reviews documents which consider the relationship between housing and health. In addition **Table 38** on **Page 197** reviews publications focused on the prevention of second-hand cigarette exposure in children, while **Table 33** on **Page 197** considers publications relevant to the cessation of smoking in pregnancy. Finally **Table 23** on **Page 166** reviews publications relevant to immunisation and interventions aimed at increasing immunisation coverage.

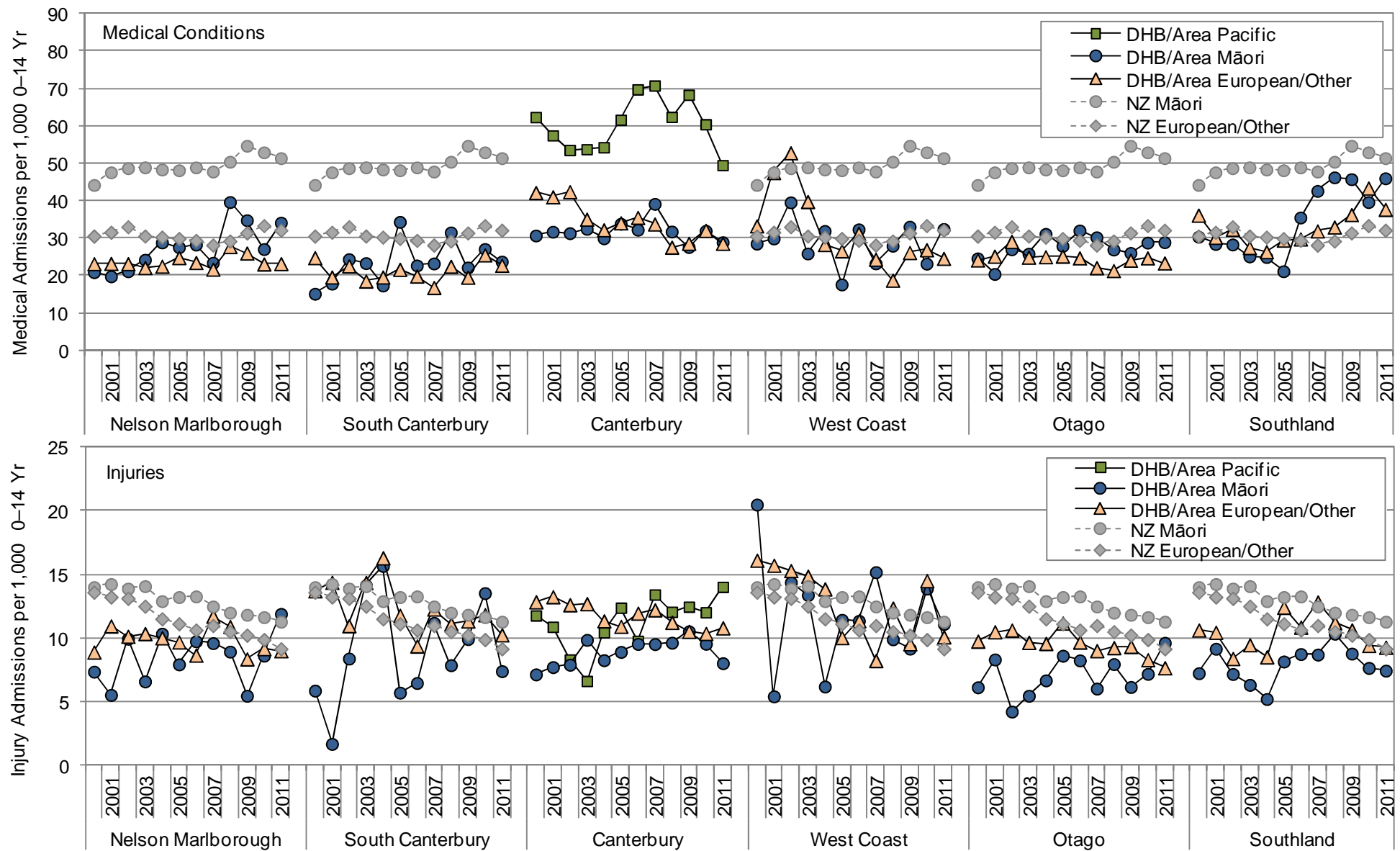


Figure 107. Hospital Admissions for Conditions with a Social Gradient in Children Aged 0–14 Years, South Island DHBs vs. New Zealand 2000–2011



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

Figure 108. Hospital Admissions for Medical Conditions and Injuries with a Social Gradient in Children Aged 0–14 Years by Ethnicity, South Island DHBs vs. New Zealand 2000–2011



Source: Numerator: National Minimum Dataset (acute and arranged admissions only, neonates removed); Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: Ethnicity is Level 1 Prioritised

INFANT MORTALITY AND SUDDEN UNEXPECTED DEATH IN INFANCY

Introduction

Infant mortality is often used as a barometer of the social wellbeing of a country [131]. New Zealand's infant mortality rates are middling by international standards², being lower than those of the USA and some Eastern European countries, but higher than those of Central and Northern Europe [133]. However, mortality during the first year of life remains much higher than at any other point during childhood or adolescence, with 308 New Zealand infants dying prior to their first birthday during 2009 [134]. Further, ethnic and socioeconomic disparities, remain with infant mortality rates in 2008 (provisional data) being 6.9 per 1,000 live births for Māori babies, 5.9 for Pacific babies, and 3.8 for non-Māori non-Pacific babies [132].

Despite the relatively high number of deaths, New Zealand's infant mortality rates have declined during the past 40 years, with rates falling from 16.9 per 1,000 live births in 1969, to 4.9 per 1,000 in March 2009 [134]. However, while total infant mortality rates are generally higher for Pacific and Māori babies, for males, and those in the most deprived areas [135], total infant mortality is of limited utility in guiding population health interventions, as the causes of mortality differ markedly with the age of the infant. During the neonatal period (birth–28 days) extreme prematurity, congenital anomalies and intrauterine/birth asphyxia are the leading causes of mortality, while in the post neonatal period (29–364 days) sudden unexpected death in infancy (SUDI) and congenital anomalies make the greatest contribution [128]. Thus any interventions aimed at reducing New Zealand's infant mortality rates must, in the first instance, be based on an understanding of their component causes.

The following section uses information from the National Mortality Collection to review neonatal, post neonatal and total infant mortality, as well as SUDI rates since 1990.

Data Source and Methods

Definition

1. *Total Infant Mortality: Death of a live born infant prior to 365 days of life*
2. *Neonatal Mortality: Death of a live born infant in the first 28 days of life*
3. *Post Neonatal Mortality: Death of a live born infant after 28 days but prior to 365 days of life*
4. *Sudden Unexpected Death in Infancy (SUDI): Death of a live born infant <365 days of life, where the cause of death is Sudden Infant Death Syndrome (SIDS), Accidental Suffocation/Strangulation in Bed or Ill-Defined/Unspecified Causes*

Data Sources

Numerator: National Mortality Collection: All deaths in the first year of life, using the definitions for total infant, neonatal and post neonatal mortality outlined above. Cause of death is derived from the ICD-10-AM main underlying cause of death as follows: Congenital Anomalies: CVS (Q20); Congenital Anomalies: CNS (Q00–Q07); Congenital Anomalies: Other (Q00–Q99); Intrauterine/Birth Asphyxia (P20–P21); Extreme Prematurity (P07.2); Other Perinatal Conditions (P00–P96); SUDI: SIDS (R95); SUDI: Unspecified (R96, R98, R99); SUDI: Suffocation/Strangulation in Bed (W75); Injury/Poisoning (V01–Y36).

Denominator: Birth Registration Dataset (Live Births Only)

Notes on Interpretation

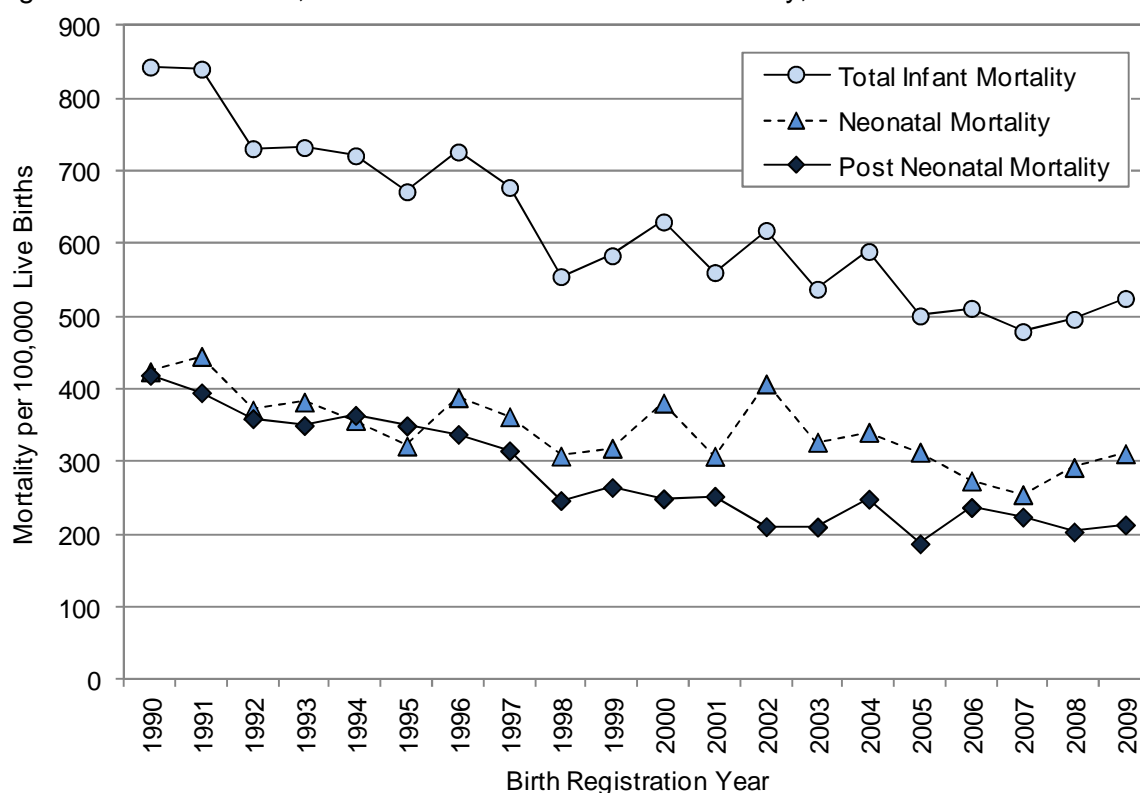
Note 1: See **Appendix 5** for an overview of the National Mortality Collection

² In New Zealand, the infant mortality rate in 2009 was 4.7 per 1,000 live births, compared to the OECD average of 4.4. By comparison the mortality rate was 3.1 in Finland and 6.5 in the USA (2008 data) [132].



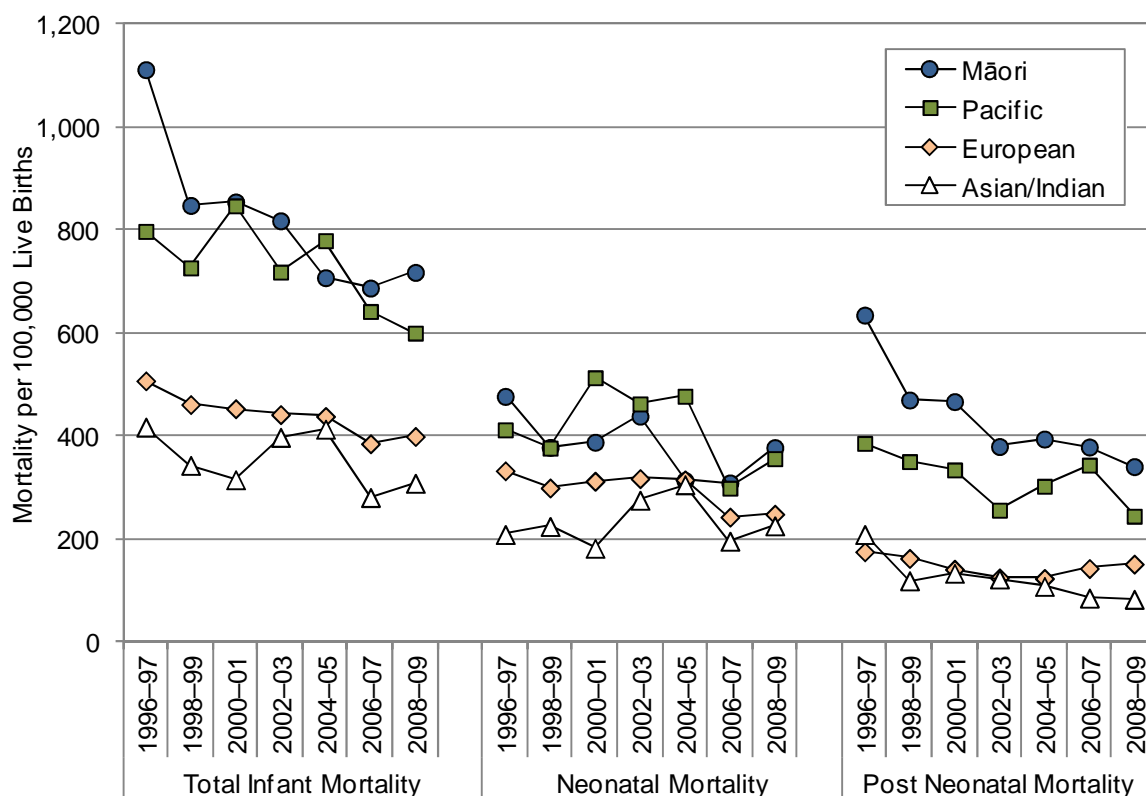
Total Infant, Neonatal and Post Neonatal Mortality

Figure 109. Total Infant, Neonatal and Post Neonatal Mortality, New Zealand 1990–2009



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

Figure 110. Total Infant, Neonatal and Post Neonatal Mortality by Ethnicity, New Zealand 1996–2009



Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Note: Ethnicity is Level 1 prioritised

New Zealand Distribution and Trends

New Zealand Trends

In New Zealand during the 1990s, neonatal and post neonatal mortality both declined, although rates were more static during the mid to late 2000s. An upswing in neonatal mortality was evident during 2007–2009. However it is too early to say whether this is a random fluctuation or the beginning of an upward trend (**Figure 109**).

Trends by Ethnicity

In New Zealand during 1996–2009, while there was some year to year variation, neonatal mortality was generally higher for Pacific and Māori infants than for European and Asian/Indian infants. Post neonatal mortality however was consistently higher for Māori > Pacific > European and Asian/Indian infants during this period (**Figure 110**).

Distribution by Cause

In New Zealand during 2005–2009, extreme prematurity and congenital anomalies were the leading causes of neonatal mortality, although intrauterine/birth asphyxia and other perinatal conditions also made a significant contribution. In contrast, SUDI was the leading cause of post neonatal mortality, followed by congenital anomalies (**Table 60**).

Table 60. Neonatal and Post Neonatal Mortality Cause of Death, New Zealand 2005–2009

Cause of Death	Number: Total 2005–2009	Number: Annual Average	Rate per 100,000	Percent of Deaths
New Zealand				
Neonatal Mortality				
Extreme Prematurity	213	42.6	68.11	23.6
Congenital Anomalies: CVS	68	13.6	21.74	7.5
Congenital Anomalies: CNS	34	6.8	10.87	3.8
Congenital Anomalies: Other	131	26.2	41.89	14.5
Intrauterine/Birth Asphyxia	46	9.2	14.71	5.1
Other Perinatal Conditions	327	65.4	104.56	36.2
SUDI: Suffocation/Strangulation in Bed	26	5.2	8.31	2.9
SUDI: SIDS/Unspecified	17	3.4	5.44	1.9
Injury/Poisoning	10	2.0	3.20	1.1
Other Causes	31	6.2	9.91	3.4
Total Neonatal Mortality	903	180.6	288.74	100.0
Post Neonatal Mortality				
SUDI: SIDS	174	34.8	55.64	26.1
SUDI: Suffocation/Strangulation in Bed	88	17.6	28.14	13.2
SUDI: Unspecified	8	1.6	2.56	1.2
Congenital Anomalies: CVS	55	11.0	17.59	8.2
Congenital Anomalies: CNS	8	1.6	2.56	1.2
Congenital Anomalies: Other	57	11.4	18.23	8.5
Other Perinatal Conditions	82	16.4	26.22	12.3
Injury/Poisoning	21	4.2	6.72	3.1
Other Causes	174	34.8	55.64	26.1
Total Post Neonatal Mortality	667	133.4	213.28	100.0
New Zealand Total	1,570	314.0	502.02	100.0

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



Distribution by Ethnicity, NZ Deprivation Index Decile and Gender

In New Zealand during 2005–2009, neonatal mortality was *significantly* higher for Pacific and Māori infants than for European infants, for males and for those from average to more deprived (NZDep deciles 5–10) areas. During the same period, post neonatal mortality was also *significantly* higher for Māori and Pacific infants than for European and Asian/Indian infants, for males and for those from more deprived (NZDep deciles 7–10) areas (**Table 61**).

Table 61. Distribution of Neonatal and Post Neonatal Mortality by NZ Deprivation Index Decile, Ethnicity and Gender, New Zealand 2005–2009

Variable	Rate	RR	95% CI	Variable	Rate	RR	95% CI
Neonatal Mortality							
NZ Deprivation Index Decile				Ethnicity			
Deciles 1–2	175.12	1.00		Asian/Indian	219.03	0.86	0.67–1.12
Deciles 3–4	198.74	1.13	0.85–1.51	European	253.38	1.00	
Deciles 5–6	267.82	1.53	1.17–1.99	Māori	341.65	1.35	1.16–1.56
Deciles 7–8	315.99	1.80	1.40–2.32	Pacific	352.98	1.39	1.14–1.71
Deciles 9–10	404.58	2.31	1.82–2.93	Gender			
				Female	256.91	1.00	
				Male	318.91	1.24	1.09–1.42
Post Neonatal Mortality							
NZ Deprivation Index Decile				Ethnicity			
Deciles 1–2	127.17	1.00		Asian/Indian	88.26	0.63	0.42–0.94
Deciles 3–4	119.25	0.94	0.66–1.33	European	139.59	1.00	
Deciles 5–6	153.78	1.21	0.87–1.67	Māori	354.67	2.54	2.14–3.02
Deciles 7–8	204.89	1.61	1.19–2.17	Pacific	279.45	2.00	1.57–2.55
Deciles 9–10	367.25	2.89	2.19–3.80	Gender			
				Female	181.35	1.00	
				Male	243.54	1.34	1.15–1.57

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Note: Rates are per 100,000 live births; Rate Ratios are unadjusted; Ethnicity is Level 1 prioritised

South Island Distribution and Trends

South Island vs. New Zealand

In the West Coast during 2005–2009, neonatal mortality was *significantly* higher than the New Zealand rate, although rates in the other South Island DHBs were not *significantly* different from the New Zealand rate. In contrast, post neonatal mortality was *significantly* lower than the New Zealand rate in Nelson Marlborough, Canterbury and Otago, with rates in the other DHBs not being significantly different from the New Zealand rate (there were no post neonatal deaths in the West Coast during this period) (**Table 62**).

South Island Trends

In the South Island DHBs during 1990–2009, large year to year fluctuations in rates (possibly as a result of small numbers) made trends in neonatal and post neonatal mortality difficult to interpret. However, total infant mortality rates exhibited a general downward trend in Nelson Marlborough, Canterbury, Otago and Southland during this period (**Figure 111**, **Figure 112**).

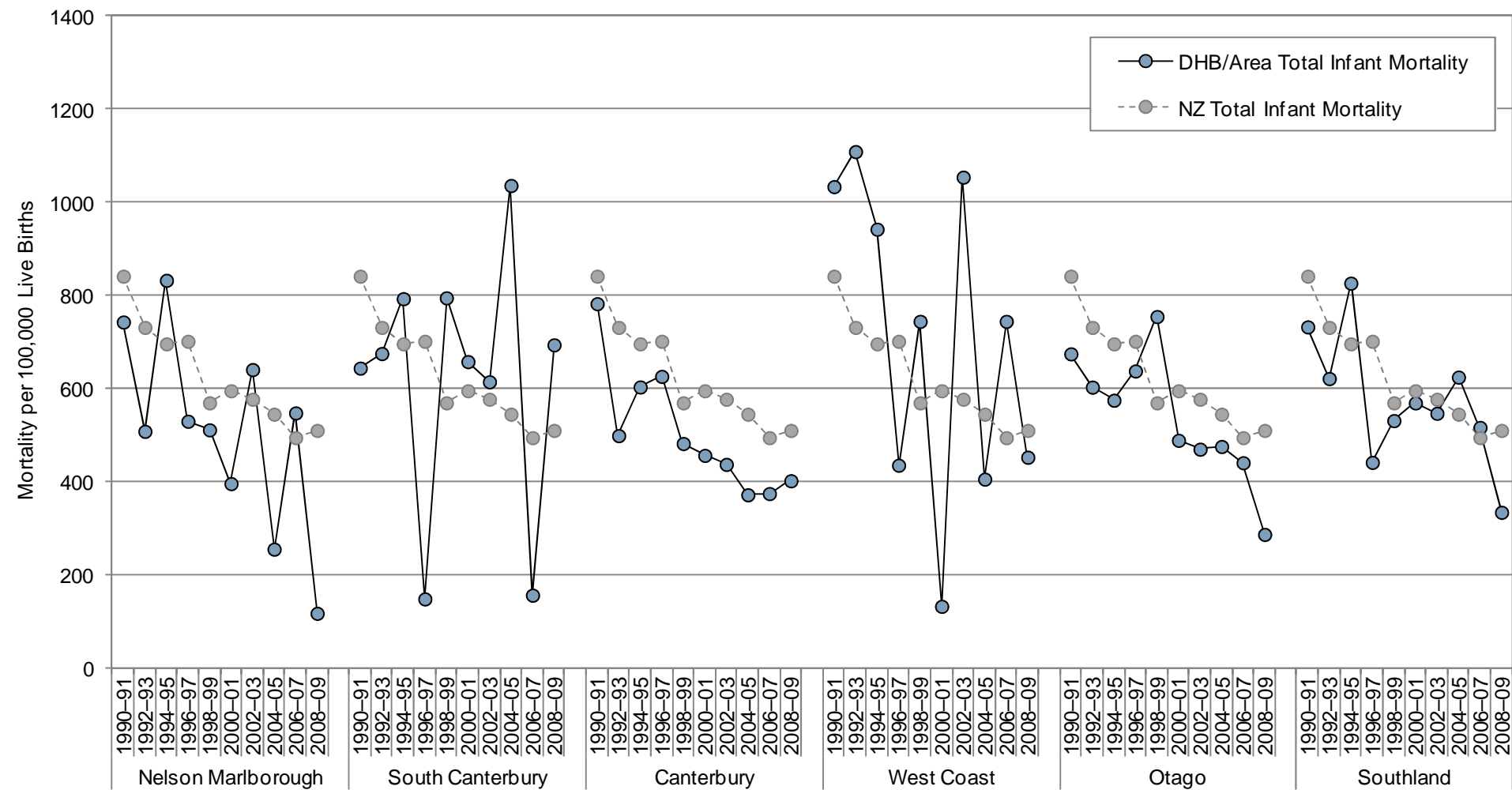
Table 62. Neonatal and Post Neonatal Mortality, South Island DHBs vs. New Zealand 2005–2009

DHB/Area	Total No. Deaths 2005–2009	No. Deaths Annual Average	Rate per 100,000	Rate Ratio	95% CI
Neonatal Mortality					
Nelson Marlborough	20	4.0	243.40	0.84	0.54–1.31
South Canterbury	12	2.4	378.91	1.31	0.74–2.32
Canterbury	75	15.0	232.08	0.80	0.64–1.02
West Coast	11	2.2	541.61	1.88	1.04–3.39
Otago	28	5.6	273.28	0.95	0.65–1.38
Southland	16	3.2	204.21	0.71	0.43–1.16
New Zealand	903	180.6	288.74	1.00	
Post Neonatal Mortality					
Nelson Marlborough	5	1.0	60.85	0.29	0.12–0.69
South Canterbury	5	1.0	157.88	0.74	0.31–1.78
Canterbury	47	9.4	145.44	0.68	0.51–0.92
West Coast	0	0.0	–	–	–
Otago	10	2.0	97.60	0.46	0.25–0.85
Southland	20	4.0	255.27	1.20	0.77–1.87
New Zealand	667	133.4	213.28	1.00	

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

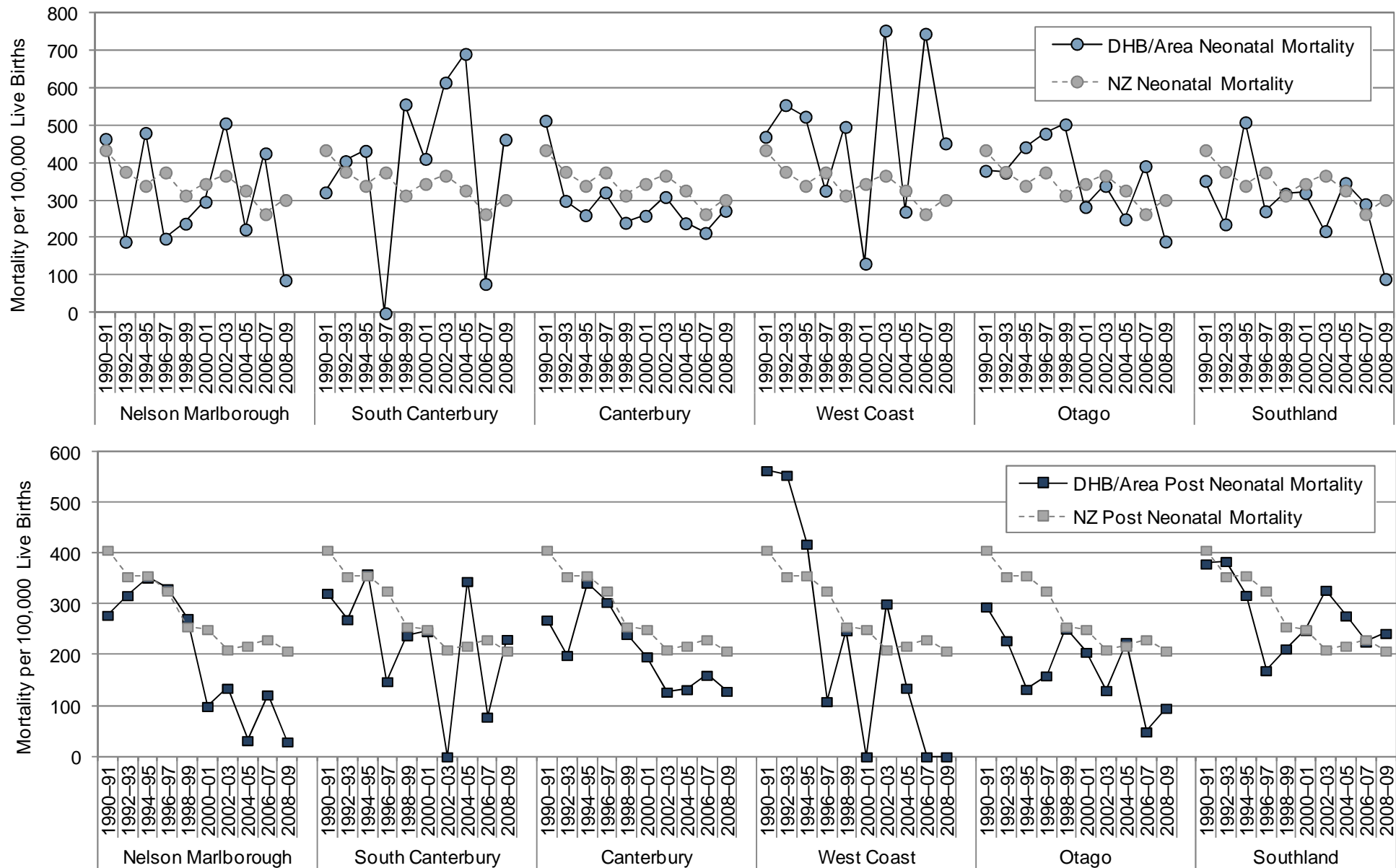


Figure 111. Total Infant Mortality, South Island DHBs vs. New Zealand 1990–2009



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

Figure 112. Neonatal and Post Neonatal Mortality, South Island DHBs vs. New Zealand 1990–2009



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

South Island Distribution by Cause

In the South Island DHBs during 2005–2009, congenital anomalies and extreme prematurity were the most frequent causes of neonatal mortality, while SUDI and congenital anomalies were the most frequent causes of post neonatal mortality (**Table 63**, **Table 64**, **Table 65**).

Table 63. Neonatal and Post Neonatal Mortality by Cause of Death, Nelson Marlborough, South Canterbury and the West Coast DHBs 2005–2009

Cause of Death	Number: Total 2005–2009	Number: Annual Average	Rate per 100,000	Percent of Deaths
Nelson Marlborough				
Neonatal Mortality				
Congenital Anomalies	5	1.0	60.85	25.0
Extreme Prematurity	3	0.6	36.51	15.0
Other Perinatal Conditions	8	1.6	97.36	40.0
Other Causes	4	0.8	48.68	20.0
Total Neonatal Mortality	20	4.0	243.40	100.0
Post Neonatal Mortality				
Congenital Anomalies/Other Perinatal Conditions	3	0.6	36.51	60.0
Other Causes	<3	s	s	s
Total Post Neonatal Mortality	5	1.0	60.85	100.0
Nelson Marlborough Total	25	5.0	304.25	100.0
South Canterbury				
Neonatal Mortality				
Extreme Prematurity	4	0.8	126.30	33.3
Congenital Anomalies	4	0.8	126.30	33.3
Intrauterine/Birth Asphyxia/Other Perinatal Conditions	3	0.6	94.73	25.0
Other Conditions	<3	s	s	s
Total Neonatal Mortality	12	2.4	378.91	100.0
Post Neonatal Mortality				
All Causes	5	1.0	157.88	100.0
Total Post Neonatal Mortality	5	1.0	157.88	100.0
South Canterbury Total	17	3.4	536.79	100.0
West Coast				
Neonatal Mortality				
Congenital Anomalies	3	0.6	147.71	27.3
Other Perinatal Conditions	7	1.4	344.66	63.6
Other Causes	<3	s	s	s
Total Neonatal Mortality	11	2.2	541.61	100.0
Post Neonatal Mortality				
Total Post Neonatal Mortality	0	0.0	0.00	100.0
West Coast Total	11	2.2	541.61	100.0

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Note: s: suppressed due to small numbers

Table 64. Neonatal and Post Neonatal Mortality by Cause of Death, Canterbury and Otago 2005–2009

Cause of Death	Number: Total 2005–2009	Number: Annual Average	Rate per 100,000	Percent of Deaths
Canterbury				
Neonatal Mortality				
Extreme Prematurity	12	2.4	37.13	16.0
Congenital Anomalies: CVS	5	1.0	15.47	6.7
Congenital Anomalies: CNS	4	0.8	12.38	5.3
Congenital Anomalies: Other	11	2.2	34.04	14.7
Intrauterine/Birth Asphyxia	4	0.8	12.38	5.3
Other Perinatal Conditions	33	6.6	102.12	44.0
Other Causes	6	1.2	18.57	8.0
Total Neonatal Mortality	75	15.0	232.08	100.0
Post Neonatal Mortality				
SUDI: SIDS	11	2.2	34.04	23.4
SUDI: Suffocation/Strangulation in Bed	7	1.4	21.66	14.9
Congenital Anomalies: CVS	5	1.0	15.47	10.6
Congenital Anomalies: Other	3	0.6	9.28	6.4
Other Perinatal Conditions	8	1.6	24.76	17.0
Other Causes	13	2.6	40.23	27.7
Total Post Neonatal Mortality	47	9.4	145.44	100.0
Canterbury Total	122	24.4	377.52	100.0
Otago				
Neonatal Mortality				
Extreme Prematurity	8	1.6	78.08	28.6
Congenital Anomalies: CNS and CVS	3	0.6	29.28	10.7
Congenital Anomalies: Other	5	1.0	48.80	17.9
Other Perinatal Conditions	11	2.2	107.36	39.3
Other Causes	<3	s	s	s
Total Neonatal Mortality	28	5.6	273.28	100.0
Post Neonatal Mortality				
Congenital Anomalies/Other Perinatal Conditions	3	0.6	29.28	30.0
SUDI: SIDS	3	0.6	29.28	30.0
Other Causes	4	0.8	39.04	40.0
Total Post Neonatal Mortality	10	2.0	97.60	100.0
Otago Total	38	7.6	370.88	100.0

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Note: s: suppressed due to small numbers



Table 65. Neonatal and Post Neonatal Mortality by Cause of Death, Southland 2005–2009

Cause of Death	Number: Total 2005–2009	Number: Annual Average	Rate per 100,000	Percent of Deaths
Southland				
Neonatal Mortality				
Congenital Anomalies	5	1.0	63.82	31.3
Extreme Prematurity/Other Perinatal Conditions	9	1.8	114.87	56.3
Other Causes	<3	s	s	s
Total Neonatal Mortality	16	3.2	204.21	100.0
Post Neonatal Mortality				
SUDI: All Types	7	1.4	89.34	35.0
Congenital Anomalies/Other Perinatal Conditions	7	1.4	89.34	35.0
Other Causes	6	1.2	76.58	30.0
Total Post Neonatal Mortality	20	4.0	255.26	100.0
Southland Total	36	7.2	459.47	100.0

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset Note: s: suppressed due to small numbers

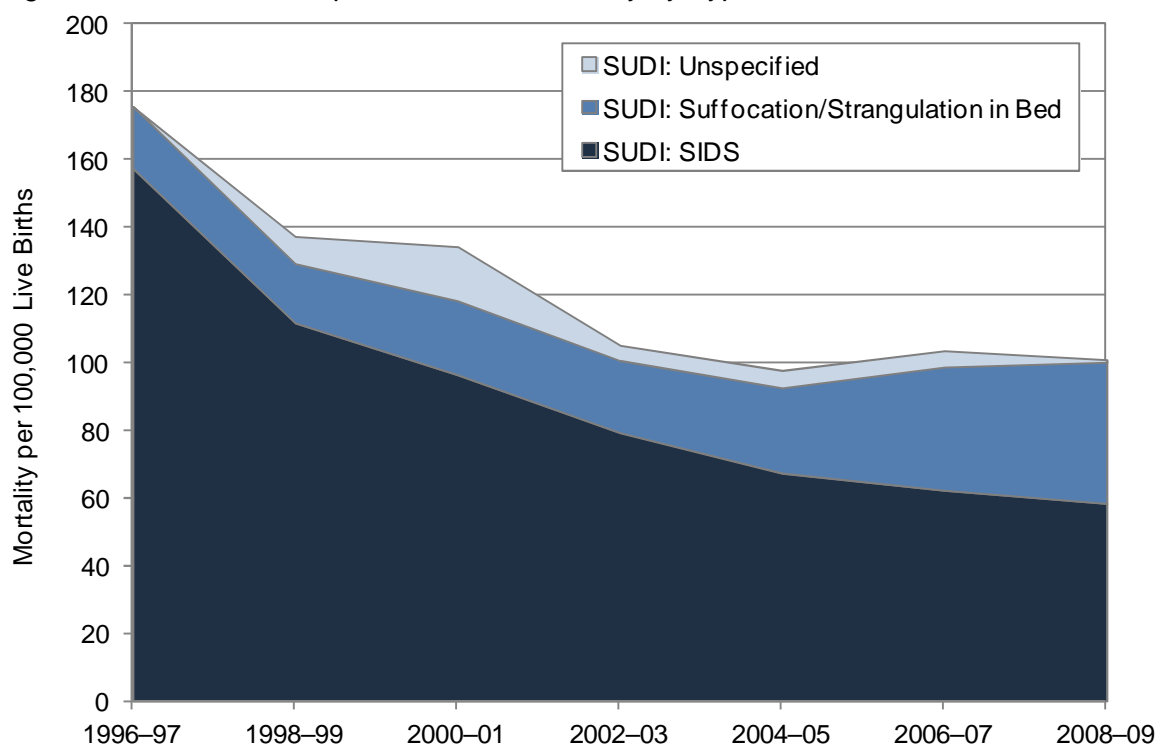
Sudden Unexpected Death in Infancy (SUDI)

New Zealand Distribution and Trends

New Zealand Trends

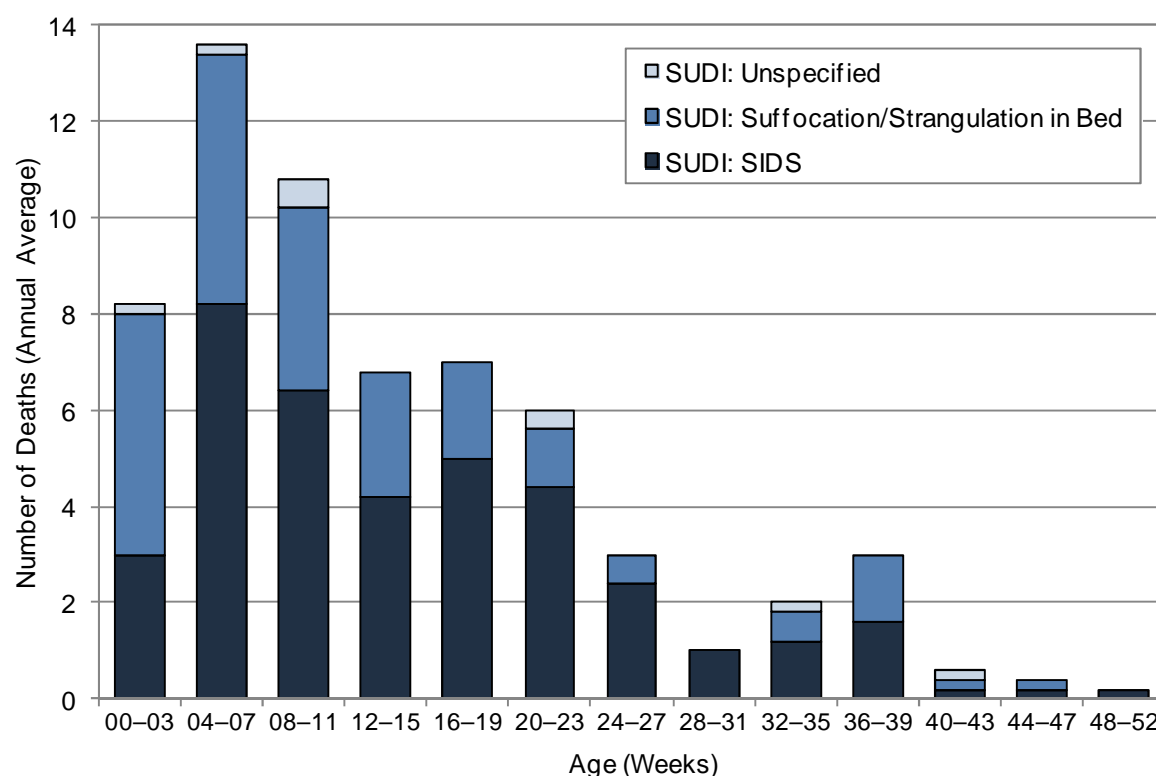
In New Zealand, SUDI rates declined during the late 1990s and early 2000s, but became more static after 2002–03. When broken down by SUDI sub-type, deaths attributed to SIDS continued to decline throughout 1996–2009, while deaths due to suffocation or strangulation in bed became more prominent as the period progressed. It is unclear however, whether this represented a diagnostic shift in the coding of SUDI, or whether the sleeping environment made an increasingly greater contribution to SUDI as the period progressed (**Figure 113**).

Figure 113. Sudden Unexpected Death in Infancy by Type, New Zealand 1996–2009



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

Figure 114. Sudden Unexpected Death in Infancy by Type and Age in Weeks, New Zealand 2005–2009



Source: National Mortality Collection

Distribution by Age

In New Zealand during 2005–2009, SUDI mortality was highest in infants 4–7 weeks, followed by those aged 8–11 weeks and then those 0–3 weeks of age. SUDI: Suffocation/Strangulation in Bed accounted for 61.0% of all SUDI deaths in those aged 0–3 weeks and 38.2% of SUDI deaths in those aged 4–7 weeks (**Figure 114**)

Distribution by Ethnicity, NZ Deprivation Index Decile and Gender

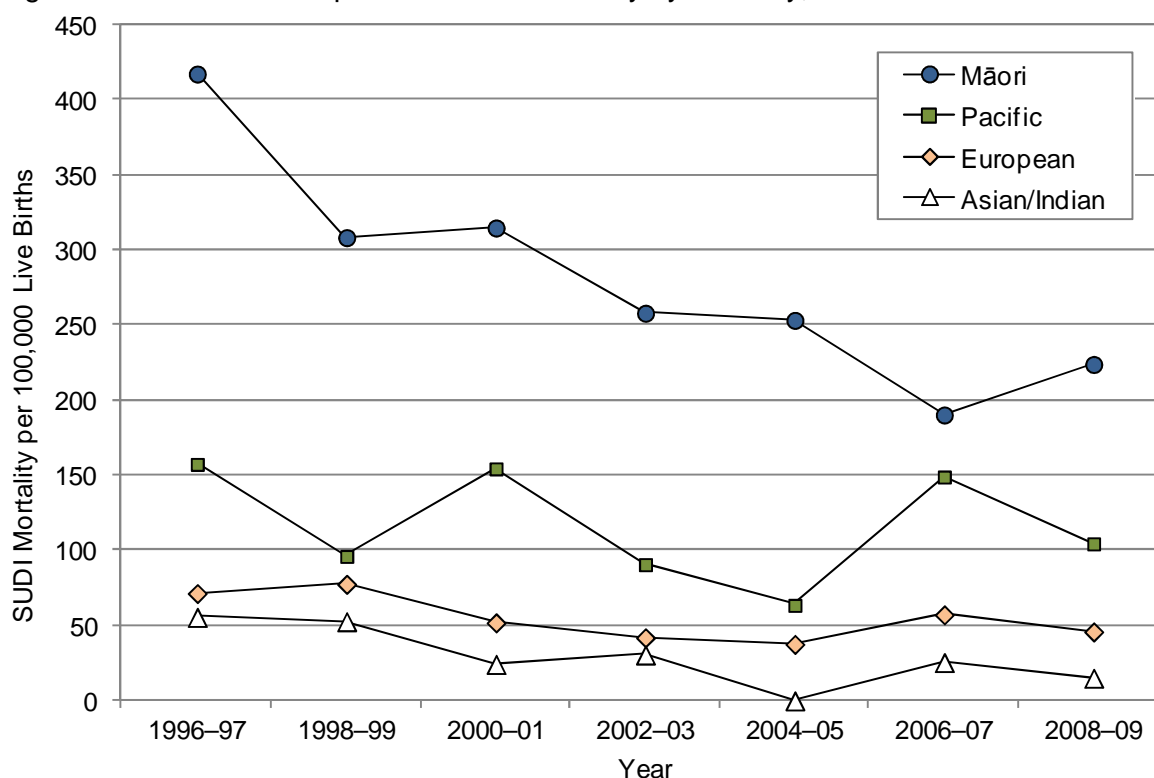
In New Zealand during 2005–2009, mortality from SUDI was *significantly* higher for Māori > Pacific > European > Asian/Indian infants and those from more deprived (NZDep deciles 7–10) areas (**Table 66**). Similar ethnic differences were seen during 1996–2009 (**Figure 115**).

Table 66. Distribution of Sudden Unexpected Death in Infancy by NZ Deprivation Index Decile, Ethnicity and Gender, New Zealand 2005–2009

Variable	Rate	RR	95% CI	Variable	Rate	RR	95% CI
Sudden Unexpected Death in Infancy (SUDI)							
NZ Deprivation Index Decile				Ethnicity			
Deciles 1–2	33.36	1.00		Asian/Indian	16.35	0.34	0.14–0.84
Deciles 3–4	53.00	1.59	0.86–2.94	European	48.29	1.00	
Deciles 5–6	58.75	1.76	0.97–3.19	Māori	211.50	4.38	3.35–5.73
Deciles 7–8	92.34	2.77	1.60–4.79	Pacific	114.72	2.38	1.61–3.50
Deciles 9–10	204.70	6.14	3.68–10.24	Gender			
				Female	89.36	1.00	
				Male	110.25	1.23	0.99–1.54

Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Note: Rates are per 100,000 live births; Rate Ratios are unadjusted; Ethnicity is Level 1 prioritised

Figure 115. Sudden Unexpected Death in Infancy by Ethnicity, New Zealand 1996–2009



Source: National Mortality Collection; Note: Ethnicity is Level 1 Prioritised

South Island Distribution and Trends

South Island vs. New Zealand

In Canterbury and Otago during 2005–2009, SUDI rates were *significantly* lower than the New Zealand rate, while in South Canterbury and Southland rates were similar to the New Zealand rate (small numbers precluded a valid analysis in Nelson Marlborough and the West Coast) (**Table 67**).

Table 67. Sudden Unexpected Death in Infancy, South Island DHBs vs. New Zealand 2005–2009

DHB/Area	Total No. Deaths 2005–2009	No. Deaths Annual Average	Rate per 100,000	Rate Ratio	95% CI
SUDI					
Nelson Marlborough	<3	s	s	s	s
South Canterbury	3	0.6	94.73	0.95	0.30–2.95
Canterbury	20	4.0	61.89	0.62	0.39–0.97
West Coast	0	0.0	–	–	–
Otago	3	0.6	29.28	0.29	0.09–0.91
Southland	8	1.6	102.11	1.02	0.51–2.06
New Zealand	313	62.6	100.08	1.00	

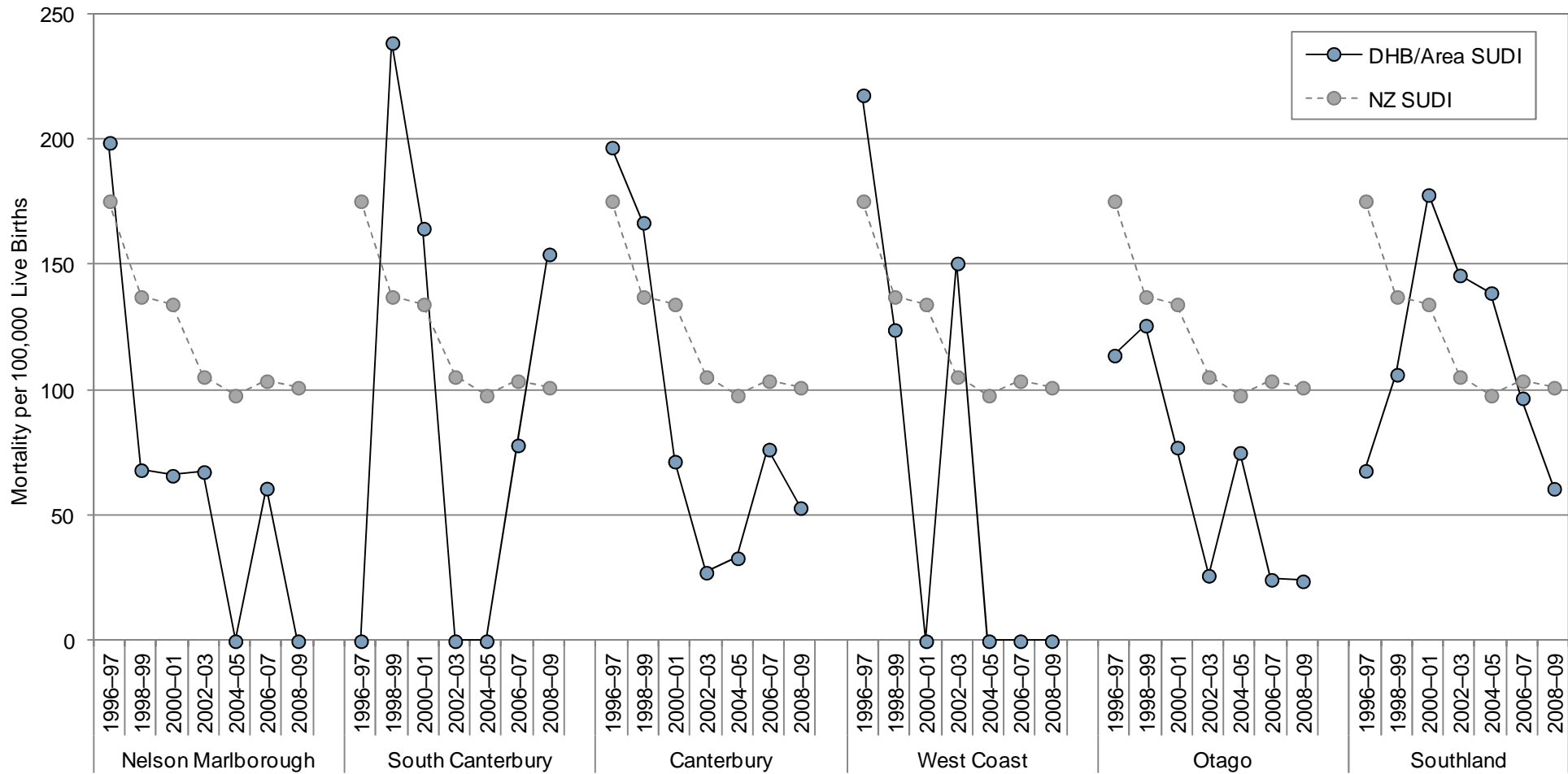
Source: Numerator: National Mortality Collection; Denominator: Birth Registration Dataset; Note: s: suppressed due to small numbers

South Island Trends

In the South Island DHBs, large year to year variations (possibly as the result of small numbers) made precise interpretation of SUDI trends difficult (**Figure 116**).



Figure 116. Sudden Unexpected Death in Infancy, South Island DHBs vs. New Zealand 1996–2009



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

Local Policy Documents and Evidence-Based Reviews Relevant to the Prevention of Sudden Unexpected Death in Infancy (SUDI)

The causes of infant mortality differ markedly with the age of the infant and reflect different causal pathways arising from conception to the first year of life. A review of interventions to address all the causes of infant mortality is beyond the scope of this review. **Table 68** below therefore provides a brief overview of local policy documents and evidence-based reviews relevant to the prevention of sudden unexpected death in infancy, a relatively discrete cause of infant mortality, but a cause that is both amenable to prevention and characterised by marked inequalities in New Zealand. Maternal smoking, a risk factor for SUDI, is addressed in **Table 33, page 197**.

In addition, social adversities in pregnancy have been linked to adverse pregnancy outcomes, including increased risk of infant mortality. The in-depth topic on **Page 276** discusses services and interventions for women experiencing multiple adversities in pregnancy.

Table 68. Local Policy Documents and Evidence-Based Reviews Relevant to the Prevention of Sudden Unexpected Death in Infancy (SUDI)

Ministry of Health Policy Documents
<p>Ministry of Health and the Child and Youth Mortality Review Committee. 2010. Preventing Sudden Unexpected Death in Infancy (SUDI): Information for parents and caregivers. https://www.healthed.govt.nz/resource/preventing-sudden-unexpected-death-infancy-sudi</p> <p>This website provides recommendations to parent and carers on reducing the risk of SUDI. Recommendations include: no smoking during pregnancy; putting babies to sleep on their backs; creating a safe sleeping environment; and breastfeeding. The recommended sleeping environment is having the baby sleeping in a cot or bassinette near the parents' bed. It advises that co-sleeping (a parent who sleeps with their baby in bed) is dangerous when: the baby's mother smoked during pregnancy; the adult in bed with the baby has been drinking, or taking drugs or medicines that might reduce their awareness; and the co-sleeping adult is excessively tired.</p>
Systematic Reviews
<p>Strehle E-M, et al. 2012. Can home monitoring reduce mortality in infants at increased risk of sudden infant death syndrome? A systematic review. <i>Acta Paediatrica</i>, 101(1), 8-13.</p> <p>This review assessed the effectiveness of home monitoring devices in the prevention of SIDS. The 11 studies identified included only one controlled trial, a feasibility study (for a proposed RCT) that compared outcomes for 100 infants born to parents who had had a previous SIDS death, allocated to weighing scales or home monitors and assessed over six months. No differences were identified. Of the 10 cohort studies, of variable quality, included in the review, two suggested that home monitoring may help to reduce SIDS rates in at risk infants. The authors concluded that there was no high-level evidence that home monitoring is useful in preventing SIDS, with the wide variety of monitoring devices used making comparison between studies difficult.</p>
<p>Hauck FR, et al. 2011. Breastfeeding and Reduced Risk of Sudden Infant Death Syndrome: A Meta-analysis. <i>Pediatrics</i>, 128(1), 103-10.</p> <p>This meta-analysis measured the association between breastfeeding and sudden infant death syndrome (SIDS), with the aim of identifying whether breastfeeding specifically lowers the risk of SIDS. Eighteen original case-control studies from Europe, North America and Australasia, were included. For infants who received any amount of breast milk for any duration, the univariable summary odds ratio (SOR) was 0.40 (95% CI 0.35 to 0.44), and the multivariable SOR was 0.55 (95% CI 0.44 to 0.69), suggesting that breastfeeding itself is protective and not merely a marker of other potentially protective factors. For any breastfeeding at two months of age or older, the univariable SOR was 0.38 (95% CI: 0.27 to 0.54). The effect was strongest for exclusive breastfeeding of any duration (univariable SOR 0.27, 95% CI 0.24 to 0.31). While the findings are based on observational studies, the consistency of the results leads the authors conclude that mothers should be recommended to breastfeed their infants as a potential way to reduce the risk of SIDS.</p>
<p>Task Force On Sudden Infant Death Syndrome. 2011. Policy Statement. SIDS and Other Sleep-Related Infant Deaths: Expansion of Recommendations for a Safe Infant Sleeping Environment. <i>Pediatrics</i>, 128 (5), 1030-39.</p> <p>Task Force on Sudden Infant Death Syndrome. 2011. Technical Report. SIDS and Other Sleep-Related Infant Deaths: Expansion of Recommendations for a Safe Infant Sleeping Environment. <i>Pediatrics</i>, 128(5), e1341-e67.</p> <p>This policy statement and background technical report from the American Academy of Pediatrics (AAP) provides an updated set of evidence-based recommendations on SIDS prevention and safe sleep environments that can reduce the risk of all sleep-related infant deaths including suffocation, asphyxia and entrapment. Recommendations include placing the baby in a supine position to sleep, using a firm sleeping surface, breastfeeding, room-sharing without bed-sharing, routine immunisations, considering the use of a pacifier, and avoiding soft bedding, overheating and exposure to tobacco smoke, alcohol and illicit drugs. The technical report provides a review on which the recommendations are based.</p>

<p>Vennemann M, et al. 2007. Do immunisations reduce the risk for SIDS? A meta-analysis. <i>Vaccine</i>, 25(26), 4875-79.</p> <p>This meta-analysis, aimed at examining the relationship between immunisation and SIDS, identified nine case-control studies, four of which were adjusted for potential confounders. The summary OR was 0.58 (95% CI 0.46 to 0.73) in the univariate analysis, suggesting that immunisations were protective, but the presence of heterogeneity made it difficult to combine these studies. The summary OR for the four studies that reported multivariate ORs was 0.54 (95% CI 0.39 to 0.76) with no evidence of heterogeneity. The authors conclude that immunisations are associated reduced risk of SIDS. A number of explanations are offered, including infection as a risk factor for SIDS, and the healthy vaccinee effect (vaccination may be avoided during illness), making the reduction in SIDS with immunisations a marker of the wellbeing of the infant, and not causally linked. It is recommended that immunisations be part of SIDS prevention campaigns.</p>
<p>Mitchell EA, et al. 2006. Should Pacifiers Be Recommended to Prevent Sudden Infant Death Syndrome? <i>Pediatrics</i>, 117(5), 1755-58.</p> <p>This report aimed to review the evidence for a reduction in the risk of SIDS with pacifier use, discuss possible mechanisms for the reduction in SIDS risk, and assess other possible effects of pacifiers on infants and children. It is reported that in New Zealand pacifier use is low overall (approximately 10%) but there is wide variation within the country from three per cent in the far south to 30% in the northern North Island. The pooled the results of 7 case-control studies and one prospective study revealed a pooled OR of 0.83 (95% CI 0.75 to 0.93) for routine pacifier use. Eight case-control studies also examined pacifier use for the last sleep, with a pooled OR of 0.48 (95% CI 0.43 to 0.54), supporting consistent evidence of a reduction in SIDS with pacifier use. Possible mechanisms for this effect are discussed. Potential negative effects were reviewed, including: a possible reduction in the duration of breastfeeding (3 RCTs, conflicting results); and an increased risk of infection, particularly otitis media, although this may result from reverse causality. The authors conclude that the evidence supports an association between pacifier use and a reduced risk of SIDS and their use should therefore not be discouraged, although they do not support active recommendation. It is suggested that discussion of pacifier use should include advice to offer a pacifier only when breastfeeding is established, after the neonatal period and that they should only be used for sleeping periods in the first year of life.</p>
<p>Hauck FR, et al. 2005. Do Pacifiers Reduce the Risk of Sudden Infant Death Syndrome? A Meta-analysis. <i>Pediatrics</i>, 116(5), e716-e23.</p> <p>This meta-analysis measured the association between pacifier use and sudden infant death syndrome (SIDS), with the aim of identifying whether pacifier use lowers the risk of SIDS. Seven case-control studies were included. The calculated summary odds ratios (SORs) identified a reduction in SIDS risk associated with pacifier use, suggesting that pacifier use is protective for SIDS. For usual pacifier use the univariate SOR was 0.90 (95% CI 0.59–0.85) and the multivariate SOR was 0.71 (95% CI 0.59–0.85). For pacifier use during the last sleep the univariate SOR was 0.47 (95% CI 0.40-0.55) and multivariate SOR was 0.39 (95% CI 0.31-0.50). The authors recommend pacifier use for infants up to 1 year of age (introduced after breastfeeding has been well established in breastfed infants). Concerns about possible adverse effects, including on breastfeeding, and otitis media, led to a further review in 2006 (see above).</p>
<p>Other Relevant Publications and Resources</p>
<p>Hauck F & Tanabe K. 2010. International Trends in Sudden Infant Death Syndrome and Other Sudden Unexpected Deaths in Infancy: Need for Better Diagnostic Standardization. <i>Current Pediatric Reviews</i>, 6(1), 95-101.</p> <p>This study compared international trends in SIDS and post neonatal mortality (PNM) since the introduction of SIDS risk reduction and safe sleep campaigns for 15 countries (including New Zealand) from 1990 to the year for which most the recent data were available (2005 to 2008). SIDS rates had declined in all countries, with reductions of over 50% for most countries. These declines are attributed to SIDS risk reduction campaigns, which achieved success primarily in reducing rates of prone sleeping among infants. The largest declines generally occurred in the first few years after initiation of national campaigns. The authors highlight the need for diagnostic accuracy in comparing trends and recommend that national and local campaigns are re-energised to continue the early successes made in reducing SIDS incidence.</p>
<p>McManus V, et al. 2010. Narratives of deprivation: Women's life stories around Māori sudden infant death syndrome. <i>Social Science & Medicine</i>, 71(3), 643-9.</p> <p>This qualitative study provides a thematic analysis of life story interviews conducted between 2002 and 2004 with nineteen Māori mothers whose infants died of SIDS. Common themes of alienation, marginalisation and exclusion and lives lived with serious deprivation within an affluent society were identified. The authors argue that constructing the risk factors as non-modifiable is unhelpful and new approaches that build on the WHO Social Determinants of Health framework are needed to address the high SIDS mortality rate among Māori babies.</p>
<p>Child and Youth Mortality Review Committee, Te Rōpū Arotake Auau Mate o te Hunga Tamariki, Taiohi. 2009. Chapter 1: Sudden Unexpected Death in Infancy (SUDI) in Fifth Report to the Minister of Health: Reporting mortality 2002–2008. Wellington: Child and Youth Mortality Review Committee. http://www.hqsc.govt.nz/assets/CYMRC/Publications/cymrc-5th-report-chp1-sudi.pdf</p> <p>This report includes an analysis of SUDI mortality data from 2003–2007, including an assessment of risk factors for SUDI, recommendations from local mortality review groups, and observations and recommendations from the Child and Youth Mortality Review Committee on how to reduce incidents of SUDI in New Zealand.</p>
<p>Hymel K. 2006. Distinguishing sudden infant death syndrome from child abuse fatalities. <i>Pediatrics</i> 118(1) 421-7.</p> <p>This clinical report from the American Academy of Pediatrics provides guidance for professionals regarding procedures to help avoid stigmatizing families of sudden infant death syndrome victims while allowing accumulation of appropriate evidence in potential cases of infanticide.</p>

Schluter PJ, et al. 2007. **Infant care practices associated with sudden infant death syndrome: findings from the Pacific Islands Families study.** Journal of Paediatrics & Child Health, 43(5), 388-93.

The Pacific Islands Families Study followed a cohort of Pacific infants born at Middlemore Hospital in 2000. Mothers (1376 in total) were interviewed about infant care practices at around six weeks after the birth of their infant. Bed sharing was found to be common (50% of infants) and mostly occurred in the parents' bed. Most infants (95%) wholly or partly shared a bedroom with their parents. The authors note that despite these practices, and the socio-economic disadvantage of many Pacific families, the rate of SIDS among Pacific families was substantially lower than the Māori SIDS rate. It is recommended that mothers should receive adequate information antenatally about the risks and benefits of room-sharing, bed-sharing and safe-sleeping practices and environments.

<http://www.hqsc.govt.nz/our-programmes/mrc/cymrc/publications-and-resources/sudi/>

This website provides links to SUDI prevention publications and resources developed by the Child and Youth Mortality Review Committee (CMYRC), a statutory committee accountable to the Health Quality and Safety Commission. Resources include safe sleeping guidelines, links to CMYRC mortality reports, and examples of DHB safe sleeping policies.

<http://www.whakawhetu.co.nz/>

Whakawhetu National SUDI Prevention for Māori (previously known as Māori SIDS) is a national kaupapa Māori organisation dedicated to reducing the rate of SUDI for Māori. The organisation provides policy advice, disseminates evidence-based information, and delivers training, education and workforce development with the aim of strengthening SUDI prevention services that engage with whānau. The website includes safe sleeping advice, news, resources and information. It provides information on the wahakura, a woven flax baby bed designed to protect baby by providing a safe sleeping space in an adult bed, and the pēpi-pod, a plastic baby bed, providing a cheaper alternative to a wahakura.

<http://www.taha.org.nz/>

TAHA Well Pacific Mother and Infant Service works collaboratively in the health sector on key areas of health and wellbeing for Pacific mothers and infants with the purpose of reducing a range of maternal and infant morbidity and mortality. The website provides links to a variety of resources, including SUDI prevention resources.

<http://www.changeforourchildren.co.nz/>

Change for our Children is a 'social innovation company' that aims to build a culture of respect for children. The website includes a variety of resources related to SUDI prevention, including information on the pēpi-pod project in Christchurch, which provides a cheap plastic baby bed that aims to create a safe sleeping space

(<http://www.changeforourchildren.co.nz/files/docs/usingpepi-podsreport.pdf>).

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

IN-DEPTH TOPIC: SERVICES AND INTERVENTIONS FOR WOMEN EXPERIENCING MULTIPLE ADVERSITIES IN PREGNANCY

Introduction

Pregnancy and the early years lay critical foundations for the health and development of a child's entire lifecourse [136,137]. Adverse social conditions during pregnancy have been linked to adverse outcomes for women and their babies, including increased risks of both maternal mortality and perinatal mortality [138,139,140]. In New Zealand, the 2012 Perinatal Mortality and Maternal Review Committee (PMMRC) report demonstrated a socioeconomic gradient in perinatal mortality: women living in the most deprived areas (NZDep quintile 5) had significantly higher rates of stillbirth and neonatal death than those in less deprived areas [138]. Perinatal mortality rates were also higher for Māori and Pacific mothers compared to European mothers. A variety of factors have been implicated in this increased risk including: poverty, unemployment, homelessness, young age, underlying mental illness, substance abuse and domestic violence; and vulnerable pregnant women may experience several such factors at once [140].

Investment in the early childhood and the prenatal period has been identified as having one of the greatest potentials to reduce health inequities [136]. In New Zealand, recent reports have called for improvements in services to address the socioeconomic and ethnic disparities in maternal and child health [137,138,141]. The Child and Youth Mortality Review Committee has recommended that families under significant social and economic stress, for example those coping with several children in difficult economic circumstances, should be identified and provided with support [141]. While it is recognised that these families may be involved with a number of agencies, the committee recommended that one agency should take the lead in coordinating services. The 2012 PMMRC report made a number of recommendations regarding identifying and addressing barriers to antenatal care for at risk women and improving services for teenage mothers [138].

Antenatal care is generally considered an effective method of improving outcomes for pregnant women and their babies, although there has been little rigorous evaluation of routine antenatal care [140,142]. Non-attendance and under-attendance at free antenatal care have been linked to adverse pregnancy outcomes including low birthweight, and fetal and neonatal deaths [143]. Barriers to accessing or engaging with antenatal care were identified as the most common contributory factor to perinatal related deaths in 2010 by the PMMRC [138]. This in-depth topic considers services and interventions for pregnant women who experience multiple adversities.

Aims and Objectives

This in-depth topic aims to review the extent to which New Zealand women are exposed to multiple adversities during pregnancy, and the impact such adversities have on their pregnancy outcomes. The evidence base for services and interventions that have been developed to address these adversities, and the poorer pregnancy outcomes they are linked to, is also reviewed, with a particular focus on meeting the needs of younger women. In addressing these aims, this in-depth topic is divided into three main sections:

1. Section one reviews a range of social adversities affecting women during pregnancy and the adverse pregnancy outcomes that have been associated with them.
2. Section two provides a brief overview of maternity services in New Zealand, including potential barriers to accessing services, the pregnancy–early childhood continuum, and some examples of local services for women experiencing adversity in pregnancy.
3. Section three reviews the evidence base for interventions that aim to address adverse social factors during pregnancy and improve pregnancy outcomes. This section starts



with a review of interventions aimed at socially disadvantaged and vulnerable women in general and then reviews interventions for a number of specific risk factors (young maternal age, alcohol, other drug and tobacco use in pregnancy, family violence and women with mental illness). The publications included in the review were identified using the search methodology outlined in **Appendix 1**, and as a consequence the content reflects interventions for which higher quality published evidence (e.g. systematic reviews of multiple studies) was available.

Adversities During Pregnancy and Pregnancy Outcome

In New Zealand a range of factors have been identified which may increase the risk of adverse outcomes for women and their young children. Family Start, an intensive support programme targeted at families vulnerable to adverse outcomes, has developed a range of referral criteria including: young parental age with additional challenges, mental health issues, family violence issues, and difficulties with drugs, alcohol or gambling [144,145]. A variety of social adversities are also identified as indicators of potential need, such as a lack of support networks, a lack of financial and material resources and frequent changes of address.

The sections which follow consider a selected group of these factors and their potential impact on pregnancy outcome. The issues reviewed are: socioeconomic deprivation, young maternal age, family violence, substance use and mental illness. The adverse pregnancy outcomes discussed in this chapter are defined in box 1. While it is recognised that this is not a comprehensive list of all adversities experienced by pregnant women and their babies, the sections which follow aim to provide an overview of some of the factors more commonly associated with poorer pregnancy outcome. Each section begins with a discussion of definitions and any available information on the prevalence of the adverse factor in the New Zealand context. The literature on the associations between the factor and birth outcomes is then reviewed, before the section concludes with a brief discussion on the pathways linking the factor with adverse pregnancy outcomes.

Box 1. Adverse pregnancy and infant outcomes [138,141,146,147,148]

Stillbirth: the death of a fetus at 20 weeks gestation or beyond, or weighing at least 400g if the gestation is unknown. Stillbirth does not include termination of pregnancy.

Fetal death: the death of a fetus at 20 weeks gestation or beyond, or weighing at least 400g if the gestation is unknown, includes stillbirth and termination of pregnancy.

Neonatal mortality: the death of any baby showing signs of life at 20 weeks gestation or beyond, or weighing at least 400g if the gestation is unknown, within the first 28 days after birth.

Perinatal mortality: fetal deaths and early neonatal deaths, within 7 days of birth, of any baby born alive or born dead at 20 weeks gestation or beyond, or weighing at least 400g if the gestation is unknown.

Preterm birth: gestational age at birth of less than 37 completed gestational weeks. Preterm birth is the leading cause of infant mortality in industrialized countries and is associated with neurocognitive, pulmonary, and ophthalmologic morbidity. Caring for preterm infants incurs substantial healthcare costs.

Low birthweight (LBW): birth weight of less than 2500 g. LBW is associated with an increased risk of neonatal morbidity and mortality, neurodevelopmental disabilities, and cardiovascular disease at adulthood.

Intra-uterine growth retardation (IUGR)/fetal growth retardation (FGR): failure to reach growth potential

Small for gestational age (SGA): birthweight below the 10th percentile using sex adjusted population growth charts (includes 'constitutionally small' babies, i.e. not growth restricted). SGA is associated with stillbirth, preterm labour and neonatal morbidity and mortality.

Sudden infant death syndrome (SIDS): the sudden death of an infant under one year of age, which is unexplained after the review of the clinical history, examination of the circumstances of death, and post-mortem examination.

Sudden Unexpected Death in Infancy (SUDI): an umbrella term that includes both explained and unexplained causes of sudden unexpected death in infants under one year of age.



Socioeconomic Deprivation

Definitions and New Zealand Distribution

Socioeconomic status, measured by indicators such as level of income, education, wealth, housing, occupation, neighbourhood deprivation and access to resources, is a key determinant of health, including the health and life chances of unborn and new born babies [136,149]. In economically developed countries such as New Zealand, deprivation is a matter of relative disadvantage, or inequalities [8]. Income inequality increased significantly in New Zealand from 1990 to 2011 [8]. There is also a significant disparity in the distribution of deprivation in New Zealand. The proportion of Māori living in very deprived areas is significantly higher than the proportion for non-Māori, and the proportion of Māori and Pacific babies born in the most deprived areas is consistently higher than for other ethnic groups [150,151].

Associations between socioeconomic deprivation and pregnancy outcomes

Children born into poverty are at increased risk of IUGR, neonatal or infant death, delayed cognitive development and poor school performance [152]. In common with other countries, perinatal mortality and other adverse pregnancy outcomes in New Zealand are linked to socioeconomic disadvantage. Women, babies and whānau/families in the most socioeconomically deprived circumstances consistently experience the worst outcomes [138,141]. In 2010 rates of stillbirth and neonatal death (see box 1 above for definitions) were significantly higher for mothers living in the most socioeconomically deprived areas (NZDep quintile 5: perinatal related death rate 13.26 per 1000) compared to those in the least deprived areas (NZDep quintile 1: 8.34 per 1000) [138]. Stillbirths and neonatal deaths were also more common among Māori and Pacific women and women under twenty years, compared to those aged 20 to 39 years [8]. Rates of SUDI also demonstrate a social gradient [153]. For example, during 2004 to 2008, the rate of SUDI among those in the most deprived areas (NZDep quintile 5) was 202.5 per 100,000, compared to 27.4 per 100,000 for those in the least deprived areas (NZDep quintile 1) (RR 7.4, 95% CI 4.21 to 13.01).

While a higher proportion of Pacific and Māori babies than European babies are born into the most deprived NZDep areas, their higher perinatal mortality rates may also reflect differing distributions of more proximal risk factors such as maternal smoking [151]. Stillbirth rates are higher for Pacific women (8.48 per 1000 births) than for European women (4.84 per 1000 births in 2007–2010) but a recent case control study found this disparity was explained by confounding factors such as high parity and maternal obesity [154]. Māori babies experience much higher rates of SUDI (223.8 per 100,000 in 2004–2008) than NZ European babies (45.1 per 100,000, RR 4.96, 95% CI 3.77–6.53) [153]. Differences in the distribution of proximal risk factors such as maternal smoking in pregnancy and bed-sharing practices may account for some of the differences seen [155]. A report published by Whakawhetu National SUDI Prevention for Māori (<http://www.whakawhetu.co.nz/>) found that Māori mothers were on average younger, less likely to access antenatal education, more likely to book late for antenatal care and more likely to receive fewer antenatal visits [156]. Understanding these different pathways to SUDI is essential in developing culturally appropriate prevention strategies.

Internationally, several studies have examined the relationship between deprivation and adverse birth outcomes. A recent meta-analysis of 28 studies found that women who lived in low income neighbourhoods had significantly higher odds of having a low birthweight infant (pooled OR 1.11, 95% CI 1.02 to 1.20) [157]. Similarly, Weightman et al. found consistent links between social deprivation and adverse birth outcomes and infant mortality in the UK [149]. This systematic review and meta-analysis of 36 prospective and retrospective observational studies with socioeconomic data and health outcomes identified an OR of 1.81 (95% CI 1.71 to 1.92) for adverse birth outcomes in the highest versus lowest area deprivation quintiles. For infant mortality, the ORs were 1.72 (95% CI 1.37 to 2.15) overall, 1.61 (95% CI 1.08 to 2.39) for neonatal mortality and 2.31 (95% CI 2.03 to 2.64) for post neonatal mortality. Significantly increased odds were also identified for stillbirth, low birthweight and prematurity. While prematurity has been linked to

deprivation in some parts of the world, this relationship was not identified in a New Zealand study, although in this study it was not possible to differentiate between spontaneous and induced preterm births [158].

Understanding the link between deprivation and adverse pregnancy outcomes

The link between socioeconomic deprivation and adverse pregnancy and subsequent child health outcomes is likely to represent the cumulative effect of individual, familial, community and societal forces [149]. Risk factors such as smoking, poor dietary habits, higher fertility, teenage pregnancy and alcohol use are associated with both socioeconomic status and adverse birth outcomes, acting as steps in the causal pathway linking deprivation and adverse pregnancy outcomes [152]. Lower socioeconomic status has also been linked to reduced access to antenatal care [143]. Barriers to accessing or engaging with care (identified as substance abuse, family violence, lack of recognition or complexity or seriousness of condition, maternal mental illness, cultural barriers, language barriers, ineligibility to access free care and 'other', which included late booking and non-attendance) were identified as the most common contributory factors to perinatal related deaths in New Zealand in 2010 [138].

Young Maternal Age

Definitions and New Zealand Distribution

New Zealand has a high teenage birth rate by OECD standards: in 2008 the number of births per 1,000 women aged 15 to 19 years was 22.05, compared to the OECD average of 16.34 per 1,000 [159,160]. Teenage pregnancy is strongly linked to social disadvantage, which acts as both a contributing factor and consequence of teenage pregnancy and parenthood [161,162,163]. Nationally, there is a clear social gradient in rates of teenage childbirth [164]. From 2006 to 2010 the teenage childbirth rate was 51 per 1000 live births among those living in the most deprived areas and 10 per 1000 live births among those in the least deprived areas (RR 5.31, 95% CI 5.03 to 5.61). The teenage birth rate also varies by ethnicity. The average annual rate of live births for women aged 15 to 19 years during 2005 to 2007 was higher for Māori (63 per 1,000 women) and Pacific (43 live births per 1,000 women) women than for European/Other (22 per 1000 women) and Asian (7 per 1,000 women) women [165]. However, these differences should be viewed in the context of the higher birth rates for Māori and Pacific women at all ages up to 30 years. It has also been suggested that young Māori women who become pregnant are less likely to have a termination of pregnancy than European women [166].

Internationally, research indicates that a combination of access to skills and services and the chance to gain the education and employment needed to succeed in society is associated with lower rates of teenage pregnancy [162]. Factors related to teenage pregnancy operate at a number of levels and include: individual factors such as self-esteem and age at first intercourse; family factors such as a mother who was pregnant as a teenager, or being in care; education factors such as truancy and lack of qualifications; community factors such as social norms related to sexual activity; and social factors such as childhood poverty, employment prospects and housing and social conditions [162]. However, the relationship between these factors is complex.

Associations between young maternal age and pregnancy outcomes

Teenage pregnancy and parenthood are linked to a variety of adverse social and health outcomes, including low birthweight, higher infant and child mortality, postnatal depression, a higher rate of childhood accidents, lower levels of education, reduced employment opportunities, longer-term welfare dependency and the intergenerational transfer of poverty [162,167,168]. In New Zealand between 2007 and 2010, teenage mothers were at higher risk of stillbirth and neonatal mortality due to preterm birth, fetal growth restriction and perinatal infection, compared to mothers aged 20 to 39 years (perinatal related mortality 14 per 1000, compared to 10.4 per 1000) [138]. A similar pattern was also seen for rates of SUDI, which were highest among mothers aged under 20 years, followed by those aged 20 to 24 years between 2004 and 2008 (RR 4.96, 95% CI 3.43 to 7.17 for women under 20 years, and RR 3.29, 95% CI 2.35 to 4.62 for women aged 20 to 24 years compared to women aged 30 to 34 years). Teenage pregnancy has also been associated



with an increase in the risk of both preterm birth and small for gestational age, however, after controlling for socioeconomic status, this association disappears for Māori women [153,168,169]. Young maternal age has also been linked to lower rates of breastfeeding [162,170]. Breastfeeding has many benefits for babies, including improved resistance to infections, lower mortality in the first year of life and reduced risk of developing type 1 and type 2 diabetes and childhood obesity, and has been linked to improved bonding and lower rates of breast and ovarian cancer in mothers [170]. Research has identified a number of common barriers to breastfeeding among teenage parents include lack of supportive social networks, pain and embarrassment about feeding in public [171].

Pregnant young people may be at increased risk of a variety of other adversities linked to poorer pregnancy outcomes, including alcohol use, smoking (see **page 187**) and inter-partner violence [172,173]. The Christchurch Health and Development Study, which has followed a cohort of 515 women born in 1977 to age 25 years, found that early motherhood (having a baby <21 years and not adopting it out) was associated with poorer mental health outcomes (depression, anxiety, suicidal ideation and suicide attempts), educational outcomes (the attainment of any qualifications, tertiary qualifications, or a university degree) and economic circumstances (welfare dependency, paid employment and family income) [174]. Young motherhood was in turn influenced by previous family circumstances (e.g. having parents without formal qualifications, low family living standards during childhood) and once these factors were taken into account, the associations between early motherhood and poorer mental health outcomes disappeared. Significant associations remained between early motherhood and poorer educational outcomes and economic circumstances at age 25. The associations between young maternal age and poorer educational outcomes and economic circumstances increase the potential for the intergenerational transfer of disadvantage. This link between educational outcomes and economic circumstances emphasises the importance of ensuring that all young mothers can realise their full educational potential to facilitate a more secure economic base for themselves and their children.

Although societal attitudes towards teenage pregnancy and parenthood are negative in many countries, such negative attitudes are not necessarily shared by all population groups living in a particular country [161]. In addition to the adverse outcomes associated with young maternal age, a number of positive outcomes have been linked to teenage parenthood, both in New Zealand and internationally [162,163]. Teenage motherhood has been linked to improved family relationships, and reductions in risk-taking and self-destructive behaviour [163]. Pihama discusses the significance and centrality of being hapū – being pregnant and giving birth to the next generation, in te Ao Māori (the Māori world) [175]. In her review of the literature she found that teenage pregnancy in general, and Māori teenage pregnancy in particular, is frequently viewed as a problem, although research with young Māori parents has found positive outcomes. Collins, in her follow up study of a group of teenage mothers, found that both the informal support networks of family and whānau, partners and peers, and the formal support of teen parent units or community based services, were important in providing social support and developing of skills [167].

Understanding the link between young maternal age and adverse pregnancy outcomes

Social disadvantage and young maternal age are closely related and it is likely that many of the causal pathways between young parenthood and adverse outcomes are linked to socioeconomic disadvantage. Internationally, the evidence is contradictory regarding whether the increased risks of adverse pregnancy outcomes are related to young age itself, or the mother's socioeconomic position [144,162]. Higher rates of adolescent conception and lower rates of termination occur in areas of socioeconomic deprivation and young women requiring maternity care are therefore more likely to come from a disadvantaged background and have associated risk factors that may independently affect maternal and perinatal morbidity and mortality [176]. Young women who have had one unintended pregnancy are vulnerable to subsequent unintended pregnancies, with the potential to perpetuate the cycle of poverty [161]. Research suggests that young women



who delay a second pregnancy by two years tend to avoid many of the negative consequences of early childbearing that can lead to chronic poverty and welfare dependence [161]. The Families Commission has identified the prevention of repeat teenage pregnancy and improving the support for teenage parents as priority areas [163].

As described above, young women who become pregnant in their teenage years are more likely to be exposed to risk factors associated with adverse pregnancy outcomes, such as smoking, and these risk factors are also linked to socioeconomic disadvantage. Studies have also suggested that young women may be less likely to access antenatal care [139]. A large Finnish study found that young maternal age was associated with under-attendance and non-attendance for free antenatal care [143]. Internationally, common barriers to antenatal care among young women, include: treatment by staff and attitude of staff; not wanting to recognise the pregnancy, embarrassment about an unplanned pregnancy or being afraid to tell parents; having social problems that are more important to focus on than healthcare; waiting times at appointments; transportation difficulties; and attending clinics with older women [139]. In New Zealand the Youth'07 Survey of 9,107 secondary school students found that students who self-reported pregnancy reported greater difficulty accessing health care (41.7%) than their pregnancy-inexperienced peers (20.6%, $p<0.001$). Barriers to access identified included concerns about privacy, uncertainty as to how to access healthcare and a lack of transport. Given the increased risks of stillbirth and neonatal death associated with young maternal age, the PMMRC has recommended that research should be undertaken to determine the best model of care for young women [138]. International research addressing this question is discussed in the final section.

Alcohol, Other Drugs and Tobacco

Definitions and New Zealand Distribution


Substance use, including alcohol, smoking and illicit drug use during pregnancy has been linked to a variety of adverse pregnancy outcomes. Alcohol use is widespread in New Zealand society and several studies have identified that while most women reduce or stop drinking alcohol during pregnancy, some continue to drink [177,178]. The 2007/2008 New Zealand Drug Use survey found that recreational drug use was common among women of childbearing age [179]. The survey found that self-reported drug (other than tobacco, alcohol and BZP party pills) use in the past 12 months peaked in the 18 to 24 age group (29.8%, 95% CI 24.2 to 35.4), that use was high among 16 to 17 year olds (27.9%, 95% CI 15.5 to 40.3) but then fell to 9.9% (95% CI 16.7 to 23.2) among 25 to 34 year olds. However, the prevalence of drug use during pregnancy is unknown. Smoking in pregnancy in New Zealand is strongly associated with socioeconomic deprivation and young maternal age, and is highest among young Māori mothers (see **page 190**). The links between substance use and adverse pregnancy outcomes are discussed below.

Associations between alcohol use in pregnancy and pregnancy outcomes

The damage caused by alcohol on the developing foetus depends on the amount of alcohol consumed, the pattern of drinking, and the stage pregnancy [180]. Alcohol use in pregnancy is linked to miscarriage, reduced fetal growth and impaired neurodevelopment, pre-term labour and stillbirth [180,181]. Fetal alcohol spectrum disorder (FASD) is an umbrella term that includes a range of effects, including structural anomalies, and behavioural and neurocognitive impairments, associated with alcohol exposure in utero [182]. Fetal Alcohol Syndrome (FAS) is the most recognisable form for FASD and is characterised by central nervous system (CNS) dysfunction, facial dysmorphology and pre and post natal growth deficiency [180]. Other forms of FASD are less well defined, making incidence and prevalence uncertain [180,182]. The incidence of FAS in the USA has been estimated to be between 0.5 and 2 per 1,000 live births [183]. Based on this incidence rate there would be 30 to 120 children with FAS born in New Zealand each year (based on approximately 60,000 live births per year).

Heavy use of alcohol during pregnancy has been linked to the development of FAS [180]. The pattern and duration of drinking appear to be important – FASD is associated with binge drinking, and women who binge drink are more likely to have children with





abnormalities than women who drink the same total amount of alcohol over an extended period of time [180]. The stage of pregnancy during which alcohol is consumed determines the cells that are affected in the developing foetus. Animal studies suggest that the first and third trimesters are critical. Evidence for the effects of lower levels of alcohol consumption on fetal growth and infant development is inconclusive and it is uncertain whether there is a clear threshold below which alcohol is non-teratogenic [180,181]. However, there is emerging evidence that low to moderate levels of drinking is associated with increased risk and the British Medical Association Board of Science has recommended that given this uncertainty, current drinking guidelines should recommend no alcohol during pregnancy [180]. New Zealand Ministry of Health guidance and the New Zealand College of Midwives consensus statement on alcohol in pregnancy support this position [184,185,186].

Associations between other drug use in pregnancy and pregnancy outcomes

In the 2007/2008 New Zealand Drug Use Survey, the prevalence of reported drug use among 16 to 17 year olds was 27.9% (95% CI 15.5 to 40.3) and fell to 9.9% (95% CI 16.7 to 23.2) among 25 to 34 year olds [179]. The use of illicit drugs (opiates and amphetamines) has been linked to a higher risk of adverse obstetric and perinatal outcomes than for women in the general population [187]. Maternal use of a variety of drugs, including opiates and non-opiates such as benzodiazepines, caffeine, alcohol, and SSRIs, during pregnancy can result in transient neonatal signs consistent with withdrawal or acute toxicity, or cause sustained signs consistent with a lasting drug effect [188]. Fetal exposure to cannabis, the illicit drug most commonly used in New Zealand, is not associated with clinically important neonatal withdrawal and does not appear to be linked to an increased risk of perinatal mortality or morbidity [188,189]. However, cannabis may have subtle effects on long-term neurobehavioral outcomes [190].

A survey of women attending an opiate treatment programme in Sydney found high rates of pregnancy and poor use of contraception among sexually active women not wanting to get pregnant [191]. Women who use substances during pregnancy are likely to face a complex array of family, social, relationship, legal, and psychiatric problems which may impair their ability to parent their new born child [192]. However, little is known about their engagement with antenatal services. A recent New Zealand and United States based case-control study found that unlike in the US, where antenatal care is not free and there is mandatory reporting of drug-using mothers to child protection services, methamphetamine use was not associated with inadequate antenatal care [193].

Understanding the link between alcohol and other drug use and adverse pregnancy outcomes

While alcohol and some illicit drugs have specific harmful effects on the developing fetus, the associations between substance misuse and pregnancy outcomes are likely to be complex. Some studies have found that women who are drug dependent have higher rates of chaotic lifestyles with increased psychosocial problems and polydrug use [192]. It has been suggested that women experiencing these adversities appear to be less likely to access or maintain contact with antenatal services [139].

Smoking in pregnancy

Tobacco smoking during pregnancy is considered the most important potentially preventable cause of a range of adverse pregnancy outcomes [92]. Smoking in pregnancy is associated with placental abruption, miscarriage, stillbirth, preterm birth and low birthweight [93,94]. It affects both fetal growth and neurodevelopment and is a significant risk factor for Sudden Infant Death Syndrome (SIDS) [95,96,97]. Smoking in pregnancy is linked to a range of other factors, including socioeconomic deprivation and young maternal age [164]. For a further discussion on tobacco use in pregnancy please see **page 187**.

Family Violence

Definitions and New Zealand Distribution

Family violence is defined as:

“a broad range of controlling behaviours commonly of a physical, sexual and/or psychological nature, which typically involve fear, intimidation and emotional deprivation. It occurs within close interpersonal relationships.” [194]

Family violence encompasses violence between any members of a family group or whānau and includes both intimate partner violence (IPV) and child maltreatment. IPV has been linked to a variety of adverse pregnancy outcomes [172]. The presence of IPV within a family increases the risk of child maltreatment [195]. Pregnancy and the contact pregnant women have with health services, represent an opportunity to identify and address IPV and intervene to prevent child maltreatment. Whether pregnancy increases the risk of IPV has been widely debated. A comprehensive review in 2004 concluded that while some hospital and clinic based studies had found that women were at higher risk of IPV during pregnancy, national and international population-based studies have identified significant increases in risk associated with pregnancy [172]. A population-based study in New Zealand identified a prevalence of IPV during pregnancy of six per cent (95% CI 4.8 to 8.0) in urban regions and nine per cent (95% CI 7.5 to 44.1) in rural regions [196]. Most women who report violence during pregnancy also report a history of violence preceding the pregnancy [197]. This section focuses primarily on IPV in pregnancy. The prevention of assault, neglect and maltreatment in children and the prevention of family violence in general is considered in more detail on **page 309** and **page 337**. The evidence base for interventions to address family violence during pregnancy is reviewed later in this section.

Associations Between Family Violence and Pregnancy Outcomes

Intimate partner violence (IPV) during pregnancy has been associated with later entry into antenatal care, adverse pregnancy outcomes, maternal behaviours such as smoking and alcohol use, and maternal physical and psychological morbidity [172,196,198]. The care sought by women during pregnancy provides an opportunity for early identification and appropriate referral of victims of IPV [199,200]. The Ministry of Health recommends that all females aged 16 years and older should be screened routinely for physical and sexual partner abuse, and screening should occur at every prenatal and post-partum visit [199]. Pregnancy is identified as a potential sign of child abuse in children and screening for abuse is therefore recommended for all those under 16 years.

Maternal exposure to domestic violence is associated with increased risk of early pregnancy loss, low birthweight and preterm birth [201,202]. In their systematic review of 30 studies with low to moderate risk of bias (5 cross-sectional, 15 prospective cohort, 6 retrospective cohort and 4 case-control studies with nearly 500,000 participants), Shah et al. found significantly increased risks of low birthweight (adjusted OR 1.53, 95% CI 1.28 to 1.82) and preterm birth (adjusted OR 1.46, 95% CI 1.27 to 1.67) among women exposed to domestic violence [201]. In a cross-sectional sample of 2,391 New Zealand women, those that reported ever having experienced intimate partner violence (IPV) were significantly more likely to report having had a miscarriage (OR 1.41 95% CI 1.10 to 1.81) or a termination of pregnancy (OR 2.49, 95% CI 1.81 to 3.42) [203]. Unplanned pregnancy was found to be more common among those that identified themselves as being victims of IPV (68.7% among victims of IPV compared to 55.1% non-victims, OR 1.78, 95% CI 1.32 to 2.40) in a cohort of Pacific women in Auckland [204].

There is significant overlap between the occurrence of child abuse and partner abuse in families and these issues cannot be addressed in isolation [199]. Addressing intimate partner violence benefits children by stopping the negative effects of the adult violence on children, and reducing the risk of physical maltreatment of children directly [195]. Pregnancy, and the contact women have with health services antenatally, represents an opportunity for the primary and secondary prevention of child maltreatment. Primary prevention may be universal, such as child birth education, or targeted at women and families at high risk. Secondary prevention involves identifying women who have had



previous involvement with child protection services with older children, for example those that have had a child removed through a care and protection intervention.

Understanding the Link Between Family Violence and Adverse Pregnancy Outcome

Violence during pregnancy can have direct physical effects, including miscarriage, fetal fractures and rupture of the uterus, and psychological effects including depression, anxiety and post-traumatic stress disorder [139]. Women exposed to violence in pregnancy are at increased risk of suicide and attempted suicide, severe mental illness, and alcohol and drug misuse, reflecting the complex nature of the relationship between exposure to this adversity, and adverse pregnancy outcomes [139].

Serious Mental Illness

Definitions and New Zealand Distribution

Women with serious mental illness, such as schizophrenia and bipolar disorder, experience higher rates of morbidity and mortality, and suboptimal access to healthcare compared to the general population [205]. Te Rau Hinengaro, the New Zealand Mental Health Survey, estimated a 12 month prevalence of serious mental disorder (defined by the level of impairment, and the presence of bipolar I disorder or substance dependence or a suicide attempt in conjunction with any disorder) of 5.4% (95% CI 4.7 to 6.1) for women, compared to 3.9% (95% CI 3.3 to 4.6) for men [206]. The prevalence was higher among younger people (16–24 years: 7.2%, 95% CI 5.7 to 9.0; 25–44 years: 5.8%, 95% CI 5.0 to 6.6; 45–64 years: 3.8%, 95% CI 3.1 to 4.5; 65 years and over: 1.1%, 95% CI 0.5 to 2.0), suggesting that serious mental disorders are more common among women of childbearing age.

Associations Between Serious Mental Illness and Pregnancy Outcomes

Women with serious mental illness appear to be at increased risk of adverse pregnancy and birth outcomes, and subsequent impaired neurodevelopment in the child [207]. A number of studies have identified increased risks of perinatal death in babies of women with psychiatric illness [205,208]. A Danish cohort study of 1.45 million live births and 7,021 stillbirths during 1973 to 1998, identified from national registers, found that risks of stillbirth and neonatal death were raised for virtually all causes of death for all of the maternal psychiatric diagnostic categories [208]. This lack of specificity suggests that the association between maternal mental illness and adverse outcomes is likely to be linked with maternal mental illness in general, rather than the illnesses themselves. Women with serious mental illness are more likely to experience a range of other risk factors for adverse outcomes, including smoking, alcohol and illicit drug use, exposure to psychotropic medication, poor compliance with folate supplementation, poor nutrition and failure to access antenatal care [205,207].

Maternal mental illness has also been linked to poorer outcomes for women. The 2012 PMMRC report found that in New Zealand between 2006 and 2010, suicide was the most frequent cause of maternal death, accounting for 13 of the 57 recorded deaths in this time period [138]. While the small number of deaths makes it difficult to draw firm conclusions, the Maternal Mortality Review Working Group (MMRWG) identified a number of common features including: a history of mental illness and contact with mental health services in the perinatal period in seven of the women who died, all of whom had experienced worsening pre-existing illness in the perinatal period; the presence of alcohol or drug use in over half the women who died; and a known history of family violence in approximately half the cases. Barriers to accessing and engaging with care was the most commonly identified contributing factor (9 of 13 cases) and a lack of coordination and information sharing between services was also identified as a contributory cause [138,209].

Understanding the Link Between Serious Mental Illness and Adverse Pregnancy Outcomes

The links between exposure to serious mental illness and adverse pregnancy outcomes are complex. Research suggests that adverse outcomes are not linked to specific mental disorders, but instead represent complex causal pathways involving exposure to a variety of risk factors linked to mental illness in general [205,207,208]. These pathways suggest a

need for multidisciplinary interventions during pregnancy that can address women's complex physical, social and mental health needs.

Adversities During Pregnancy and Pregnancy Outcome Conclusions

This section has identified a number of adverse outcomes, including increased rates of infant mortality, and poorer health and development in children, associated with adversities in pregnancy. The underlying causal pathways appear to be complex, involving exposure to a variety of risk factors, as well as poorer access to antenatal care. Adversities such as socioeconomic deprivation, family violence, alcohol and drug exposure and mental illness are linked, supporting integrated approaches that can address complex needs over approaches that address specific risk factors.

Before considering the evidence from the international literature on the effectiveness of programmes and services aimed at addressing these complex issues, the section which follows provides an overview of maternity services in New Zealand, including a brief review of issues associated with access to services, as well as examples of some local services which aim to meet the needs of women experiencing multiple adversities in pregnancy.

Maternity Services in New Zealand

This section begins with a brief overview of maternity services in New Zealand, before considering issues associated with the transition from maternity to Well Child/Tamariki Ora services. Access and uptake of antenatal services in New Zealand are then reviewed, and potential barriers to antenatal care discussed. The section then considers culturally appropriate maternity services, before concluding with a brief overview of some local antenatal and postnatal services which have been developed to meet the needs of women experiencing multiple adversities in pregnancy.

The Development of Maternity Services in New Zealand

Publicly funded maternity care in New Zealand provides free or subsidised care to all eligible pregnant women, with the aim of providing antenatal, labour and birth, and postnatal care, to ensure that the baby will be as healthy as possible [210]. The lead maternity care model of maternity services - maternity services delivered in the community by a Lead Maternity Carer (LMC), was established in the mid 1990s under Section 51 of the Health and Disability Act (1993) (now Section 88, Primary Maternity Service Notice 2007), issued in 1996, with the aim of providing continuity of care for the woman and her baby [211]. The LMC can be a midwife, obstetrician or a general practitioner with a Diploma in Obstetrics, selected by the woman to provide her lead maternity care [211]. In practice, most GPs and obstetricians do not practice as LMCs [211,212]. Primary maternity services may also be provided directly by DHBs, and the configuration of these services varies around the country.

In 2010 54,213 (84.1%) women (out of total of 64,485 women who completed a pregnancy that reached 20 weeks or more gestation and resulted in a stillborn or a liveborn baby in 2010) were registered with an LMC at the time of delivery, of whom 91.6% were registered with a midwife, 6.6% with an obstetrician, and 1.7% with a GP, suggesting that for the majority of women in New Zealand, maternity services are community-based and midwifery led [213]. Among women registered with a LMC, younger women, Māori and Pacific women and those from more deprived areas were more likely to register with a midwife than another type of practitioner. However, caution must be applied when interpreting these findings, as the cohort of women registered with a LMC are not representative of all women giving birth in New Zealand [213]. The remaining women either received care through DHB provided services or did not receive primary maternity care.

In the lead maternity care model, the LMC is responsible for providing continuity of care for women and their babies, including assessing their needs, planning their care and facilitating the provision of additional care as required, throughout the pregnancy, during labour and birth, and up to six weeks postpartum [211]. LMC midwives work in the



community to provide antenatal, birth (including accompanying women into secondary and tertiary facilities under a national access agreement set out in the Primary Maternity Services Notice 2007) and postnatal care [212]. A relationship of partnership between the LMC midwife and women aims to enhance informed decision making through shared information and negotiation [212]. The Primary Maternity Services Notice 2007 sets out the fees that will be paid to LMCs for each module of care (group of services for a phase of pregnancy). The Ministry of Health publishes guidelines for LMCs on consultations with other clinicians, transferring clinical responsibility for care to specialists and transferring care in emergencies [214]. Ministry of Health Maternity Consumer Surveys suggest that the majority of women are satisfied with their maternity care overall with 78% of women being 'very satisfied' or 'quite satisfied' and 89% being 'very satisfied' or 'quite satisfied' with the overall care provided by the their LMC in the 2011 survey [215]. Response rates for the survey were low (41%) and the results are discussed further below.

There have been several reviews of maternity services in New Zealand since 1990, which have made several recommendations, including improving the relationships and communication between providers, a need for national leadership and a maternity strategy, and the introduction of an agreed set of maternity standards [216,217]. In 2011 the Ministry of Health published the New Zealand Maternity Standards (box 2), to provide guidance for the provision of equitable, safe and high-quality maternity services; and established the New Zealand Maternity Clinical Indicators, as part of the Maternity Quality Initiative [218]. At this stage twelve clinical indicators, focused on the labour and birth period, have been developed [219].

Box 2. The New Zealand Maternity Standards [218]

Standard 1 Maternity services provide safe, high-quality services that are nationally consistent and achieve optimal health outcomes for mothers and babies.

Standard 2 Maternity services ensure a woman-centred approach that acknowledges pregnancy and childbirth as a normal life stage.

Standard 3 All women have access to a nationally consistent, comprehensive range of maternity services that are funded and provided appropriately to ensure there are no financial barriers to access for eligible women.

Guidelines on the Provision of Antenatal Care

The Ministry of Health and the New Zealand College of Midwives provide guidance on the services that should be provided by the LMC during each stage of pregnancy, labour, birth and the postnatal period [220,221]. While the frequency or timings of antenatal care is not defined, monthly visits in the first and second trimester, fortnightly visits in the third trimester and weekly visits in the final month are generally accepted [222]. The PMMRC has recommended that all women should commence maternity care before ten weeks, to enable screening to be offered, education to be given, at risk women to be identified and appropriate referrals to be made [138]. This recommendation assumes that early booking for antenatal care is associated with improved outcomes, through mechanisms such as early dating ultrasound scanning and early screening [139].

Similarly, the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) "Standards of Maternity Care in Australia and New Zealand" recommends that all pregnant women should have had their first full booking visit completed by 12 weeks of pregnancy [223]. The RANZCOG standards include a number of recommendations for developing services to ensure access, early engagement and continuing support and care for women with social factors linked to poor outcomes for mothers and babies, for example: inter-agency protocols for information sharing and a lead professional to ensure that women from disadvantaged groups have adequate support; flexible, accessible and culturally sensitive services; that women with significant drug and/or alcohol problems should receive their care from a multi-agency team; and specialist services for pregnant teenagers [223].

In the UK the 2008 Antenatal Care National Institute for Health and Clinical Excellence (NICE) guidelines recommend that the booking visit should ideally occur by ten weeks and an ultrasound scan should be offered between 10 weeks 0 days and 13 weeks



6 days to determine gestational age and to identify multiple pregnancies [224]. A schedule of ten appointments is considered adequate for nulliparous women with uncomplicated pregnancies, or seven appointments for parous women with uncomplicated pregnancies. NICE has also published a set of evidence-based guidelines on service provision for pregnant women with complex social factors (www.nice.org.uk/guidance/CG110), which are discussed in more detail below.

LMC to Well Child/Tamariki Ora transition

While early booking is encouraged to improve the quality of maternity care, the transition from maternity care to early childhood services has also been recognised as an important area. Early childhood development has a determining influence on subsequent health and opportunity for children to fulfil their potential [136,137]. Increasing investment in the early years has been identified as having one of the greatest potentials to reduce health inequities [136]. The World Health Organization has called for a continuum of care from pre-pregnancy, through pregnancy and childbirth, to the early years for mothers and children, emphasising the importance of the transition from LMC care to Well Child services [225]. This increasing international interest in integration of services is reflected in the prioritisation of service integration by the Ministry of Health [226].

In New Zealand, LMCs are responsible for ensuring that women receive a daily visit while receiving inpatient postnatal care, five to ten home visits including one within the first 24 hours of discharge from postnatal care, and a minimum of seven postnatal visits [227]. The Section 88 Maternity Notice sets out the contractual arrangements and obligations for the transfer of care of babies from the LMC to Well Child/Tamariki Ora (WC/TO) services. The LMC must give a written referral to a WC/TO provider before the end of the fourth week following birth and transfer of care must take place before the baby is six weeks old [227]. Concurrent WC/TO services can be arranged from two weeks if the baby has high needs.

The postnatal period is of critical importance, for example, in New Zealand between 2004 and 2008 SUDI mortality was highest among infants aged four to seven weeks [164]. Plunket data from July 2007 to June 2012 revealed that the proportion of Plunket children receiving their Core 1 contact (before six weeks of age) had increased from 75.5% to 83.5%, with improvements across all ethnic groups (see **page 171**). However, a Ministry of Health review of the WC/TO Framework, published in 2010, found that a range of Well Child providers indicated that there were problems with delayed referrals from LMCs in some areas [84]. As a result of this review, a pilot project was commissioned to evaluate the new needs assessment and care planning process (NACP) [84]. The NACP involves enhanced communication of information gathered during pregnancy by LMCs to WC/TO providers to help guide decisions about the need for additional contacts and referrals to other services [228]. The pilot project was completed in 2011, but as yet a report has not been published.

Culturally Appropriate Services

In New Zealand, ethnic disparities in adverse birth outcomes emphasise the need for culturally appropriate maternity services. Culturally competent care has been defined as a system of care that “acknowledges and incorporates, at all levels, the importance of culture, the assessment of cross-cultural relations, vigilance towards the dynamics that result from cultural differences, the expansion of cultural knowledge, and the adaptation of services to culturally unique needs.” [Cross, et al., 1999, cited in 229]. Durie argues that cultural competence “focuses on the capacity of the health worker to improve health status by integrating culture into the clinical context” [230]. Unequal access to healthcare is recognised as one of the underlying inequalities in health between Māori and non-Māori [231]. Barriers to healthcare among Māori include organisational barriers such as: timing and availability of services, universal Western approaches, the under-representation of Māori in the health professions, and the lack of appropriate educational and promotional material; human resource barriers such as: perceptions of non-Māori staff about Māori patients; and communication difficulties; and individual and community level barriers such as: the socioeconomic position of many Māori and affordability of healthcare; and patient



attitudes, beliefs and preferences which may make healthcare inappropriate, feared or not a priority [231].

A qualitative study examining perceptions of health and interactions with 'mainstream' health services among a group of 38 Māori women, aged between 24 and 61 years, found that women's beliefs and practices were frequently ignored and devalued by 'mainstream' health care providers, and generally not included as part of their health care [232]. Encounters with health services and health care providers were frequently problem-based with a biomedical focus, neglecting the socio-cultural dimensions influencing health and wellbeing. A systematic review in 2003 identified five interventions to improve cultural competence in healthcare systems: programmes to recruit and retain staff members who reflect the cultural diversity of the community served, use of interpreter services or bilingual providers for clients with limited English proficiency, cultural competency training for healthcare providers, the use of linguistically and culturally appropriate health education materials, and culturally specific healthcare settings [233]. However, the effectiveness of these interventions could not be established due to a lack of comparative studies, or a failure of the studies to examine outcome measures of interest, defined as: client satisfaction with care, improvements in health status, and inappropriate racial or ethnic differences in use of health services or in received and recommended treatment.

Cultural competence is integrated into the Midwifery Council of New Zealand competencies for entry into the register of midwives and a statement on cultural competence is available on their website (<http://www.midwiferycouncil.health.nz>) [234]. Other organisations in New Zealand that provide resources which may enhance the culturally appropriate provision of care for pregnant Māori and Pacific women include Nga Maia O Aotearoa Me Te Wai Pounamu (<http://www.ngamaia.co.nz/>), and TAHA, the Well Pacific Mother and Infant Service (<http://www.taha.org.nz/page/5-Home>). Nga Maia O Aotearoa Me Te Wai Pounamu was established by a group of Māori midwives in 1993, and is a national organisation that promotes mātauranga Māori, or traditional Māori knowledge, in pregnancy and childbirth. The organisation provides training for health professionals working with Māori whānau, including a tool for use by health professionals and whānau to consider aspects of Māoritanga (Māori culture) that they may wish to encompass in their care plan, and a set of guidelines for cultural competence adopted by the New College of Midwives [235,236]. TAHA aims to improve the health and wellbeing of Pacific mothers and infants during pregnancy and the first year of life. The organisation provides resources for parents and health professionals, including a training programme designed to assist health professionals to better understand SUDI and stillbirth within Pacific families, and a range of information to support health professionals who work with Pacific mothers, babies and their families.

Barriers to Maternity Services

Access to antenatal care encompasses both physical access to services, and effective communication between women and care providers to ensure that women benefit from the care they receive [139]. Good communication, between agencies and between care providers and the women in their care, is essential for effective maternity care. Women feeling awkward or ill at ease, or fearing being judged, and staff being judgemental or having a poor attitude, having a lack of knowledge of support or services available, or having a lack of understanding of issues faced by the woman, have commonly been identified as barriers to services [139]. Internationally, a 2009 review of qualitative (mainly North American) studies exploring the views of marginalised women living in high income countries who had failed to attend any antenatal care, or did so late or irregularly, identified factors influencing initial access to care and continuation of care [237]. Late pregnancy recognition, and subsequent denial or non-acceptance of pregnancy, were associated with late initial access to antenatal care. Continuing access appeared to depend on a weighing up of the perceived gains and losses, and was influenced by personal resources such as time, money and social support, as well as perceptions of quality of care, trustworthiness and cultural sensitivity of staff and feelings of mutual respect.

In New Zealand, information on factors influencing access to antenatal care is more difficult to ascertain. Since July 2007 funding changes under the new section 88 Primary Maternity Services Notice mean that DHB employed midwifery teams no longer submit claims to the Ministry of Health for their services. Information on the antenatal care received by women who access DHB midwifery services is therefore not captured in the National Maternity Collection (MAT). In the MAT during 2009 to 2010, 16% of babies born in New Zealand were born to mothers who were not registered with a LMC at the time of delivery (see **page 188**). Many of these women are likely to have accessed DHB based maternity services although some may not have accessed antenatal care at all during pregnancy. Registration with a LMC was not evenly distributed in the population. Pacific, Asian/Indian and Māori babies were significantly more likely than European babies to have mothers who were not registered with a LMC at delivery, as were the babies of younger mothers, and those from more deprived areas. There was also large variation by DHB, reflecting local organisation of services. Of those women that were registered with an LMC at the time of delivery in 2010, 58.5% had initially registered during the first trimester (before 15 weeks), while 34.2% had registered during the second trimester (15 to 28 weeks) [213]. Having registered in the first trimester was more common among European/other (70.0%) and Asian (58.0%) women than Māori (42.2%) and Pacific (32.7%) women, suggesting the Māori and Pacific women were more likely to have registered late [213]. An audit based on the PMMRC dataset of the 137 women whose babies had died result of congenital anomalies in 2010, found that 114 (83%) were seen by a health professional before 14 weeks completed gestation [238]. However, only 90 of these women (66%) actually booked with a LMC before 14 weeks.

There is however, a limited literature addressing barriers to antenatal care in New Zealand. The Maternity Consumer Survey 2011 found that over three-quarters (78%) of women who responded to the survey reported they were satisfied with the overall maternity care they received [215]. However, almost one in five women (19%) found it difficult to find a LMC to provide care for them, compared with 11% in 2002. Satisfaction among young women, and Māori and Pacific women was similar to the average satisfaction among all women. However, response rates were low (41% overall), particularly among young women (15.8% for women under 20 years of age and 21.8% for women aged 20–24) and Māori and Pacific women were under-represented. Although weighting was used to account for this under-representation, the survey remains prone to selection bias. Similarly, Low et al. found that the majority (99.1%) of mothers in the Pacific Island Family cohort study had attended at least one antenatal appointment [239]. However, 26.6% of these women initiated their antenatal care late (defined as first antenatal visit at 15 weeks or later) and 10.7% of the mothers attended fewer than the recommended number of visits (defined as at least six visits). Maternal factors associated with late initiation of antenatal care included lack of formal qualifications (OR 1.82, 95% CI 1.34 to 2.47), lack of fluency in English (OR 1.68, 95% CI 1.32 to 2.15), and not being employed before pregnancy (OR 1.74, 95% CI 1.36 to 2.22). A recent review on maternity services at Counties Manukau DHB found that many women could not access co-ordinated lead maternity care through a self-employed LMC midwife or a specific allocated DHB midwife and concluded that gaps in maternity services (including insufficient numbers of midwives offering LMC services) and a lack of knowledge about how to access care left some vulnerable women at risk of avoidable harm [240]. The review also identified that the current funding mechanism for LMC services, with set fees paid for each module of care, was a disincentive to providing care to women with complex needs.

Current Services for Vulnerable Women in New Zealand

A number of DHB and community providers provide antenatal services for women with specific needs, for example teenage pregnancy services and services for women at risk of family violence. There are very few published trials or evaluations of these services. Some examples of such services are described in box 3 below. Antenatal parent education, with a focus on young parents, is discussed in the section which follows.



Box 3. Local of examples of services for women with specific needs in pregnancy

Extended WC/TO Service for Teenage Mothers in Hawke's Bay commenced as a one year pilot in 2011, with the aim of improving the engagement of teenage mothers in the WC/TO service and better meeting their parenting needs [241]. The service provides early contact, with the addition of two antenatal visits and one early postnatal visit, and additional needs-based visits delivered in the home by a dedicated Plunket nurse. An evaluation published in June 2012 found that young women in the intervention group received an average of 9.7 postnatal contacts compared with an average of 4.0 for the control group of teenage parents. Higher rates of referrals and recommendations to other health services and agencies, breastfeeding and completed immunisations were identified in the intervention group. The qualitative component of the evaluation identified high levels of satisfaction with the service and relationships with the Plunket WC/TO nurse, as well as strong continued engagement with the service, among the nine Māori and six NZ European teenage mothers interviewed. Challenges included: sustainability of funding; importance of the nurse's personal characteristics in maintaining relationships with mothers; a need for strong organisational structures; well developed and nurtured relationships with other services, including midwives, Ministry of Social Development (MSD) and Child, Youth and Family Services (CYFS); and managing the caseload.

The National Women's Vulnerable Pregnant Women's multidisciplinary team provides a midwifery led weekly forum for midwifery, maternal mental health and health social workers to plan and coordinate clinical and social care, including statutory child protection services, for pregnant women with complex social needs [242]. A review of the team found that the increased coordination of services had resulted in outcomes such as; less (sic) traumatic uplifts of new born babies from the hospital; increasing numbers of babies remaining in their parents' care with intensive social service support in place at the time of birth; increasing numbers of babies being placed in kin care without the disruption to attachment inherent in protracted foster placements, and reduced interdisciplinary and interagency conflict.

Teen Parent Intensive Case Workers, funded through the Ministry of Social Development and provided by 18 NGO providers around the country, aim to help teen parents in high needs communities stay in education and prepare for future employment. They link teen parents and their children to services and supports including: antenatal care, housing, budgeting and parenting services, Well Child services and early childhood education; and also aim to prevent further unplanned pregnancies. An evaluation of the service in 2009 (then known as Teen Parent Service Coordinators) found that the service was well implemented and operating in accordance with the policy intent. Young parents, predominantly women aged between 14 and 19 years old, appeared to be well engaged with the service, and coordinators in all sites were working directly with young people and networking with other relevant agencies. Young parents participating in this service had been supported to access many services that were expected to improve their health, education and social outcomes. Participants in the evaluation identified a need for the service and its benefits. It was noted that many coordinators carried caseloads greater than recommended in the original policy, and therefore were not always able to focus on the most vulnerable teen parents. In Budget 2010, funding for coordinators was increased from nine to 19. For further information on teen parent intensive case workers see <http://www.familyservices.govt.nz/working-with-us/programmes-services/early-intervention/teen-parent-initiatives.html> and <http://www.msd.govt.nz/about-msd-and-our-work/newsroom/factsheets/budget/2010/teen-parents.html>

Parent Education Services

Several DHBs run pregnancy and parent education sessions aimed at young parents. An extensive literature review assessing the effectiveness of antenatal education sessions found that there was good evidence that antenatal education can improve bonding or attachment, breastfeeding rates, parenting self-efficacy and parenting knowledge [243]. The narrative review, which included 67 studies of varied methodology, found no consistent evidence of benefits in terms of nutrition, or reduction in the number of premature or low birthweight babies. It also identified that several vulnerable groups, including teenage parents, were much less likely to attend antenatal classes. An evaluation of pregnancy and parent education sessions by Nelson Marlborough DHB found that providers reported that teenagers often did not attend their classes [244]. The evaluation included a survey of parents, although only two of the 44 responses were from women aged under 20, neither of whom attended classes. No responses were received from women attending the specific 'young parents' classes funded by the DHB.

Teen Parent Units

Teenage parents are recognised to be at high risk of under-achievement in education, due to a combination of limited prior learning, social disadvantage and parenting responsibilities [245]. Educational and career development interventions have been linked to an increased number of young parents in education or training in the short-term [162]. Most of the studies failed to demonstrate longer term effects at follow up two to four years

post intervention. Engagement in education appears to be important in reducing repeat teenage pregnancy: continuous connection to the education system after the birth of a first child has been linked to a reduction in the risk of a second teenage pregnancy [163].

In New Zealand, school age pregnant women and parents are eligible to attend one of the Teen Parent Units (TPUs) located around the country. However, only a small proportion (estimated 5%) of teenage parents currently attends a TPU [246]. TPUs aim to provide educational support for young parents, for example through providing individualised education plans, a suitable environment for feeding and changing babies, help with transport and peer support. Each unit is linked to an Early Childhood Education provider to ensure accessible child care. The 2011 Education Review Office evaluation of TPUs found that units could offer individualised programmes and supportive environment, although attendance was problematic at most units [246]. Most of the students valued their time at their unit and felt they were progressing towards their goals. Many were motivated by a desire to make their children proud of them and most students achieved NCEA credits while at the TPU.

A 2006 survey of 220 teenage parents (overall response rate 49%), attending 19 of the 21 TPUs in New Zealand, found that most teenage parents attending the units were well connected to their families and felt supported within the unit. However, a number of areas of concern were also identified, including sexual health issues, nutrition and physical activity, and mental health. A more recent Families Commission report found that young parents who had access to TPUs value them highly and have aspirations and goals that they otherwise might not have [163]. The report highlighted supporting pathways into further education, training and employment as a priority area to help support teenage parents and prevent repeat pregnancies [163]. It identified that teenage parents need easy access to a range of differing educational opportunities that link to post-secondary school courses, employment or apprenticeships and affordable and accessible childcare.

Systematic Reviews and Guidelines Addressing Services for Pregnant Women Experiencing Adversity

As the previous sections have shown, New Zealand women and their families/whānau may be exposed to a range of adversities during pregnancy. Services currently exist locally to assist women and their babies during this critical period. However, recent local reviews highlight the need for the health sector to continue to identify barriers to care and effective interventions to address these barriers, as well as to prioritise antenatal care for “high needs” and vulnerable women [138,240]. In this context, there is a wealth of information in the international literature on interventions and services aimed at improving outcomes for women and their babies exposed to adversity, which is of relevance to New Zealand. However, when reviewing the information presented, the reader must remember that models of maternity care vary between countries, and thus that the utility of the findings presented should be viewed in the context of New Zealand’s LMC based model of primary maternity care.

The review of the international literature which follows is primarily based on the findings of systematic reviews and guidelines and was undertaken using the methodology outlined in **Appendix 1**. As a result of the structure of the underlying literature, it considers antenatal interventions from a number of different perspectives: with some reviews focusing on specific types of intervention, some focusing on specific population groups and some focusing on specific outcomes. The section thus begins by reviewing interventions aimed at socioeconomically disadvantaged and vulnerable women in general, before considering interventions which aim to meet the needs of the specific groups of pregnant women identified in the previous section, namely: women who use alcohol and other drugs, teenage parents, women exposed to family violence, and women experiencing mental illness in pregnancy. When reading these sections, it is important to remember that vulnerable women often have multiple needs and may experience a number of adversities, necessitating an approach that crosses population groups and requires intervention from a range of services and agencies [139].



Interventions Aimed at Socially Vulnerable Women in General

The following section reviews a range of interventions aimed at meeting the needs of socially vulnerable women more generally. While the interventions themselves vary, the common theme which unites them is the desire to provide services and supports for women experiencing social or economic adversity during pregnancy.

Provision of Social Support during Pregnancy

There is limited evidence that increasing social support during pregnancy improves birth outcomes. Hodnett et al. assessed the effectiveness of programmes offering additional social support (delivered by a professional or trained lay-person) compared with routine care, for pregnant women believed to be at high risk for giving birth to babies that were preterm and or low birthweight (less than 2500 grams) [247]. Seventeen RCTs (12,264 women) were included in the review. There was a reduction in the likelihood of antenatal hospital admission (three trials; $n = 737$; RR 0.79, 95% CI 0.68 to 0.92) and caesarean birth (nine trials; $n = 4522$; RR 0.87, 95% CI 0.78 to 0.97). However, no significant improvements in perinatal outcomes, including preterm birth (11 trials; $n = 10,429$; RR 0.92, 95% CI 0.83 to 1.01) low birthweight babies, (11 trials; $n = 8681$; RR 0.92, 95% CI 0.83 to 1.03), and perinatal mortality (11 trials, $n = 7522$; RR 0.96, 95% CI 0.74 to 1.26), were identified.

Antenatal Care

The National Perinatal Epidemiology Unit at the University of Oxford has published a series of systematic reviews focused on interventions to reduce inequalities in infant mortality [140,248,249]. Oakley et al. found insufficient high quality evidence to make firm recommendations about interventions aimed at increasing the early initiation of comprehensive antenatal care in socially disadvantaged and vulnerable women [249]. Fourteen studies were included in the review, most of which were observational cohort studies focussed on specific disadvantaged or vulnerable subgroups of the population, including teenagers and ethnic minority women. Of the 11 studies that evaluated interventions that involved outreach or other community-based services, only one (a paraprofessional home visiting intervention for pregnant teenagers) was assessed as having adequate internal validity in relation to the estimated effect on the timing of initiation of antenatal care. The evaluation reported a small but statistically significant increase in the proportion of intervention teenagers initiating antenatal care before the fourth month of pregnancy relative to both comparator groups (intervention group vs. geographical comparator group adjusted OR 1.48, 95% CI 1.32 to 1.66, intervention group vs. 'pre-intervention' comparator group adjusted OR 1.39, 95% CI 1.16 to 1.66). All five studies relating to interventions involving alternative models of clinic based antenatal care were of poor quality.

In a further review, Hollowell et al. found insufficient evidence of adequate quality to recommend routine implementation of specific antenatal programmes as a means of reducing infant mortality (or one of its three major causes: pre-term birth (PTB), congenital anomalies, and sudden infant death syndrome/sudden unexpected death in infancy) in disadvantaged or vulnerable women [140,248]. The systematic review included 36 studies, assessing comprehensive antenatal care programmes (including targeted and enhanced antenatal programmes for socioeconomically disadvantaged women without specific clinical risk factors for PTB/low birth weight (LBW) or other at risk groups), and programmes provided as an adjunct to comprehensive antenatal care (including interventions aimed at socioeconomically disadvantaged women in general and those with additional risk factors for PTB/LBW or other vulnerable/at risk groups). The overall quality of the evidence was poor, although seven interventions indicated a possible beneficial effect on PTB or on infant mortality and were deemed worthy of more rigorous evaluation. Four models of comprehensive antenatal care were considered promising including group antenatal care (where a group of 8 to 12 women meet regularly with a stable group leader, usually a midwife, for antenatal care, education and relationship building) and broad, multifaceted clinic based interventions addressing a broad range of risk factors in disadvantaged women identified as being at higher risk of PTB. The adjuncts to standard



antenatal care, including two nutritional programmes for teenagers, were considered promising.

Home Visiting

Home visiting has been identified as an intervention with potential for reducing inter-generational health inequalities [250]. A 2004 'review of reviews' published by NICE assessed the effectiveness of antenatal and post natal home-visiting programmes for improving child and maternal outcomes [250]. The authors note that home visiting encompasses a wide variety of interventions, with diverse goals, target recipients, content, theory, mode and timing of delivery. This diversity makes demonstrating effectiveness of such programmes difficult. Nine reviews were included in the report. The benefits of home-visiting programmes to parents of young children included: improvements in parenting and some child behavioural problems; improved cognitive development, especially among some sub-groups of children such as those born prematurely or born with low birth weight; a reduction in accidental injury among children; and improved detection and management of post-natal depression. There was either no evidence or inconclusive evidence for the impact of home visiting on the other outcomes, including child abuse, increased uptake of immunisation, reduced hospital admissions or maternal participation in education or in the workforce. Some of these reviews addressing interventions with particular target recipients and goals are considered individually below.

Provision of Financial Support

The association between poverty and adverse pregnancy outcomes raises the question of the value of providing financial support during pregnancy. In Europe, antenatal care has emphasised primary prevention, by providing social and financial support to all pregnant women, although this support has not been tested in RCTs [251]. In the United States, a state-level analysis examined the temporal relationships between welfare reforms and the incidence of reported and substantiated cases of maltreatment [252]. The study found that the incidence of specific types of substantiated maltreatment (physical abuse and neglect) and the number of children living in out-of-home care increased between 1990 and 1998, following reductions in state welfare benefit levels, tightening of lifetime benefit restrictions and tougher sanctions for non-compliance. The study found that higher welfare benefits to mothers were associated with fewer cases of child neglect and out of home placement. Parental employment among single-parent families was also associated with lower rates of child maltreatment.

Box 4. Key points emerging from the literature on interventions aimed at socially vulnerable women in general

- RCTs assessing the benefit of additional social supports in pregnancy have failed to demonstrate significant improvements in perinatal outcomes.
- The evidence base for interventions that aim to increase the early initiation of comprehensive antenatal care is limited with very few RCTs. One paraprofessional home visiting intervention for pregnant teenagers was associated with a statistically significant increase in the uptake of early antenatal care.
- There is a limited evidence base for specific antenatal interventions aimed at reducing infant mortality among disadvantaged groups, but group antenatal care, enhanced clinic based care for at risk women and nutritional programmes provided to teenagers as an adjunct to routine care, have shown promise.

Services for Teenage Parents

A number of studies and reviews have considered interventions aimed at supporting young parents during pregnancy and the postnatal period.

Clinical guidelines

The UK government has published guidance on providing maternity services for pregnant teenagers and young fathers [253,254]. "Getting maternity services right for pregnant teenagers and young fathers" provides a practical guide for midwives, doctors and maternity support workers and receptionists [253]. "Teenage parents: who cares? A guide



to commissioning and delivering maternity services for young parents” provides the evidence base for the guidelines [254]. It provides a review of evidence linking teenage pregnancy with poorer health outcomes for mothers and their babies, social exclusion, and higher levels of risk factors such as smoking in pregnancy, poor diet and reduced rates of breastfeeding compared to older mothers. Access to maternity care is reviewed, including delayed booking and missed appointments, and the benefits of high quality care and involving fathers in maternity care. The report summarises UK government policy and guidance. Evidence-based guidelines on designing high quality maternity services for teenage mothers and young fathers include: ensuring early and sustained access to services, providing sessions specifically tailored to young parents, a multi-agency approach ensuring clear referral pathways between agencies, prevention of repeat unplanned conception, smoking cessation and addressing alcohol and other drug use, encouragement and support for breastfeeding and addressing mental health. A variety of emerging models of care are reviewed. A framework for reviewing, planning and delivering local services is provided.

Antenatal care for young pregnant women

The NICE guidance on pregnancy and complex social factors includes a systematic review addressing service provision for young women under the age of 20 [139]. The report emphasises that young women are a diverse group, for example the needs of 14 year olds may differ from those of 19 year olds. The review examined access to antenatal services, barriers to care, maintaining contact, additional supports and information requirement for young women. Nine retrospective studies assessed the effectiveness of interventions to improve access to antenatal services. Interventions included targeted hospital based services, school based services and home visiting. The small number of studies, which were mainly based in the US, made it difficult to generalise the findings and the multifaceted nature of the interventions made it difficult to identify which components were critical in improving care, although continuity of care was supported. School-based antenatal care was not supported by the evidence. Ten qualitative studies, based in the US and UK, examined barriers to care. Key barriers to care included staff attitudes, not wanting to recognise a pregnancy or tell parents, feeling embarrassed, having other social problems, transport difficulties and age discrepancies between young women and other service users. Twenty-one, mainly American studies examined interventions aimed at improving contact with antenatal services throughout the pregnancy. Age-appropriate antenatal classes were associated with increased uptake of antenatal care.

Although some studies of home-visiting found it to be effective, some of the effects were only achieved during the pilot stage and not replicated when the programme was adopted on a wider scale. Studies assessing the effectiveness of additional consultations and support (mainly assessing comprehensive, multidisciplinary support including: antenatal care; benefits advice; health, nutrition and childcare education; counselling; home visiting; a one-to-one relationship with a key worker; a case manager to coordinate input from a range of agencies; opportunity to form friendships; opportunity to continue with education; transport to appointments; and material or financial incentives to attend) provided inconclusive evidence. None of the studies were longitudinal so the long term effects on maternal and child health are unknown. The review concludes with recommendations for healthcare providers and service organisations including: offering age-appropriate services and help with other social problems, transport to and from appointments, providing opportunities for the father to be involved, working in partnership with other agencies, providing antenatal care in a variety of settings, offering antenatal education in peer groups at the same time and location as clinic appointments.

In another review, Allen et al. sought to identify whether the way maternity care is provided affects maternal and neonatal outcomes for young women [176]. Nine studies were identified in this systematic review including one RCT, three prospective cohort studies, two comparative studies with concurrent controls, two comparative studies with historical controls, and one case series (3,971 young women). Three models of care were identified: Midwifery Group Practice (MGP), Group Antenatal Care, and Young Women's Clinic. MGP (one study) refers to a group of two to three midwives providing continuity of carer



throughout pregnancy, birth and the postpartum period. In group antenatal care (4 studies), a model developed in the USA, a group of eight to twelve women of similar gestation meet regularly at a hospital or community venue for antenatal care and education. One stable group leader, usually a midwife, facilitates discussion according to an overall session plan and a second midwife simultaneously performs antenatal clinical assessments. A Young Women's Clinic (4 studies) is a variant of standard antenatal care and consists of a community or hospital-based multidisciplinary team including obstetricians, midwives and social workers. The narrative review found that there was insufficient evidence to assess the effectiveness of a MGP model of care for young women. The Group Antenatal Care model was associated with increases in antenatal visit attendance and breastfeeding initiation, and decreases in the risk of preterm birth. A Young Women's Clinic model may also increase antenatal visit attendance and decrease the incidence of preterm birth.

Addressing barriers to maternity services among teenage mothers

Loxton et al. examined barriers to antenatal care among young women in Australia through qualitative interviews with service providers and a review of the literature [255]. Common barriers across service types included a lack of knowledge, literacy problems, cost, transport, previous negative experiences with service providers, a lack of social and family support and absence of services such as supported accommodation and child care. Barriers occurred in complex relationships with each other. The more barriers a young woman faced, and/or the more adversities she experienced, the more difficult it was for her to access services, and the more difficult it was for service providers to accommodate her needs. A wide variety of facilitators to access were identified and best practice recommendations made, including the provision of a 'one stop shop' incorporating group support, classes, referral and drop-in services for young women and providing a focal point for local service networking; peer support programmes that decreased social isolation and increased confidence among young women; healthcare services; an integrated home visiting service for multiple types of service; and education programmes. Given the complexity of young women's lives the authors advised that services should take account of individual circumstances and no single service model was recommended.

Programmes for teenage parents

In their recent Cochrane review, Barlow et al. evaluated the effectiveness of programmes for teenage parents in improving psychosocial outcomes for the parents and developmental outcomes in their children [256]. It included eight RCTs with 513 participants, providing 47 comparisons of outcome between intervention and control conditions. Statistically significant differences in favour of the intervention group were identified in 19 of these outcomes, including important infant and child outcomes such as the infant's response to the parent, the clarity of the infant's cues and the child's ability to understand and respond to language. The diversity of programmes in terms of their duration and content meant that only four of the studies could be combined in the meta-analysis. Statistically significant findings in favour of the intervention were found for: parent responsiveness to the child (standard mean difference (SMD) -0.91, 95% CI -1.52 to -0.30, $p=0.04$); infant responsiveness to mother at follow-up (SMD -0.65, 95% CI -1.25 to -0.06, $p=0.03$); and an overall measure of parent-child interactions post-intervention (SMD -0.71, 95% CI -1.31 to -0.11, $p = 0.02$), and at follow-up (SMD -0.90, 95% CI -1.51 to -0.30, $p=0.004$). The authors concluded that, due to variations in the study populations, the interventions and the measures used, there were limits to the conclusions that could be drawn, however they considered that there was some evidence that parenting programmes may be effective in improving a number of aspects of parent-child interaction.

In another study, Harden et al. systematically reviewed the literature relating to teenage pregnancy, parenthood and social exclusion, with the aims of identifying research to inform policy and practice, and assessing the effectiveness on interventions that target the social exclusion associated with teenage pregnancy and parenting [162]. The report includes an in-depth review of parenting support interventions and their effectiveness in improving social inclusion. The review included 38 studies: 18 evaluations of interventions and 20 qualitative studies of young people's views. Ten of these parenting support studies



provided sound evidence for the value of particular interventions: two looking at welfare sanctions or bonuses, four looking at the effects of educational and career development programmes, three examining holistic, multi-agency support, and one on the effects of day-care. A meta-analysis using a random effects model suggested that educational and career development interventions were associated with a 213% increase in the number of young parents in education or training in the short term (RR 3.13, 95% CI 1.49 to 6.56). Welfare sanction/bonuses programmes and day-care also had positive short term effects but none of these interventions identified long term effects. The authors concluded that the provision of day-care appeared to be the most promising approach for the prevention of repeat pregnancy.

In the same review, the qualitative research highlighted the diversity of needs and preferences among teenage parents, the struggles against negative stereotypes, the heavy reliance on family support, the continuation of problems that existed before parenthood, and the wider costs and benefits of education and employment. Three recurrent themes in the experiences of young parents were identified: dislike of school; poor material circumstances and unhappy childhoods; and low expectations for the future.

Preventing repeat teenage pregnancy

The Families Commission has identified preventing repeat teenage pregnancy as a priority area [163]. Corcoran and Pillai examined the effectiveness of secondary pregnancy prevention programmes [257]. Sixteen controlled trials were included in the meta-analysis, all conducted in the United States. Most of the studies assessed 'comprehensive' programmes which offered an array of services, including case management and referral; education about pregnancy, labour and delivery, contraception, and infant health; and individual counselling. A quarter involved home visiting. The mean age of participants was 16.75 years. At the first follow-up period at which outcome (repeat pregnancy rate) was assessed (average 19.13 months), interventions produced a 50% reduction in the odds of pregnancy compared to comparison-control conditions (random effects model OR 0.47 95% CI 0.32 to 0.70), but by second follow-up (average 31 months, 8 of 16 studies), the effect had waned (random effects model OR 0.66, 95% CI 0.43 to 1.02). No single type of intervention (home visits, school-based interventions, support groups or peer-based incentives) emerged as more effective. Similarly, a 2010 review identified a number of programme components that demonstrated some effectiveness in reducing rapid repeat pregnancy: multi-session home visiting by a nurse; a multidisciplinary youth-oriented approach; contraception teaching; easy access to services; targeting young women at antenatal and postnatal consultations in relation to their first pregnancy; combined mother/infant care; and integrated clinical and social services [161].

Box 5. Key points emerging from the literature on interventions aimed at supporting teenage parents during pregnancy and the postnatal period

- Promoting early and sustained access to services, providing sessions specifically tailored to young parents, a multi-agency approach ensuring clear referral pathways between agencies, prevention of repeat unplanned conception, smoking cessation and addressing alcohol and other drug use, encouragement and support for breastfeeding and addressing mental health problems and other social problems are recommended.
- The Group Antenatal Care model has been associated with increases in antenatal visit attendance and breastfeeding initiation, and decreases in the risk of preterm birth.
- Educational and career development interventions are associated with significant increases in the number of young parents in education or training in the short term.
- The provision of day care appears to be associated with reductions in repeat teenage pregnancy.
- Comprehensive repeat teenage pregnancy prevention programmes have been effective in trials, although the effect appears to wane. No single model emerges as the most effective.
- Parenting programmes may be effective in improving a number of aspects of parent-child interaction.

Alcohol and Other Drugs

National and international guidelines recommend that alcohol, tobacco and recreational drug use is discussed with pregnant women at first contact with a health professional, and advice given; and that this is repeated through the pregnancy [185,224,258,259]. This section discusses interventions aimed at pregnant women with alcohol and or other drug problems.

Antenatal care for women who misuse substances

The NICE guidance on pregnancy and complex social factors includes a systematic review addressing service provision for women who misuse substances [139]. The review examined access to antenatal services, barriers to care, maintaining contact, additional supports and information requirements for young women. Evidence from retrospective studies supported the use of a drug liaison midwife to case manage and coordinate care and the provision of substance misuse and support services. Common barriers were: the attitudes of staff; the lack of integrated care from different services; women's feelings of guilt about their misuse of substances and the potential effects on their baby; and women's concern about the potential involvement of children's services. Staff training was recommended to help address these barriers. No good quality evidence was identified that investigated the effects on pregnancy outcomes of providing additional consultations and support to pregnant women misusing substances, their partners and families. However, good liaison between different agencies, with good inter-agency communication and joint care planning, was recommended.

Routine screening for alcohol and other drug use

Alcohol use is widespread in society and a number of universal prevention strategies have been used, including media advertising campaigns, school and community-based programmes, warning posters, and labelling of alcoholic beverages, although the evidence-base for their effectiveness is limited [180]. Among pregnant women, a combination of verbal guidance and printed information may reduce alcohol consumption levels during pregnancy [180,260]. However, there are a number of barriers to ascertaining an accurate alcohol history, including under-reporting due to embarrassment and shame and a lack of reliable biological markers [180]. Two screening tools, the T-ACE and TWEAK questionnaires have been recommended for detecting alcohol misuse among pregnant women [259,261,262]. In prenatal settings, brief interventions have been shown to be an effective method of reducing or stopping alcohol consumption during pregnancy in women who are nondependent and who consume alcohol at low to moderate levels [263].

Interventions for alcohol and drug use in pregnancy

Interventions to improve outcomes for pregnant women with established alcohol and other drug problems have been assessed in a number of systematic reviews, but the evidence-base for effective interventions remains limited. Two Cochrane reviews, examining the effectiveness of pharmacologic interventions and psychosocial interventions aimed at improving birth and neonatal outcomes, maternal abstinence and treatment retention in pregnant women enrolled in alcohol treatment programmes, failed to identify any eligible RCTs for inclusion [264,265]. Terplan and Lui examined the effectiveness of psychosocial interventions for pregnant women enrolled in illicit drug treatment programmes on a variety of outcomes including retention in treatment and birth outcomes [266]. Nine RCTs were included in the review, with 546 participants, assessing contingency management (CM) or manual-based interventions such as motivational interviewing (MI). CM is based on the principle of positive reinforcement and uses reinforcement techniques in an attempt to modify behaviour in a positive and supportive manner. Most of the studies included applied CM in the form of monetary vouchers. CM was associated with better retention in treatment, although results could not be pooled due to heterogeneity, while MI was associated with a non-significant reduction in treatment retention (RR 0.93, 95% CI 0.81 to 1.06). There was a minimal reduction in illicit drug use with CM. Birth outcomes were only reported in two studies, which found no differences in birth or neonatal outcomes. While there is some support for CM in retaining pregnant women in treatment, the numbers are small, and it was not possible to assess the effects on obstetric and neonatal outcomes.



Integrated care for pregnant women with alcohol and drug use problems

The UK NICE guidelines for pregnant women who misuse substances (alcohol and/or other drugs) recommend that those responsible for the organisation of local antenatal services should work with other agencies that provide substance misuse services (including social care and third-sector agencies), to coordinate antenatal care [139]. Co-location of services, and joint, cross-agency care plans which include information about opiate replacement therapy and other locally available services, are suggested. A number of such integrated programmes, incorporating substance abuse treatment and pregnancy, parenting and child-related services, have been developed [267].

In their systematic reviews Niccols et al. and Milligan et al. assessed the effectiveness of such integrated programmes on parenting and child outcomes [267,268,269,270]. Milligan et al. examined the impact of integrated treatment programmes on maternal substance use [267]. Three RCTs (n=250 participants), nine quasi-experimental studies (n=2,105) and nine cohort studies (n=856) were included in the review. Compared to no treatment, integrated programmes were significantly more effective in terms of negative urine toxicology screens and reduced alcohol and drug use (2 studies) and statistically significant standardised mean differences in maternal substance use in the ten studies examining pre- and post-intervention data. However, comparison of integrated versus non-integrated programmes showed no statistically significant differences in urine toxicology or self-reported abstinence (10 studies). Niccols et al. found that limited available evidence supported the integrated programmes on parenting outcomes, although the effect size in the three RCTs comparing integrated programmes to treatment-as-usual (419 participants) that examined parenting outcomes was small [269]. Outcomes did not include maternal custody. Niccols et al. also examined the effectiveness of integrated programmes on child outcomes [268]. Thirteen studies (2 randomised trials, 3 quasi-experimental studies, 8 cohort studies; n=775 children) were included in the review. Most of the studies assessing pre-post effects on child development and emotional and behavioural functioning indicated small to large improvements following the intervention. The one quasi-experimental study and 2 RCTs that compared integrated programmes with non-integrated treatment found favourable effects for integrated treatment, although the effect sizes were small. A further meta-analysis examining the effect of integrated programmes on maternal mental health identified a small advantage in improvement in maternal mental health [270]. While the available evidence appears to support the use of integrated programmes, there is a lack of high quality studies, limiting the conclusions that can be drawn, and highlighting the need for high-quality randomised studies with larger sample sizes.

Home visiting

A recent Cochrane review found insufficient evidence to recommend the routine use of home visits for pregnant or postpartum women with a drug or alcohol problem [181]. Seven RCTs (reporting 803 mother-infant pairs) comparing home visits (mostly after birth), by community health nurses, paediatric nurses, trained counsellors, paraprofessional advocates, midwives and lay African-American women, with no home visits, were included in the review. Several studies had significant methodological limitations. Meta-analysis identified no significant differences in a wide range of outcomes including: continued illicit drug use (three studies, 384 women; RR 1.05, 95% CI 0.89 to 1.24); continued alcohol use (three studies, 379 women; RR 1.18, 95% CI 0.96 to 1.46); failure to enrol in a drug treatment programme (two studies, 211 women; RR 0.45, 95% CI 0.10 to 1.94); not breastfeeding at six months (two studies, 260 infants; RR 0.95, 95% CI 0.83 to 1.10); incomplete six-month infant vaccination schedule (two studies, 260 infants; RR 1.09, 95% CI 0.91 to 1.32); infants not in care of biological mother (two studies, 254 infants; RR 0.83, 95% CI 0.50 to 1.39); and infant death (three studies, 288 infants; RR 0.70, 95% CI 0.12 to 4.16). While individual studies identified some benefit, given the study limitations further high-quality research is required to establish whether routine home visiting should be recommended.

Maintenance treatment

A draft protocol for methadone maintenance treatment published by the Ministry of Health in 2001 identified pregnant women as a priority group for treatment [271]. At the time, New

Zealand had a number of specialist methadone in pregnancy multidisciplinary services. Methadone maintenance treatment for opiate dependent women during pregnancy has been linked to a reduction in maternal illicit opiate use and fetal exposure, enhanced compliance with antenatal care, and improved neonatal outcomes, and a potential reduction in drug-seeking behaviours, including commercial sex to raise money for drug purchases [272]. A Cochrane review assessed the effectiveness of any opioid agonist maintenance treatment alone, or in combination with psychosocial interventions, on child health status, neonatal mortality, retaining pregnant women in treatment, and reducing the use of substances [272]. Only three RCTs, involving 96 women, were identified, all of which compared methadone with other forms of maintenance treatment (buprenorphine or oral slow release morphine). No significant differences were identified in the number of women who dropped out from treatment and the use of primary substances. There was insufficient evidence to draw any conclusions about the benefits of one treatment over another.

Drug withdrawal in infants

The American Academy of Pediatrics has published a statement that includes a review of the clinical presentation of infants exposed to intrauterine drugs and the therapeutic options for treatment of withdrawal and an evidence-based guide to the management of infants that require weaning from analgesics or sedatives in hospital [188].

Box 6. Key points emerging from the literature on interventions to address alcohol and other drug use in pregnancy

- Brief interventions are effective in reducing or stopping alcohol consumption during pregnancy in women who are nondependent and who consume alcohol at low to moderate levels
- Coordination of antenatal care, drug treatment services and social services is recommended, including consideration of the co-location of such services, although there is a limited evidence base for their effects.
- There is insufficient evidence to support the use of home visits for pregnant and postpartum women with alcohol and drug problems
- There is some support for contingency management, a positive reinforcement technique usually involving monetary vouchers, in retaining women in drug treatment during pregnancy, but trials are small.

Smoking in pregnancy

Table 33 on **page 197** provides an overview of the evidence base for promoting the cessation of smoking in pregnancy. Key points identified by the research are summarised below.

Box 7. Key points emerging from the literature on interventions to address smoking in pregnancy

- There is evidence that smoking cessation interventions during pregnancy reduce the number of women smoking in pregnancy and can improve birth outcomes, supporting the implementation of smoking cessation interventions in all antenatal settings.
- Providing incentives may be the most effective intervention, but trials are small in scale.
- There is insufficient evidence to demonstrate the efficacy of nicotine replacement therapy during pregnancy.
- Trials of interventions aimed at preventing relapse, helping partners to quit or establishing smoke-free homes are inconclusive.
- Strengthening staff support and training in smoking cessation may help challenge perceptions of ineffectiveness and improve uptake of cessation services.



Family Violence

This section reviews the evidence base for interventions aimed at addressing family violence in pregnancy, while **Table 72 on Page 316** and **Table 89 on Page 341** provide a brief overview of interventions aimed at addressing child abuse and family violence in general.

Antenatal care for women who experience family violence

The NICE guidance on pregnancy and complex social factors includes a systematic review addressing service provision for women who experience intimate partner violence [139]. The review examined access to antenatal services, barriers to care, maintaining contact, additional supports and information requirements for young women. No studies were found that investigated interventions aimed at improving access to services. Common barriers to care were: women's fear of the potential involvement of social services; women's anxiety that her partner will find out she has disclosed the abuse; insufficient time for healthcare professionals to deal with the issue appropriately; and insufficient support and training for healthcare professionals in asking about domestic abuse. Two before and after studies showed that education and training for health professionals on responding to domestic abuse, and how to provide care to women who are victims of domestic abuse, were effective in improving staff attitudes. There was a lack of good quality evidence to support the benefits of any specific intervention, including counselling, outreach or use of police. However, the studies identified suggested that a combination of education, advocacy, counselling (not necessarily conducted by professional counsellors) and/or community referral increases adoption of safety behaviour and reduces the risk of domestic abuse.

Home visiting

The evidence base for home visiting interventions aimed at addressing intimate partner violence and the prevention of family violence in pregnancy is limited. Sharps et al. reviewed the evidence for perinatal home visiting with a specific focus on intimate partner violence [203]. Eight studies (4 RCTs, 2 studies linked to RCTs, one pre-post test intervention study without control group and one cross-sectional study) were identified, all of which included assessment for IPV although none of the interventions was designed to address IPV specifically. One study found that the presence of IPV limited the ability of the intervention to improve maternal and child outcomes. The interventions using paraprofessional home visitors identified difficulties communicating, responding and making appropriate referrals where IPV was identified. The effectiveness of nurse home visitors in addressing IPV was not demonstrated but lack of education and training were identified as barriers across all the studies. The authors identify a need for trials of home visiting interventions that include components addressing IPV.

Treatment

In their review of IPV treatment studies Stover et al. (see **page 343**) found limited evidence of the effectiveness of interventions on reducing repeat violence [273]. Most interventions showed minimal benefit above arrest alone, and consistent recidivism rates of approximately 30% within six months. The lowest recidivism rates were found in a trial of behavioural couples therapy (BCT), an integrated treatment that simultaneously addresses problems with substance abuse and aggression within couples (18% recidivism rate for BCT versus 43% for individual substance misuse treatment at 12-month follow-up). The review identified one antenatal clinic intervention in which 329 Hispanic victims of IPV were randomly assigned to: provision of wallet-sized resource cards; or unlimited access to supportive, nondirective counselling; or unlimited counselling plus support from a "mentor mother." Follow up at two, six, 12, and 18 months postnatally found that women who received both counselling and mentorship, and women who received the resource card only, reported less violence at two months post-delivery than the counselling-only group. However, there were no significant differences among the groups at 12 or 18 months post-delivery.

Advocacy interventions

Advocacy interventions, which aim to help abused women by providing them with information and support to facilitate access to community resources, have been assessed



in one Cochrane review [274] (see **page 342**). Intensive advocacy (12 hours or more duration) was associated with a reduction in physical abuse more than one to two years after the intervention for women already in refuges, and brief advocacy was associated with an increase in the use of safety behaviours by abused women. However, the findings for the good quality study which took place in an antenatal setting were more equivocal. Brief 30 minute sessions of advocacy were not associated with any reduction in severe abuse (measured at 16 to 34 weeks post-intervention: change-score SMD 0.09, 95% CI -0.29 to 0.46) but a significant reduction in minor abuse was observed (change-score SMD -0.45, 95% CI -0.83 to -0.07). Significant improvements in emotional abuse and postnatal depression were also observed in this Hong Kong based study. It is not known whether these benefits were sustained over time.

Prevention

Care provided to pregnant women that have lost custody of a child through a care and protection intervention represents an opportunity address the prevention of abuse of subsequent children. Kerslake Hendricks and Stevens reviewed the international literature examining what can be done to assist such families so that subsequent children are not at risk, and prevent subsequent children coming into families while parents are still addressing complex problems [275]. A companion document examined the issue from a Māori perspective, recognising that Māori children belong to whānau, hapū and iwi and responsibility for raising children is shared beyond the immediate family [276]. No studies assessing interventions during pregnancy were identified in the review. Two studies identified an association between a lack of antenatal care and children being removed from their parents but were unable to identify whether antenatal care was associated with the prevention of initial or repeat maltreat. Overall the review found that becoming aware of subsequent children entering families where children have previously been removed is challenging. No evidence was identified to demonstrate the effectiveness of systems to improve identification and referral pathways, including alert systems, mandatory reporting, improved interagency relationships and information sharing, and public and professional education. One small-scale study focusing on families who had previously had children removed found that neglect was a key characteristic but further research on identifying and addressing neglect is needed. While the evidence base for interventions was mixed the report makes a number of recommendations regarding effective practice, including multiagency assessments, tailored interventions to meet individual family needs, and multi-component programmes that address parenting issues and systemic problems such as housing and poverty. The review recommends that engaging more fully with extended family and communities to support at-risk families, including during the prenatal period, should be considered. The authors suggest that more information about the reasons why initial and subsequent children have been removed would be useful to help develop and target assistance for these families and further research on effective interventions is needed.

Similarly, in their 'review of reviews' Bull et al. found that review-level studies of home visiting aimed at prevention of child abuse presented an incomplete and complex picture [250]. Where positive effects have been found, they tended to be in measures of parenting rather than in direct measures of abuse. Methodological problems with measuring child abuse in the trials presented a serious risk of outcome report and surveillance bias, threatening the validity of studies. A meta-analysis (including 19 controlled studies) published in 1999 found that universal, population based early intervention home visiting programmes were likely to be more effective in the prevention of maltreatment than screening-based programmes [277]. A further review published in 2009 assessed the effectiveness of early childhood interventions in the primary prevention of child maltreatment [278]. Fifteen controlled studies assessing 14 programmes, completed from 1990 to 2007, were included. Most of the programmes intervened from birth to age three (seven programmes began antenatally for some participants and two began antenatally for all participants) through home visits (10 interventions), parent education classes, or the provision of health services. Most of the studies evaluated effects during or immediately after the intervention, although two (Nurse–Family Partnership (NFP) and Child Parent



Centers (CPC) included long term follow-up of 15 and 17 years. The weighted average effect size of programme participation was a 2.9 percentage-point reduction in maltreatment (6.6% vs. 9.5%). Five programmes showed significant reductions in substantiated rates of child maltreatment, and three provided strong evidence of preventive effects (the Parent Education Program, NFP and CPC). Common elements of the effective programmes included implementation by professional staff, relatively high dosage and intensity, and comprehensiveness of scope. The authors conclude that longer term studies of a variety of intervention types are needed.

Box 8. Key points emerging from the literature on interventions to address family violence in pregnancy

- There are few trials of interventions aimed at addressing intimate partner violence or family violence in pregnancy.
- Studies suggest that interventions aimed at reducing child maltreatment should also be able to address intimate partner violence.
- Advocacy interventions may help women in abusive relationships but the evidence base for interventions in pregnancy is limited
- Integrating substance abuse treatments with family violence interventions may improve outcomes.

Mental Health Services for Pregnant Women

The Ministry of Health has published guidance for DHBs and other health planners, funders and providers of perinatal and infant mental health and alcohol and other drug (AOD) services, on ways to address the mental health and AOD needs of mothers and infants [279]. A range of international guidelines and reviews is also available. The key publications in this area are briefly reviewed below. Please see **page 379** for a discussion of infant mental health.

Clinical guidelines

NICE has published evidence-based guidance on clinical management and service provision for antenatal and postnatal mental health [280]. The recommendations cover prediction and detection; rapid access to psychological treatments (within 1 month of initial assessment, and no longer than 3 months afterwards) due to the changing risk-benefit ratio of psychotropic medication in pregnancy; explaining risks; managing depression; and the establishment of clinical networks providing specialist multidisciplinary perinatal services. The use of psychotropic drugs during pregnancy and the postnatal period is reviewed and guidance is provided on the management of specific disorders in pregnancy.

The Western Australian Department of Health has also published guidance on caring for women with mental illness in pregnancy [207]. The report provides a framework aimed at assisting mental health clinicians to manage the reproductive and pregnancy needs of these women, focussing on factors amenable to intervention such as early and ongoing compliance with antenatal care attendance, smoking moderation or cessation, nutritional advice and links to appropriate support services at the earliest opportunity. It encourages mental health clinicians to be 'client advocates' by initiating referrals to appropriate antenatal and/or family planning services.

Managing mental illness in pregnancy

Several systematic reviews have also addressed the management of mental illness in pregnancy, although the very small number of trials identified makes the results inconclusive. Dennis et al. assessed the effects, on mothers and their families, of psychosocial and psychological interventions compared with usual antepartum care in the treatment of antenatal depression [281]. Only one trial, involving 38 outpatient antenatal women, was included in the review. While interpersonal psychotherapy, compared to a parenting education programme, was associated with a reduction in the risk of depressive symptomatology immediately post-treatment, the very small number of participants means that is not possible to draw conclusions or make specific recommendations. Dennis and Allen examined the effectiveness of non-pharmacological/psychosocial/psychological

interventions to treat antenatal depression, which again included only one trial [282]. This three-armed RCT, incorporating 61 outpatient antenatal women compared maternal massage and acupuncture. No significant differences were identified between the treatment arms immediately post-treatment or at 10 weeks postpartum.

Psychosocial assessment

In their Cochrane review, Austin et al. examined the impact of antenatal psychosocial assessment on perinatal mental health morbidity [283]. Two RCTs met the inclusion criteria for the review. One study reported a RCT of 600 women identified as at significant risk (on the basis of a set of psychosocial risk items) before being allocated antenatally to either: the “intervention”, consisting of an Edinburgh Depression Scale (EDS) and a discussion of their likely risk of postnatal depression based on their EDS score, an information booklet about postnatal depression and available local resources, and a letter sent back to the referring GP and Child Health Nurse, advising of their likely risk of postnatal depression; or “standard care”, including midwifery case management and referral to social work or psychiatry as required. Follow up at four months postpartum using the EDS found no significant differences (RR 0.86, 95% CI 0.61 to 1.21). A large loss to follow up (at least 27.1%) may have biased the results. The second study, focussed on providers, reported a cluster RCT of 60 providers comparing the presence of psychosocial risk factors in the early postnatal period in two groups of women: those with an antenatal health care provider administering the Antenatal Psychosocial Health Assessment (ALPHA), and those receiving “usual care”. The providers who assessed psychosocial factors were more likely than those giving routine care to identify psychosocial concerns and to rate the level of concern as high and to detect concerns about family violence, however, none of these differences was statistically significant. The trial did not look at the development of anxiety or depression in these women. The authors concluded that while the use of an antenatal psychosocial assessment may increase the clinician's awareness of psychosocial risk, neither of these small studies provided sufficient evidence that routine antenatal psychosocial assessment by itself leads to improved perinatal mental health outcomes. Further research, which includes assessment of the longer term outcomes for the both mother and family, is required.

Psychosocial and psychological interventions

Dennis et al. included 15 RCTs, involving over 6,700 women in their review assessing the effectiveness of psychosocial and psychological interventions compared with usual antepartum, intrapartum, or postpartum care to reduce the risk of developing postpartum depression [284]. Overall, women who received a psychosocial intervention were equally likely to develop postpartum depression as those receiving standard care (RR 0.81, 95% CI 0.65 to 1.02). The provision of intensive postpartum support involving home visits provided by public health nurses or midwives appeared promising (2 trials, RR 0.68, 95% CI 0.55 to 0.84) and identifying mothers ‘at-risk’ was associated with a significant reduction in postpartum depression (7 trials, RR 0.67, 95% CI 0.51 to 0.89). Interventions with only a postnatal component appeared to be more beneficial (10 trials, RR 0.76, 95% CI 0.58 to 0.98) than interventions that also incorporated an antenatal component. While individually-based interventions may be more effective (11 trials, RR 0.76, 95% CI 0.59 to 1.00) than those that are group-based, women who received multiple-contact intervention were just as likely to experience postpartum depression as those who received a single-contact intervention. The authors conclude that while overall psychosocial interventions do not reduce the numbers of women who develop postpartum depression, the provision of intensive, professionally-based postpartum support appears promising.

Box 9. Key points emerging from the literature on interventions aimed at supporting women with mental illness in pregnancy

- UK and Australian guidelines have addressed caring for women with mental illness during pregnancy. Specialist multidisciplinary services involving maternity services, mental health services and community services are recommended.
- The small number of trials assessing the management of mental illness in pregnancy makes it difficult to draw conclusions.



- Antenatal psychosocial assessments, while improving awareness of psychosocial problems, have not been linked to improved outcomes.
- Overall, psychosocial interventions aimed at reducing the risk of developing postnatal depression do not reduce the risk of postnatal depression. However, postnatal interventions for at risk women may be more effective.

Conclusions

Being exposed to a range of social adversities during pregnancy is associated with a variety of adverse pregnancy outcomes which can affect the health and longer term development of the child. New Zealand has clear social gradients in a number of adverse pregnancy outcomes including fetal and infant deaths and babies being born small for gestational age. Ethnic disparities persist, and young women are also at increased risk of some adverse outcomes when compared to older women. However, New Zealand has a limited evidence base concerning effective interventions, and the barriers to antenatal care that need to be overcome, in order to address these disparities. The information that is available suggests that some women do not access antenatal care, or that they access care late, that some women struggle to find a midwife, and that issues remain with the transition from LMC care to early childhood services.

High quality maternity care, with early booking and good continuity of care through the pregnancy to early childhood however, is widely recognised as being important in improving outcomes for women and their babies [139]. Internationally, a large number of reviews and guidelines have examined the effectiveness of interventions aimed at meeting the needs of pregnant women experiencing adversity. Although services offered in pregnancy are unlikely to be powerful enough to overcome the cumulative effects of a lifetime lived with multiple social adversities, a number of interventions show promise in improving outcomes for vulnerable pregnant women and their babies [247]. The review above suggests that these may include:

- Group antenatal care for socioeconomically disadvantaged women and young women, in which groups of eight to 12 women meet regularly with a stable group leader, usually a midwife, for antenatal care, education and relationship building.
- For young women: multi-agency approaches targeted at young parents; nutritional programmes as an adjuncts to routine care; educational and career development interventions; parenting programmes; and the provision of accessible child care.
- For women who use alcohol and/or other drugs during pregnancy coordination and co-location of antenatal care, drug treatment services and social services; brief interventions in pregnant women who are not dependent on alcohol or consume alcohol at low to moderate levels; and smoking cessation interventions.
- For women exposed to family violence: integration of substance misuse treatment; advocacy interventions; and staff training.

However, a number of interventions were not supported by the current literature, including:

- The provision of additional social supports with the aim of improving pregnancy outcomes
- Home visits for pregnant or postpartum women with alcohol and/or other drug problems
- Nicotine replacement therapy in pregnancy
- Antenatal psychosocial interventions aimed at reducing the risk of postnatal depression.

In Conclusion

While it is hoped that the information presented above will provide a useful starting point for those planning services for pregnant women and their babies, it is likely that further local research is required to ensure that current and future services best meet the needs of women experiencing multiple adversities in pregnancy. Internationally, research has suggested that non-threatening, non-judgemental antenatal services run by culturally sensitive staff are essential in improving access [237]. In New Zealand, the persistence of ethnic inequalities in pregnancy outcome emphasises the importance of ensuring such culturally appropriate services. Finally, a clear understanding of barriers in access to care and recognition of the influence of differing proximal risk pathways is required, if we are to develop antenatal services that that can help to reduce inequalities in pregnancy and child health outcomes in New Zealand.



SAFETY AND FAMILY VIOLENCE



INJURIES ARISING FROM THE ASSAULT, NEGLECT OR MALTREATMENT OF CHILDREN

Introduction

Child maltreatment has been defined as any act of commission or omission by a parent or other caregiver that results in harm, potential for harm, or threat of harm to a child [285]. It includes neglect, physical, sexual and emotional abuse, and fabricated or induced illness, and is linked to harmful short-term and long-term effects [286]. Physical abuse can result in disability and death.

The psychological effects of maltreatment, which can persist into adulthood, include anxiety, depression, substance misuse, and self-destructive, oppositional or antisocial behaviours. In adulthood, childhood exposure to maltreatment has been linked to difficulties in forming or sustaining close relationships, sustaining employment and parenting capacity. There is significant overlap between the occurrence of child abuse and partner abuse in families and these issues cannot be addressed in isolation [199].

Child maltreatment is associated with a complex interaction of predisposing, perpetuating and precipitating risk factors [195]. Predisposing factors relate to the parent or caregivers early history and include parental exposure to a violent or abusive environment as a child. Perpetuating factors include the wider social context, such as poor housing and overcrowding, socioeconomic inequality, social and cultural norms that promote violence and physical punishment of children, and social isolation; the family context, such as unintended pregnancy, lack of attachment, large family size, financial deprivation, and intimate partner conflict; parent or caregiver characteristics, such as alcohol and substance abuse, mental health problems, and poor parenting skills; the characteristics and behaviour of the child, such as being unwanted, disabled or high needs. Precipitating factors are events that directly trigger abuse, including incessant crying, soiling, aggressiveness by the child, or a crisis event for the parent.

A UNICEF report on child maltreatment deaths, from 1994 to 1998, placed New Zealand near the bottom for deaths in the OECD, at number 24 out of 27 countries [287]. The mortality rate for New Zealand was 1.2 deaths per 100,000 children under the age of 15 years, compared to the OECD median of 0.6 deaths per 100,000 children. A recent study published in the *Lancet* found no clear evidence of a decrease in child maltreatment in New Zealand over the past two decades [288]. Between 2006 and 2010 there were 36 deaths due to assault among children aged 28 days to 14 years [289]. Between 2006 and 2010 there were 13.9 per 100,000 hospital admissions for injuries arising from assault, neglect or maltreatment of girls aged 0 to 14 years, and 24.3 per 100,000 for boys [153]. The rate of hospitalisation increased with increasing socioeconomic deprivation (RR 5.59, 95% CI 4.22–7.41 for NZDep deciles 9–10 vs. deciles 1–2), with rates of hospitalisation for Māori (39.1 per 100,000) and Pacific children (24.4 per 100,000) being significantly higher than for NZ European children (11.8 per 100,000).

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



Data Source and Methods

Definition

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

Data Source

1. Hospital Admissions

Numerator: National Minimum Dataset: Hospital admissions for children (0–14 years) with a primary diagnosis of injury (ICD-10-AM S00–T79) and an external cause code of intentional injury (ICD-10-AM X85–Y09) in any of the first 10 External Cause codes. As outlined in **Appendix 3**, in order to ensure comparability over time, all cases with an Emergency Department Specialty Code (M05–M08) on discharge were excluded.

Denominator: NZ Statistics NZ Estimated Resident Population (projected from 2007)

2. Mortality

Numerator: National Mortality Collection: Deaths in children (0–14 years) with a clinical code (cause of death) of Intentional Injury (ICD-10-AM X85–Y09).

Denominator: NZ Statistics NZ Estimated Resident Population (projected from 2007)

Interpretation

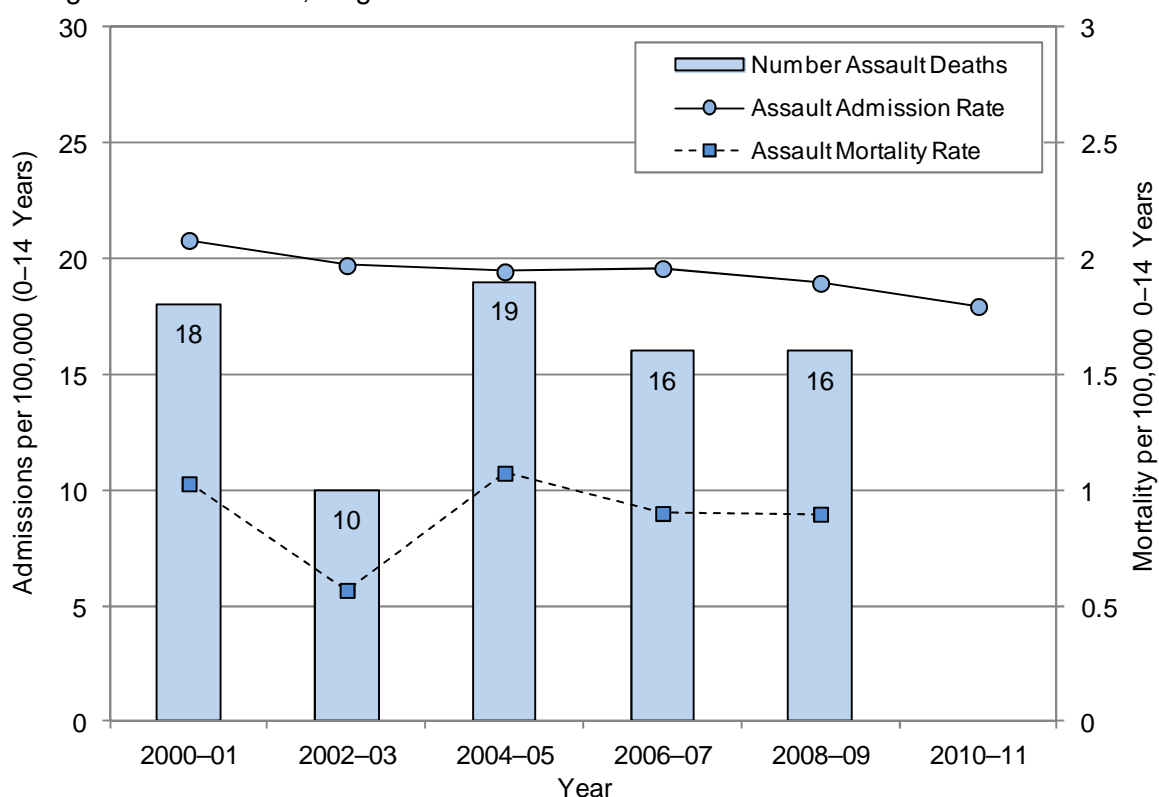
The limitations of the National Minimum Dataset are discussed at length in **Appendix 3**. The reader is urged to review this Appendix before interpreting any trends based on hospital admission data.

New Zealand Distribution and Trends

New Zealand Trends

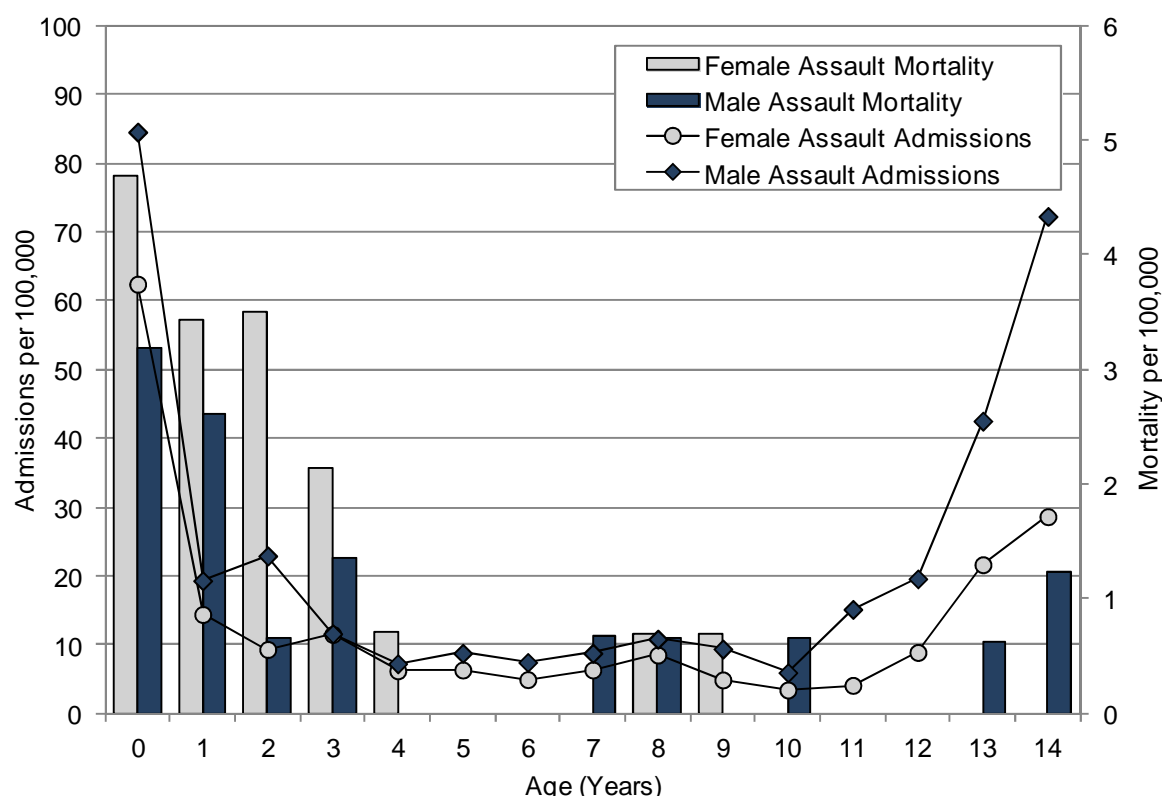
In New Zealand during 2000–2011, hospital admissions for injuries arising from the assault, neglect or maltreatment of children declined gradually, while mortality during 2000–2009 remained relatively static. On average during 2000–2009, eight children per year died as a result of injuries arising from assault, neglect or maltreatment (**Figure 117**).

Figure 117. Hospital Admissions (2000–2011) and Deaths (2000–2009) due to Injuries Arising from the Assault, Neglect or Maltreatment of New Zealand Children 0–14 Years



Source: Numerator: Admissions: National Minimum Dataset; Mortality: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: Death Numbers are per two year period

Figure 118. Hospital Admissions (2007–2011) and Deaths (2005–2009) due to Injuries Arising from the Assault, Neglect or Maltreatment of New Zealand Children by Age and Gender



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

New Zealand Distribution by Age and Gender

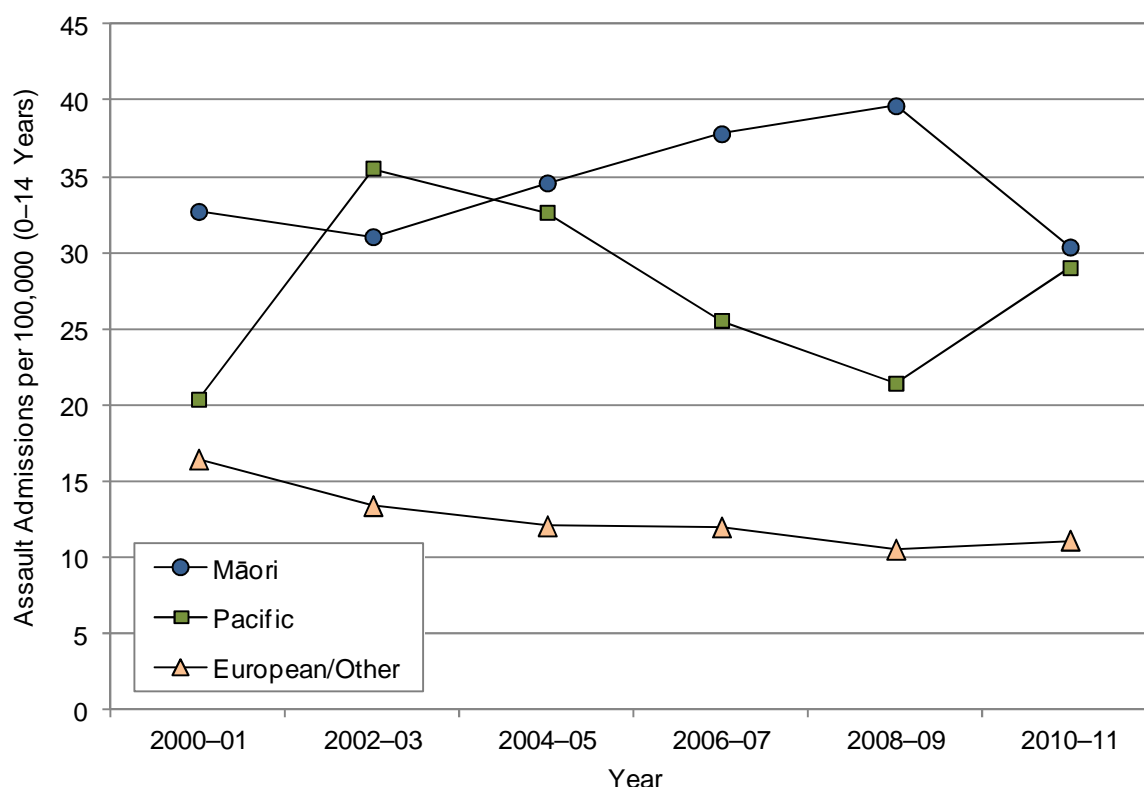
In New Zealand during 2007–2011, hospital admissions for injuries arising from the assault, neglect or maltreatment of children exhibited a U-shaped distribution with age, with rates being higher for infants less than one year and those over eleven years of age. In contrast, mortality was highest for infants less than one year, followed by those aged one and two years. While the gender balance for admissions was relatively even during infancy and early childhood, admissions for males became more predominant as adolescence approached (**Figure 118**).

New Zealand Trends by Ethnicity

In New Zealand during 2000–2011, hospital admissions for injuries arising from assault, neglect or maltreatment were consistently higher for Māori and Pacific children than for European/Other children. While rates for European/Other children declined during this period, rates for Māori children increased during the early to mid 2000s, but declined during 2010–2011. In contrast, admissions for Pacific children declined during the early to mid 2000s, but increased during 2010–2011 (**Figure 119**).



Figure 119. Hospital Admissions for Injuries Arising from the Assault, Neglect or Maltreatment of Children 0–14 Years by Ethnicity, New Zealand 2000–2011



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: Ethnicity is Level 1 Prioritised

Table 69. Hospital Admissions for Injuries Arising from the Assault, Neglect or Maltreatment of Children 0–14 Years by Ethnicity and Gender, New Zealand 2007–2011

Assault, Neglect or Maltreatment Admissions							
Children 0–14 Years							
Variable	Rate	RR	95% CI	Variable	Rate	RR	95% CI
European/Other	11.13	1.00		Female	13.80	1.00	
Māori	36.03	3.24	2.80–3.75	Male	23.64	1.71	1.49–1.97
Pacific	25.18	2.26	1.83–2.80				

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: Rate is per 100,000; Rate Ratios are unadjusted; Ethnicity is Level 1 Prioritised

New Zealand Distribution by Ethnicity and Gender

In New Zealand during 2007–2011, hospital admissions for injuries arising from the assault, neglect or maltreatment of children were *significantly* higher for males. Admissions were also *significantly* higher for Māori and Pacific children than for European/Other children (Table 69).

Nature of the Injury Sustained

During 2007–2011, the most common specific injury types sustained as the result of the assault, neglect or maltreatment of children aged 0–4 years were traumatic subdural haemorrhages and superficial head injuries, followed by fractures of the skull and face, and fractures of the femur. For children aged 5–12 years head, upper limb and abdominal/spinal/pelvic injuries predominated (Table 70).

Table 70. Nature of Injuries Arising from Assault, Neglect or Maltreatment in Hospitalised Children 0–12 Years by Age Group, New Zealand 2007–2011

Primary Diagnosis	New Zealand		
	Number: Total 2007–2011	Number: Annual Average	% of Total
Assault, Neglect or Maltreatment			
Children 0–4 Years			
Traumatic Subdural Haemorrhage	101	20.2	25.8
Superficial Head Injury	68	13.6	17.4
Fracture Skull or Facial Bones	16	3.2	4.1
Other Head Injuries	50	10.0	12.8
Injuries to Abdomen, Spine and Pelvis	31	6.2	7.9
Injuries to Thorax (including Rib Fractures)	11	2.2	2.8
Injuries to Upper Limb	27	5.4	6.9
Fracture of Femur	15	3.0	3.8
Other Injuries to Lower Limb	15	3.0	3.8
Maltreatment	36	7.2	9.2
Other Injuries	21	4.2	5.4
Total	391	78.2	100.0
Children 5–12 Years			
Superficial Head Injury	34	6.8	17.3
Fracture Skull or Facial Bones	14	2.8	7.1
Concussion	17	3.4	8.6
Other Head Injuries	30	6.0	15.2
Injuries to Abdomen, Spine and Pelvis	25	5.0	12.7
Injuries to Upper Limb	26	5.2	13.2
Injuries to Lower Limb	12	2.4	6.1
Maltreatment	11	2.2	5.6
Other Injuries	28	5.6	14.2
Total	197	39.4	100.0

Source: National Minimum Dataset



South Island Distribution and Trends

South Island vs. New Zealand

In Canterbury during 2007–2011, hospital admissions for injuries arising from the assault, neglect or maltreatment of children were *significantly* higher than the New Zealand rate, while in the other South Island DHBs rates were not *significantly* different from the New Zealand rate (Table 71).

South Island Mortality

In Nelson Marlborough during 2000–2009, eight children died as the result of injuries arising from assault, neglect or maltreatment, while four died in Otago and one each died in Canterbury and Southland.

Table 71. Hospital Admissions for Injuries Arising from the Assault, Neglect or Maltreatment of Children Aged 0–14 Years, South Island DHBs vs. New Zealand 2007–2011

DHB/Area	Number: Total 2007–2011	Number: Annual Average	Rate per 100,000	Rate Ratio	95% CI
Children 0–14 Years					
Assault, Neglect or Maltreatment Admissions					
Nelson Marlborough	22	4.4	16.86	0.90	0.59–1.37
South Canterbury	5	1.0	9.67	0.51	0.21–1.24
Canterbury	138	27.6	28.61	1.52	1.27–1.82
West Coast	4	0.8	12.71	0.67	0.25–1.80
Otago	24	4.8	15.04	0.80	0.53–1.20
Southland	26	5.2	23.50	1.25	0.84–1.84
New Zealand	843	168.6	18.84	1.00	

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

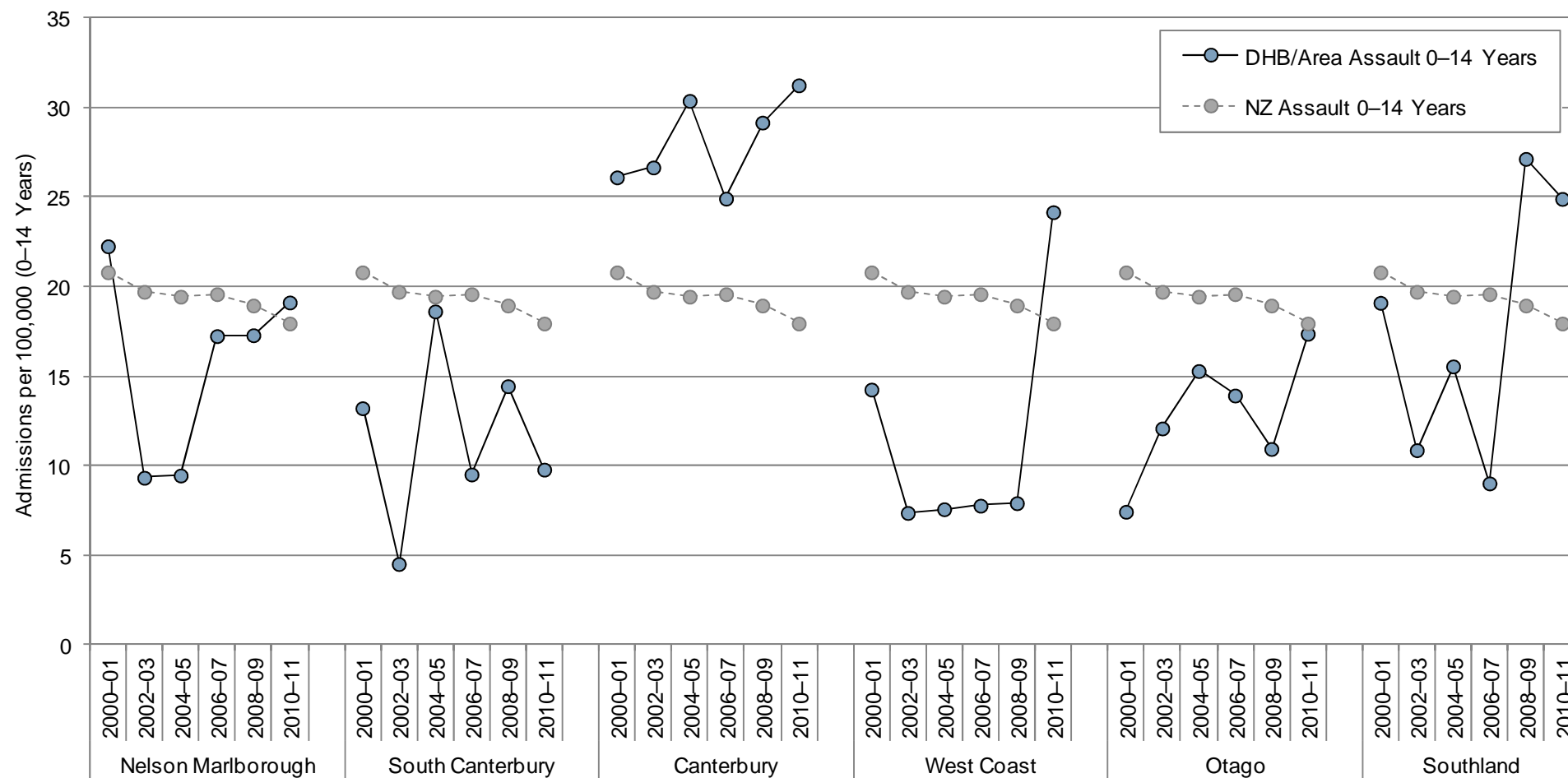
South Island Trends

During 2000–2011, while there were large year to year variations in rates, hospital admissions for injuries arising from the assault, neglect or maltreatment of children were generally lower than the New Zealand rate in Nelson Marlborough, South Canterbury, the West Coast and Otago, but higher than the New Zealand rate in Canterbury (Figure 120).

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

In New Zealand there are a range of publications focussed on child abuse and family violence, and a large number of international reviews have also explored this issue. Table 72 below summarises publications that focus primarily on child maltreatment, while Table 89 on Page 341 considers those publications which focus on family violence more broadly.

Figure 120. Hospital Admissions for Injuries Arising from the Assault, Neglect or Maltreatment of Children Aged 0–14 Years, South Island DHBs vs. New Zealand 2000–2011



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

Table 72. Local Policy Documents and Evidence-Based Reviews Relevant to the Prevention of the Assault, Neglect or Maltreatment of Children

Ministry of Health Policy Documents
<p>Ministry of Health. 2002. Family Violence Intervention Guidelines Child and Partner Abuse. Wellington: Ministry of Health. http://www.health.govt.nz/publication/family-violence-intervention-guidelines-child-and-partner-abuse</p> <p>These guidelines are aimed at all health care professionals and provide a framework for safe and effective interventions to assist victims of violence and abuse. The report identifies health care providers as being in an ideal position to assist in the early identification of family violence because they come into contact with the majority of children. Guidance on identification, assessment and response to suspected child abuse is provided.</p>
<p>Ministry of Health. 2001. Suspected child abuse and neglect: Recommended referral process for General Practitioners. Wellington: Ministry of Health. http://www.health.govt.nz/publication/recommended-referral-process-general-practitioners-suspected-child-abuse-and-neglect</p> <p>This document, developed by the Ministry of Health and Child, Youth and Family with significant input from the Royal New Zealand College of General Practitioners, provides a set of guiding principles and key points for general practitioners in assessing suspected child abuse. A table and flowchart summarising the process for recognition of child abuse and neglect are provided. A set of appendices include body diagram sheets, a referral facsimile, Child, Youth and Family referral procedures, recommended procedures for general practices and relevant legal issues.</p>
Other Government Publications
<p>Bennett P. 2012. The White Paper for Vulnerable Children. Volume I. Wellington: New Zealand Government.</p> <p>Bennett P. 2012. The White Paper for Vulnerable Children. Volume II. Wellington: New Zealand Government.</p> <p>New Zealand Government. 2012. Children's Action Plan: Identifying, Supporting and Protecting Vulnerable Children. Wellington: New Zealand Government. http://www.childrensactionplan.govt.nz/the-white-paper</p> <p>The White Paper on Vulnerable children sets out the government's programme for addressing child maltreatment by identifying the most vulnerable children and targeting services to them. Volume I sets out the actions the Government will take to improve outcomes for the most at-risk children and Volume II contains the evidence and detailed policy rationale for each of the proposals. The White Paper outlines a set of reforms that aim to: help ensure that parents, caregivers, family/whānau, and communities understand and fulfil their responsibilities towards children; give professionals new tools to identify vulnerable children and act earlier; build a new community-based approach to meeting the needs of children at risk of maltreatment as early as possible; reinforce joint responsibility and action across government to improve outcomes for children within target populations, develop a new direction for the way that Child, Youth and Family, justice, health, education and welfare agencies, professionals and other organisations work together, and an information platform through which they can record and share information; develop a new cross-agency Strategy for Children and Young People in Care; build a children's workforce that is responsive to the needs of vulnerable children; and introduce a range of new measures to manage adults at high risk of abusing children. An action plan is also provided.</p>
<p>Minister for ACC. 2003. New Zealand Injury Prevention Strategy. Wellington: Accident Compensation Corporation. http://www.nzips.govt.nz/</p> <p>This strategy establishes a framework for injury prevention activity in New Zealand, across government agencies, local government, non-government organisations, communities and individuals. It aims to provide clear direction for policy development and service delivery in the prevention of intentional and unintentional injuries. The objectives include: to design and develop safe environments, systems and products; advance injury prevention knowledge and information; develop and implement effective injury prevention interventions; ensure appropriate resourcing for injury prevention; and develop, implement and monitor national injury prevention strategies for priority areas, which include assault.</p>
Cochrane Systematic Reviews
<p>Macdonald G, et al. 2012. Cognitive-behavioural interventions for children who have been sexually abused. Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD001930.pub3 http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD001930/frame.html</p> <p>This review assessed the efficacy of cognitive-behavioural approaches (CBT) in addressing the immediate and longer-term sequelae of sexual abuse on children and young people up to 18 years of age. Ten randomised trials (847 participants; 1 waiting list control, 9 treatment as usual control), were included, examining CBT programmes provided to children or children and a parent not implicated in the abuse. All the studies were prone to bias. Depression, post-traumatic stress disorder, anxiety and child behaviour problems, were the primary outcomes. Results suggested that CBT may have a positive impact on the primary outcomes of depression, post-traumatic stress disorder anxiety and child behaviour problems, but most results were not statistically significant. None of the studies reported adverse effects. The authors conclude that the review confirms the potential of CBT to address the adverse consequences of child sexual abuse, but the evidence base is limited and more carefully conducted and better reported trials are needed.</p>

Winokur M, et al. 2009. **Kinship care for the safety, permanency, and well-being of children removed from the home for maltreatment.** Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD006546.pub2
<http://www.mrw.interscience.wiley.com/cochrane/clsystrev/articles/CD006546/frame.html>

This systematic review assessed the effect of kinship care placement (placing children who cannot live at home with other family members or with friends) on the safety, placement stability, and well-being of children removed from the home for maltreatment. The review included 62, mostly US based, quasi-experimental studies, in which children placed in kinship care were compared cross-sectionally or longitudinally with children placed in foster care. Children in kinship foster care appeared to experience better behavioural development, mental health functioning, and placement stability than children in non-kinship foster care. No differences were found in reunification rates, but children in non-kinship foster care were more likely to be adopted and those in kinship care were more likely to be in guardianship. Children in non-kinship foster care were more likely to access mental health services. Study quality was poor overall but the authors concluded that evidence supports treating kinship care as a viable out-of-home placement option.

Dinh-Zarr TB, et al. 2009. **Interventions for preventing injuries in problem drinkers.** Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD001857.pub2
<http://www.mrw.interscience.wiley.com/cochrane/clsystrev/articles/CD001857/frame.html>

This review assessed the effect of interventions for problem drinking on subsequent injury risk. Twenty-three RCTs were identified. Results could not be combined due to the diversity of interventions, populations, and outcomes. The most common intervention was brief counselling by health workers. One trial assessed the effect of a motivational interview administered to injured problem drinkers on instances of arrest for assault, battery, and/or child abuse. Overall, the trials suggested that action with problem drinkers was effective in reducing both injuries and events that lead to injury but the small size of the trials resulted in imprecise, non-significant individual effect sizes and further research is needed.

Zwi K, et al. 2007. **School-based education programmes for the prevention of child sexual abuse.** Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD004380.pub2
<http://www.mrw.interscience.wiley.com/cochrane/clsystrev/articles/CD004380/frame.html>

This review assessed the effectiveness of school-based programmes in improving knowledge about sexual abuse and self-protective behaviours, increasing disclosure of sexual abuse and/or whether such programmes produce any harm. Fifteen trials (5 RCTs and 10 cluster-randomised) measuring knowledge and behaviour change were included in the review. For self-protective behaviour change (assessed by 'simulated stranger test'), two studies had data suitable for meta-analysis; the results of which favoured intervention (OR 6.76, 95% CI 1.44, 31.84). Meta-analysis of nine studies evaluating questionnaire-based knowledge, and four studies evaluating vignette-based knowledge, identified significant increases in knowledge (SMD 0.59, 95% CI 0.44 to 0.74 and SMD 0.37, 95% CI 0.18 to 0.55 respectively). However, the results should be interpreted with caution as knowledge and behaviour change were tested only a short time period after the programme, the studies were conducted in North America and may not apply to other cultures, and several studies reported harms, such as increased anxiety in children. The authors suggest that such programmes should, at best, be seen as part of a community approach to the prevention of child sexual abuse and closely monitored for potential harms.

Barlow J, et al. 2006. **Individual and group-based parenting programmes for the treatment of physical child abuse and neglect.** Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD005463.pub2
<http://www.mrw.interscience.wiley.com/cochrane/clsystrev/articles/CD005463/frame.html>

This review assess the effectiveness of parenting programmes (relatively brief and structured interventions that are aimed at changing parenting practices) in treating physically abusive or neglectful parenting. Seven controlled trials, of variable quality, were included, of which only three assessed the effectiveness of parenting programmes on objective measures of abuse (e.g. the incidence of child abuse, number of injuries, or reported physical abuse). Only one of these found significant differences between the intervention and control groups. Improved outcomes were found for a variety of outcomes used as predictive measures of abusive parenting but few reached statistical significance. Overall there was insufficient evidence to support the use of parenting programmes to treat physical abuse or neglect and further research is needed.

Other Systematic Reviews

Louwens ECFM, et al. 2010. **Screening for child abuse at emergency departments: a systematic review.** Archives of Disease in Childhood, 95(3), 214-18.

This review assessed the effectiveness of interventions applied at emergency departments on increasing the detection rate of confirmed cases of child abuse. Four observational trials were included in the review (n = 8907). After implementation of the screening tool, the rate of detected cases of suspected child abuse increased by 180% (weighted mean in three studies). However, there were no significant increases in the number of confirmed cases of child abuse, reported in two out of four studies. In one study, 11 of the 36 cases (30%) were found to be true accidents after a full assessment, and the other study reported 58 (26%) confirmed cases out of 220 suspected cases. The authors conclude that there is no conclusive evidence to confirm that screening interventions at EDs result in increased detection of cases of confirmed abuse.

<p>National Collaborating Centre for Women's and Children's Health. 2009. When to suspect child maltreatment (Clinical Guideline). London: Royal College of Obstetricians and Gynaecologists. http://guidance.nice.org.uk/CG89/</p> <p>This guidance provides a summary of the clinical features associated with maltreatment that may be observed when a child presents to healthcare professionals. It aims to raise awareness and help healthcare professionals who are not specialists in child protection to identify children who may be being maltreated. The guidance is based on a systematic review. The alerting features of possible child maltreatment are reviewed, including: injuries; anogenital symptoms, signs and infections; clinical presentations; neglect; emotional, behavioural, interpersonal and social functioning; and parent-child interactions. Guidance is provided on what healthcare professionals should do on encountering an alerting feature of possible child maltreatment: listen and observe; seek an explanation; record; and consider, suspect or exclude child maltreatment as a possible explanation. Priorities for research are identified.</p>
<p>Mikton C & Butchart A. 2009. Child maltreatment prevention: a systematic review of reviews. Bulletin of the World Health Organization, 87, 353-61.</p> <p>This review synthesised evidence from systematic and comprehensive reviews on the effectiveness of universal and selective child maltreatment prevention interventions, including an evaluation of the methodological quality. The review included: two review of reviews, six meta-analyses, seven systematic reviews, ten 'comprehensive reviews' and one 'other'. Seven main types of interventions were assessed: home visiting, parent education, child sex abuse prevention, abusive head trauma prevention, multi-component interventions, media-based interventions, and support and mutual aid groups. Home-visiting, parent education, abusive head trauma prevention and multi-component interventions showed promise in the prevention of child maltreatment. Home visiting, parent education and child sexual abuse prevention appeared to be effective in reducing risk factors for child maltreatment. The conclusions were tentative due to the methodological shortcomings of the reviews and outcome evaluation studies they were draw on.</p>
<p>Silverman WK, et al. 2008. Evidence-based psychosocial treatments for children and adolescents exposed to traumatic events. Journal of Clinical Child & Adolescent Psychology, 37(1), 156-83.</p> <p>This review assessed the effectiveness of psychosocial treatments for children and adolescents who have been exposed to traumatic events. Twenty-one RCTs, assessing mostly cognitive behavioural therapies (CBT), were included, targeting sexual abuse (11 studies), physical abuse/neglect (3 studies), community violence (3 studies), marital violence, motor vehicle accidents and a hurricane (one study each). Average effect sizes (ES) for treatment versus controls were 0.43 for post-traumatic stress symptoms (PTSS), 0.24 for depression, 0.09 for anxiety and 0.22 for externalising behaviour problems, which suggested moderate clinical effects for these outcomes. Significant improvements were identified in PTSS for CBT interventions (ES 0.50, 95% CI 0.03 to 0.98; n=1,320) and sexual abuse interventions (ES 0.46, 95% CI 0.14 to 0.79; n=1,052). Results for other outcomes were not significant. While the review provides modest support for the use of CBT in children exposed to childhood trauma, the heterogeneity of the studies limits the conclusions that should be drawn from the pooled results.</p>
<p style="text-align: center;">Other Relevant Publications</p>
<p>Mardani J. 2010. Preventing child neglect in New Zealand: A public health assessment of the evidence, current approach, and best practice guidance. Wellington: Office of the Children's Commissioner. http://www.occ.org.nz/_data/assets/pdf_file/0007/7882/CC_Preventing_child_neglect_122010.pdf</p> <p>This report reviews the nature and consequences of child neglect; and the effectiveness of interventions to prevent the recurrence of neglect. The report describes the prevalence of neglect in New Zealand, using Child Youth and Family (CYF) data from 2009. It summarises government agencies' responses to neglect and compares these responses to best-practice. The report includes findings from a series of stakeholder interviews with professionals from CYF, Police, and the health and education sectors. The report provides a number of recommendations aimed at key government agencies to strengthen the prevention of recurrent neglect in New Zealand.</p>
<p>MacMillan HL, et al. 2009. Interventions to prevent child maltreatment and associated impairment. The Lancet, 373(9659), 250-66.</p> <p>This review considered high-quality research evidence for preventing child maltreatment (physical abuse, sexual abuse, psychological abuse, neglect, and exposure to intimate-partner violence) and interventions to reduce the adverse effects of such exposures. The programme with the best evidence for preventing child physical abuse and neglect was the Nurse-Family Partnership (home-visiting provided by nurses to low-income first-time mothers prenatally and during infancy), which has shown reductions in objective measures of child maltreatment or associated outcomes when administered to high-risk families prenatally and in the first 2 years of a child's life in three RCTs. One trial showed positive effects of the Early Start programme (intensive home-visiting targeted to families facing stress) but further evaluation, at other sites, is required. The common features of these two interventions are identified, including their development as research programmes and their use of workers with tertiary qualifications. However, most home-visiting programmes failed to show benefits. Several interventions have shown promise in single trials: the Triple P-Positive Parenting Program (a comprehensive population-level system of parenting and family support involving professional training to the existing workforce alongside universal media and communication strategies) found positive effects on maltreatment and associated outcomes; hospital-based educational programmes to prevent abusive head trauma (shaken impact syndrome) and enhanced paediatric care for families of children at risk of physical abuse and neglect, but further assessment and replication are needed. School-based educational programmes improve children's knowledge and protective behaviours but whether they prevent sexual abuse is unknown. Parent-child interaction therapy has shown benefits in preventing recurrence of child physical abuse but no interventions have shown positive effects in preventing recidivism of neglect. Cognitive-behavioural therapy has shown benefits for sexually abused children with post-traumatic stress symptoms. There is some evidence for child-focused therapy for neglected children and for mother-child therapy in families with intimate-partner violence.</p>

Centre for Social Research and Evaluation Te Pokapū Rangahau Arotake Hapori. 2008. **Preventing physical and psychological maltreatment of children in families. Review of research for Campaign for Action on Family Violence.** http://www.areyouok.org.nz/research_evaluation_and_statistics.php

This report summarises the findings from a literature review of selected research on the physical and psychological abuse of children and on child maltreatment prevention. The report discusses the harmful effects of abuse, including the effects on the developing brain. Predisposing, precipitating and perpetuating factors are discussed. The report identifies six approaches for primary prevention efforts: establishing a positive view of children, changing attitudes to physical punishment, reducing adult partner violence, addressing adult alcohol and substance abuse, creating accessible and responsive support systems and providing parent education programmes. The characteristics of effective parent education programmes and ways to increase the likelihood that witnesses and bystanders will intervene to stop maltreatment or to report abuse are identified.

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

INJURIES ARISING FROM ASSAULT IN YOUNG PEOPLE

Introduction

In 2007, the Youth'07 survey of 9,107 secondary school students from across New Zealand, assessed self-reported experiences of violence [290]. It found that while violent and anti-social behaviours had reduced since an earlier 2001 survey, experiences of violence were common. Overall, 47.9% of male students and 33.2% of female students reported having been deliberately hit or physically harmed, and 40.9% of male students and 26.8 % of female students reported having hit or physically harmed someone else. Being exposed to violence in the home, at school, or in the community, was strongly associated with instigating violence against others and being a victim of violence, both of which in turn were linked to binge drinking.

Viewed from a different perspective, the rate of Police apprehensions for violent offending increased for all age groups from 14 to 50 years between 1997 and 2007 [291]. The most marked increases were seen among those aged 14 to 16 years, with the rate peaking at 194 per 10,000 population in 2007, compared to 167 per 10,000 population in 1995 [292]. However, it is unclear whether this increase represents a true increase in violence, changes in reporting and policing practices, or a combination of these factors. Further, apprehension data represents the number of apprehensions, rather than the number of offenders, and excludes violence that is not officially reported or recorded [291].

With these issues in mind, the following section explores hospital admissions and mortality from injuries arising from assault in young people aged 15–24 years using information from the National Minimum Dataset and the National Mortality Collection.

Data Source and Methods

Definition

1. Hospitalisations for injuries arising from assault in young people aged 15–24 years
2. Deaths from injuries arising from assault in young people aged 15–24 years

Data Source

1. Hospital Admissions

Numerator: National Minimum Dataset: Hospital admissions in young people aged 15–24 years with a primary diagnosis of injury (ICD-10-AM S00–T79) and an external cause code of intentional injury (ICD-10-AM X85–Y09) in any of the first 10 External Cause codes. As outlined in **Appendix 3**, in order to ensure comparability over time, all cases with an Emergency Department Specialty Code (M05–M08) on discharge were excluded.

Denominator: NZ Statistics NZ Estimated Resident Population (projected from 2007)

2. Mortality

Numerator: National Mortality Collection: Deaths in young people aged 15–24 years with a clinical code (cause of death) of Intentional Injury (ICD-10-AM X85–Y09).

Denominator: NZ Statistics NZ Estimated Resident Population (projected from 2007)

Interpretation

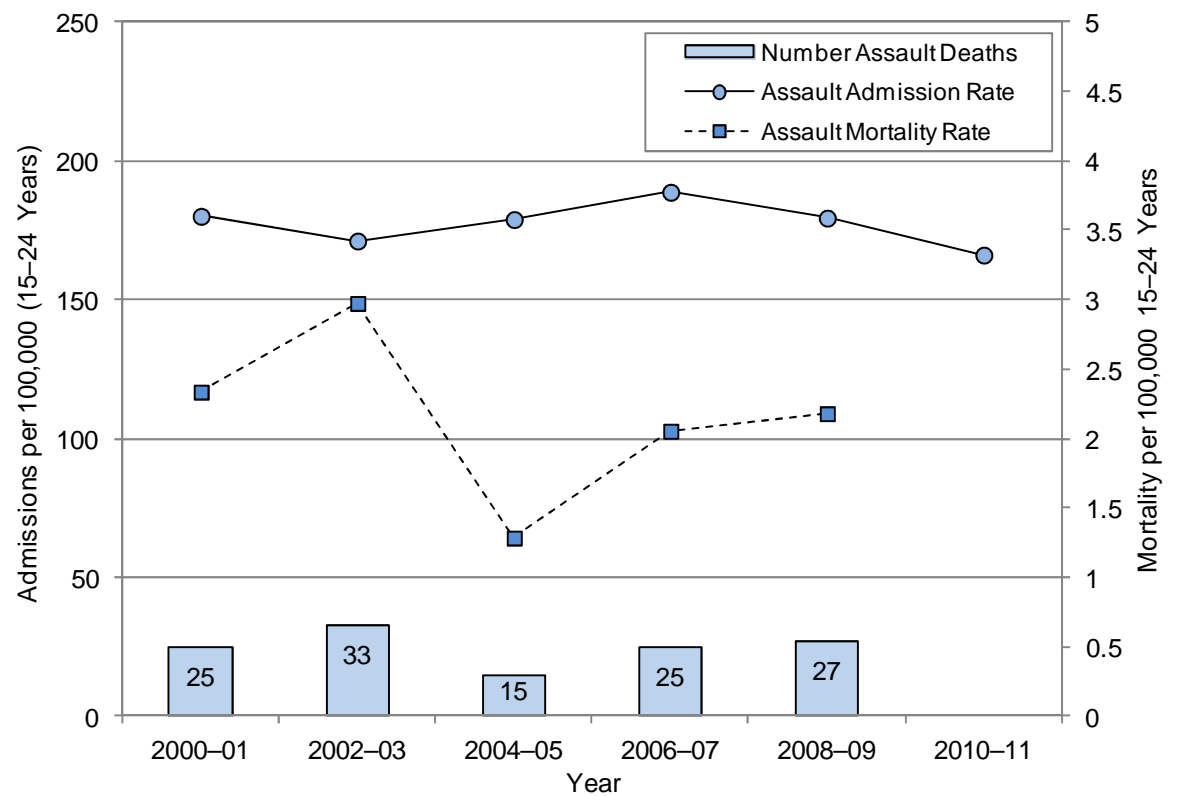
The limitations of the National Minimum Dataset are discussed at length in **Appendix 3**. The reader is urged to review this Appendix before interpreting any trends based on hospital admission data.

New Zealand Distribution and Trends

New Zealand Trends

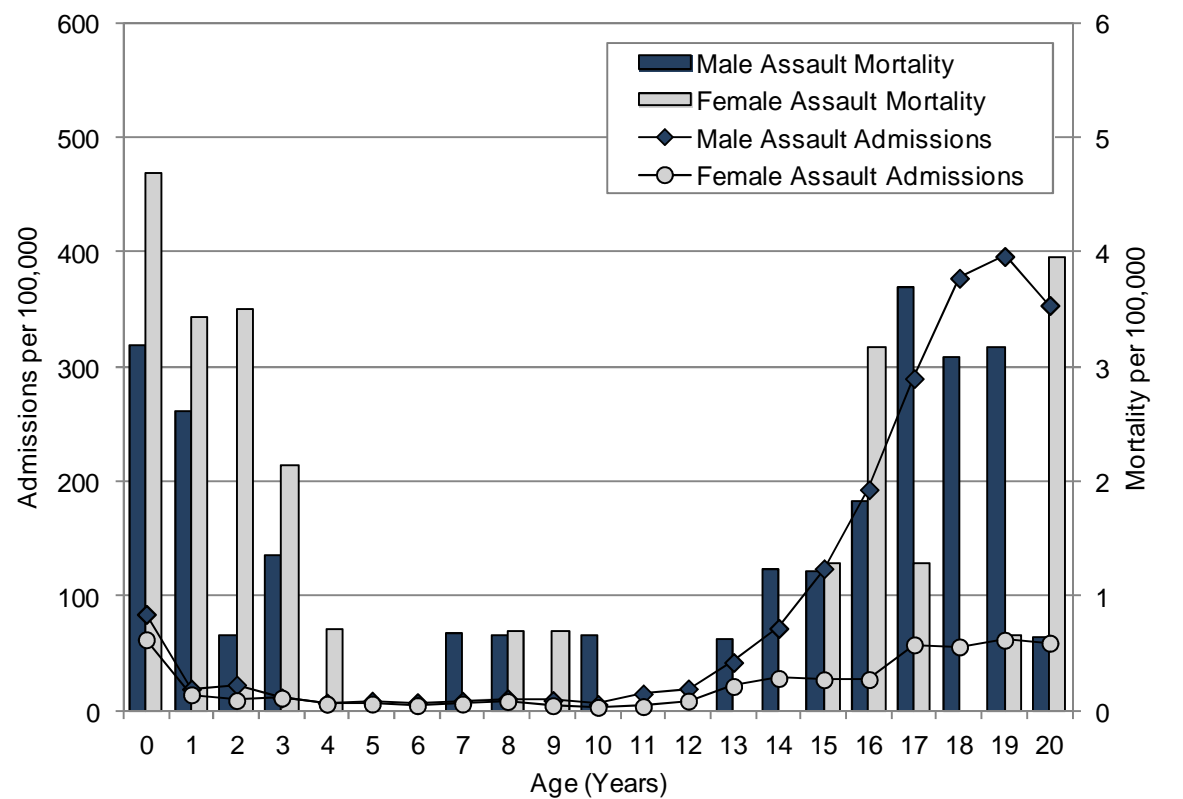
In New Zealand during 2000–2011, hospital admissions for injuries arising from assault in young people remained relatively static, while mortality during 2000–2009 fluctuated from year to year. On average during 2000–2009, 12.5 young people per year died from injuries arising from an assault (**Figure 121**).

Figure 121. Hospital Admissions (2000–2011) and Deaths (2000–2009) due to Injuries Arising from Assault in New Zealand Young People Aged 15–24 Years



Source: Numerator: Admissions: National Minimum Dataset; Mortality: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: Number of deaths are per two year period

Figure 122. Hospital Admissions (2007–2011) and Deaths (2005–2009) due to Injuries Arising from Assault in New Zealand Children and Young People by Age and Gender



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



New Zealand Distribution by Age and Gender

In New Zealand during 2007–2011, hospital admissions for injuries arising from assault in males increased rapidly during the mid to late teens, reaching a peak at 19 years of age. While assault admissions for females also increased during the teenage years, rates were lower than for males at all ages. Assault mortality during 2005–2009 was also highest for males during their mid to late teens, although patterns for females were more variable (**Figure 122**).

New Zealand Distribution by Ethnicity and Gender

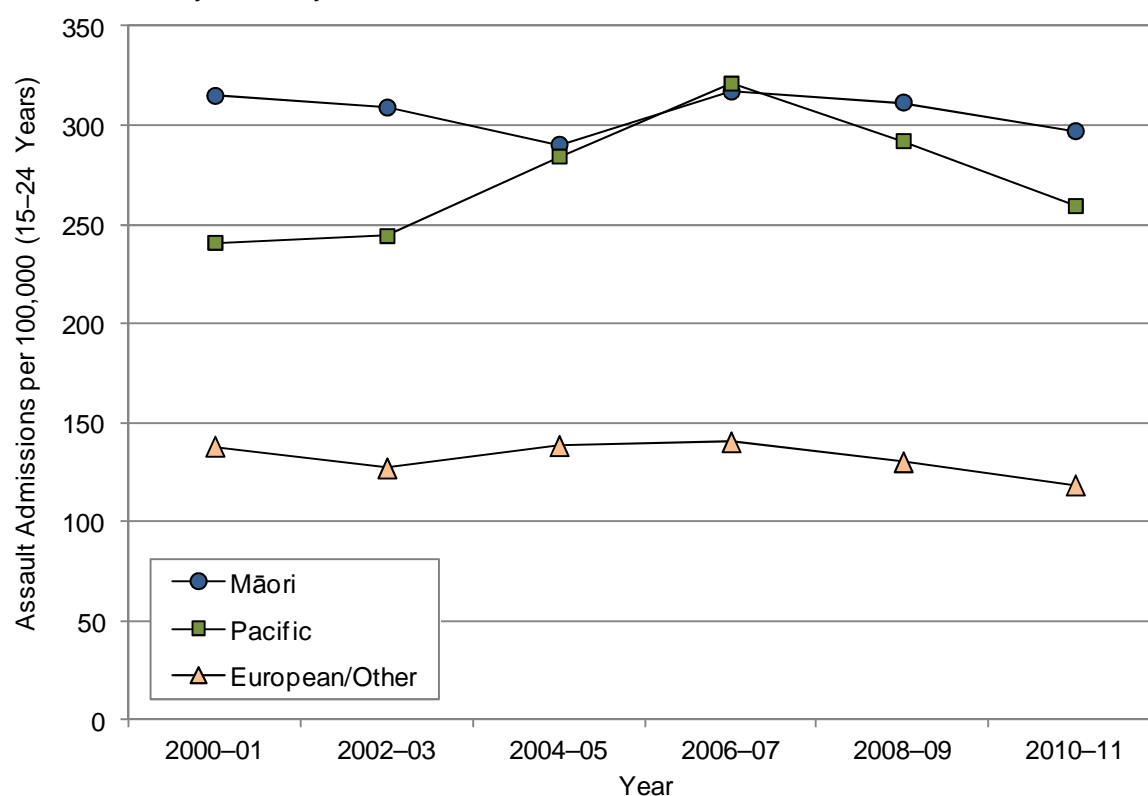
In New Zealand during 2007–2011, hospital admissions for injuries arising from assault were *significantly* higher for young men than for young women. Admissions were also *significantly* higher for Māori and Pacific young people than for European/Other young people (**Table 73**). Similar ethnic differences were seen throughout 2000–2011 (**Figure 123**).

Table 73. Hospital Admissions for Injuries Arising from Assault in Young People Aged 15–24 Years by Ethnicity and Gender, New Zealand 2007–2011

Assault Admissions							
Young People 15–24 Years							
Variable	Rate	RR	95% CI	Variable	Rate	RR	95% CI
European/Other	126.94	1.00		Female	51.49	1.00	
Māori	306.53	2.41	2.28–2.56	Male	295.09	5.73	5.31–6.18
Pacific	284.87	2.24	2.07–2.43				

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: Rate is per 100,000; Rate Ratios are unadjusted; Ethnicity is Level 1 Prioritised

Figure 123. Hospital Admissions for Injuries Arising from Assault in Young People Aged 15–24 Years by Ethnicity, New Zealand 2000–2011



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population (projected from 2007); Note: Ethnicity is Level 1 Prioritised

Nature of the Injury Sustained

In New Zealand during 2007–2011, the most common types of injuries sustained as the result of an assault in young people were head injuries, with fractures of the lower jaw, nose and facial bones being particularly prominent. Upper limb (including hand and wrist) injuries were also common (**Table 74**).

Table 74. Nature of Injury Arising from Assault in Hospitalised Young People Aged 15–24 Years, New Zealand 2007–2011

Primary Diagnosis	New Zealand		
	Number: Total 2007–2011	Number: Annual Average	% of Total
Assault Admissions, Young People 15–24 Years			
Head Injuries			
Fracture of the Lower Jaw	1,289	257.8	23.6
Fracture of the Nasal Bones	316	63.2	5.8
Fracture of Malar and Maxillary Bones	302	60.4	5.5
Concussion	270	54.0	4.9
Fracture of the Orbital Floor	244	48.8	4.5
Superficial Head Injury	145	29.0	2.7
Other Fractures Skull or Facial Bones	160	32.0	2.9
Other Head Injuries	895	179.0	16.4
Other Injuries			
Injuries to Wrist and Hand	681	136.2	12.5
Other Injuries to Upper Limb	326	65.2	6.0
Injuries to Abdomen, Spine and Pelvis	308	61.6	5.6
Injuries to Lower Limb	175	35.0	3.2
Injuries to Thorax (including Rib Fractures)	169	33.8	3.1
Other Injuries	188	37.6	3.4
Total Injuries	5,468	1,093.6	100.0

Source: National Minimum Dataset

South Island Distribution and Trends

South Island vs. New Zealand

In Nelson Marlborough, South Canterbury and the West Coast during 2007–2011, hospital admissions for injuries arising from assault in young people were *significantly* higher than the New Zealand rate, while in Canterbury and Otago, rates were *significantly* lower. Rates in Southland were not *significantly* different from the New Zealand rate (**Table 75**).

South Island Mortality

In Canterbury during 2000–2009, ten young people died as the result of an assault, while five died in Otago, four in Nelson Marlborough, three in South Canterbury and one each in Southland and the West Coast.



Table 75. Hospital Admissions for Injuries Arising from Assault in Young People Aged 15–24 Years, South Island DHBs vs. New Zealand 2007–2011

DHB/Area	Number: Total 2007–2011	Number: Annual Average	Rate per 100,000	Rate Ratio	95% CI
Young People Aged 15–24 Years					
Assault Admissions					
Nelson Marlborough	171	34.2	215.3	1.23	1.05–1.43
South Canterbury	96	19.2	301.1	1.71	1.40–2.10
Canterbury	486	97.2	135.0	0.77	0.70–0.84
West Coast	48	9.6	254.0	1.45	1.09–1.92
Otago	154	30.8	92.4	0.53	0.45–0.62
Southland	136	27.2	194.6	1.11	0.93–1.31
New Zealand	5,468	1,093.6	175.6	1.00	

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

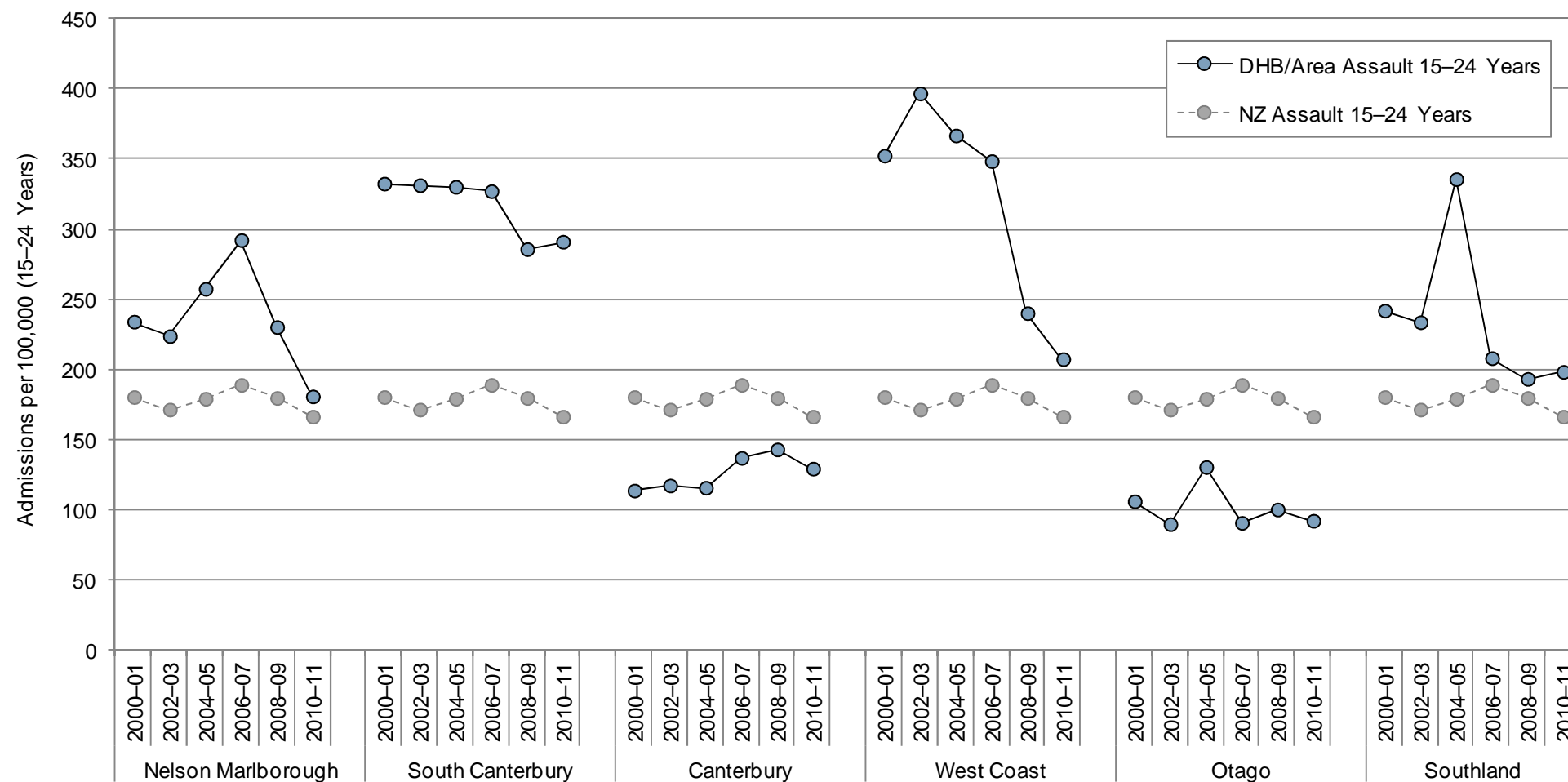
South Island Trends

During 2000–2011, while there were large year to year variations in rates, hospital admissions for injuries arising from assault in young people were consistently higher than the New Zealand rate in Nelson Marlborough, South Canterbury, the West Coast and Southland, but consistently lower than the New Zealand rate in Canterbury and Otago (**Figure 124**).

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

In New Zealand, there is no single strategy focussed on the prevention of assault in young people. Evidence from a variety of sources will therefore need to be incorporated into the development of local strategies. **Table 76** (below) provides an overview of a range of evidence-based reviews which may be useful in this context. In addition, **Table 72** on **Page 316** summarises publications addressing the prevention of assault in the context of child abuse, while **Table 89** on **Page 341** considers those publications which focus on family violence more broadly.

Figure 124. Hospital Admissions for Injuries Arising from Assault in Young People Aged 15–24 Years, South Island DHBs vs. New Zealand 2000–2011



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

Table 76. Local Policy Documents and Evidence-Based Reviews Relevant to the Prevention of Assault in Young People

Government Publications
<p>Crawford R & Kennedy P. 2008. Improving interventions to reduce violent offending by young people in New Zealand. Wellington: Ministry of Justice. http://www.justice.govt.nz/publications/global-publications/improving-interventions-to-reduce-violent-offending-by-young-people-in-new-zealand</p> <p>This paper addressed concerns about the perceived increase in the level of youth violence and interventions to reduce violent offending by young people aged 14 to 16 years. Police apprehensions for violent offending among 14 to 16 year olds increased sharply between 2005 and 2006 but it was unclear whether this represented a true increase in violence or changes in reporting and policing. New Zealand interventions are reviewed against research evidence and a number of recommendations are made.</p>
<p>Ministries of Education, Health, Justice and Social Development. 2007. Inter-agency Plan for Conduct Disorder/Severe Antisocial Behaviour 2007-2012. Wellington: Ministry of Social Development. http://www.msd.govt.nz/about-msd-and-our-work/work-programmes/policy-development/anti-social-behaviour/index.html</p> <p>This inter-agency plan was developed to establish a more comprehensive and effective cross-government approach to conduct disorder/severe antisocial behaviour in children (behaviours which are defined as severe, persistent across contexts and over time, and which involve repeated violations of societal and age-appropriate norms). The report identifies key challenges facing services, including inconsistent mechanisms for identifying and determining eligibility for services, gaps in the availability of specialist services, and lack of alignment with the evidence base in some programmes. It sets out the four key proposals for 2007 to 2012: establishing leadership, co-ordination, monitoring and evaluation; transitioning existing service provision to evidence-based, best-practice interventions; establishing an intensive, comprehensive behavioural service for three to seven year-olds; and building a shared infrastructure for the delivery of specialist behavioural services.</p>
Cochrane Systematic Reviews
<p>Mytton JA, et al. 2006. School-based secondary prevention programmes for preventing violence. Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD004606.pub2 http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD004606/frame.html</p> <p>This review assessed the effectiveness of school based violence prevention programmes for children identified as aggressive or at risk of being aggressive. The review identified 56 RCTs, 34 of which had data suitable for inclusion in the meta-analysis. None of the studies reported data on violent injuries. Aggressive behaviour was significantly reduced in intervention groups compared to no intervention groups immediately post intervention (SMD -0.41, 95% CI -.56 to -0.26). The seven studies reporting 12 month follow-up maintained the reduction in aggressive behaviour (SMD -0.40, 95% CI -0.73 to -0.06). School or agency disciplinary actions in response to aggressive behaviour were non-significantly reduced in intervention groups for nine trials with data (SMD -0.48, 95% CI -1.16 to 0.19) and were not maintained, based on two studies reporting follow-up to two to four months. Interventions designed to improve relationship or social skills appeared to be more effective than interventions designed to teach skills of non-response to provocative situations. Improvements in behaviour were achieved in primary and secondary schools, and for groups of mixed sex versus boys alone, but the longer term benefit and the effects on injury remain uncertain.</p>
Other Systematic Reviews
<p>Snider C & Lee J. 2009. Youth violence secondary prevention initiatives in emergency departments: a systematic review. Canadian Journal of Emergency Medicine, 11(2), 161-8.</p> <p>This review assessed the effectiveness of hospital-based secondary prevention programmes for violently injured youth identified in emergency departments. Seven articles, evaluating four interventions (two RCTs and two retrospective studies), were included. Beneficial effects were identified in one RCT (significant reduction in reinjury rates: treatment group 8.1% versus control group 20.3%, $p = 0.05$) and two retrospective studies. A second smaller RCT found no significant effects. Despite some promising results it is difficult to draw conclusions from these studies due to their small size and large loss to follow up. The authors recommend further research to capitalise on the opportunity to intervene in a setting where young people are considered to be in a reflective and receptive state of mind.</p>
<p>Park-Higgerson HK, et al. 2008. The evaluation of school-based violence prevention programs: a meta-analysis. Journal of School Health, 78(9), 465-79.</p> <p>This review assessed the effectiveness and characteristics of school-based violence prevention programmes. Five programme characteristics (the application of theory, the type of programme such as universal or selective, the number of programmes such as single- or multiple approach interventions, the characteristics of the target population, and the type of instructor) which could explain programme success were identified and used to generate hypotheses tested in the meta-analysis. Twenty-six RCTs were included in the meta-analysis. Overall, the intervention groups did not have significant effects in reducing aggression and violence compared to the control groups (ES -0.09, 95% CI -0.23 to 0.05). There was no significant difference between interventions but programmes that used non-theory-based interventions, focused on at-risk and older children, and employed intervention specialists had slightly stronger effects in reducing aggression and violence. Interventions using a single approach had a mild positive effect compared to multi-component interventions (effect size -0.15, 95% CI -0.29 to -0.02), contrary to expectation. Small sample sizes and heterogeneity of the studies may have contributed to the lack of significant effects.</p>

<p>Limbos MA, et al. 2007. Effectiveness of interventions to prevent youth violence a systematic review. American Journal of Preventive Medicine, 33(1), 65-74.</p> <p>This review assessed the effectiveness of primary (implemented universally to prevent the onset of violence), secondary (implemented selectively with youth at increased risk for violence), and tertiary (focused on youth who had already engaged in violent behaviour) youth violence interventions. Forty-one studies (15 RCTs and 26 other) were included in the review. The heterogeneity of the studies did not allow the authors to pool results and the studies were assessed by 'vote-counting' to identify significant (one or more violence outcome indicators significantly different at the $p < 0.05$ level) and non-significant results. Half (49%) of interventions were identified as effective. Tertiary-level interventions were more likely to report effectiveness than primary or secondary-level interventions. Several interventions assessed by RCT are discussed in more detail but the authors call for increased standardisation of evaluations to allow assessment of differences between interventions and within subpopulations.</p>
<p>Hahn RA, et al. 2007. Effectiveness of Universal School-Based Programs to Prevent Violent and Aggressive Behaviour: A Systematic Review. American Journal of Preventive Medicine, 33(2), S114-S29.</p> <p>This review examined the effectiveness of universal school-based interventions (delivered to all children in a school-based setting) in preventing aggressive and violent behaviour in pre-school and school aged children. The primary outcomes were violence by youths and victimisation of youths. Fifty-three studies (39 prospective and controlled, 5 retrospective or multiple pre-test post-test, 9 single pre-test post-test), with median follow-up of six months, were included in the review. The median overall effect showed a 15% reduction (interquartile range for effect sizes between the 25th and 75th quartiles -44.2 to -2.3) in violence-related outcomes at all school grades examined in intervention groups compared to controls. There was no significant relationship between intervention duration and effect size but the effectiveness of the interventions reduced slightly over time once the intervention had ended. This review forms the basis for the US government Guide to Community Preventive Services "Violence prevention focused on children and youth: school-based programs" available at http://www.thecommunityguide.org/violence/school.html.</p>
<p>Hahn RA, et al. 2005. The effectiveness of therapeutic foster care for the prevention of violence: A systematic review. American Journal of Preventive Medicine, 28(2), 72-90.</p> <p>This review assessed the effectiveness of therapeutic foster care (TFC) for violence prevention among children with severe emotional disturbance and among adolescents with chronic delinquency. In TFC programmes children who cannot live at home are placed with foster parents trained to provide a structured environment for learning social and emotional skills, and monitored at home, school, and leisure activities by programme personnel. Only five studies were included in the review, three prospective trials with a comparison group and two before and after studies with no comparison group. The two studies of TFC for children with severe emotional disturbance yielded inconsistent results. The three studies of TFC for adolescents with chronic delinquency by one research team indicated a reduction in subsequent violent crime (median effect size -71.9%). This review formed the basis for the US government Guide to Community Preventive Services "Therapeutic foster care to reduce violence" available at http://www.thecommunityguide.org/violence/therapeuticfostercare/index.html, which recommends TFC for the reduction of violence among adolescents with chronic delinquency.</p>
<p style="text-align: center;">Other Relevant Evidence</p>
<p>Alliston L. 2012. Alcohol-related injury: An evidence-based literature review. Wellington: Research New Zealand. http://www.alac.org.nz/sites/default/files/research-publications/pdfs/alcohol-related%20injury%20lit%20review%20FEB2012_0.pdf.</p> <p>This report assesses evidence for the relationship between alcohol and injury and includes a review of interventions to address alcohol-related injury. Multi-component programmes are identified as the approach showing the clearest evidence of effectiveness to date in reducing harm in drinking environments, including violence and traffic crashes, but the report concludes that the development of interventions to reduce the impact of alcohol consumption on the incidence of injury is in its infancy.</p>
<p>Flood M & Fergus L. 2008. An Assault on Our Future: The impact of violence on young people and their relationships. Sydney: White Ribbon Foundation. http://www.whiteribbon.org.au/resources/research</p> <p>This Australian report on the impact of violence on young people and their relationships includes an assessment of dating and relationship violence among young people and the causes of violence against girls and young women, and a review of prevention among children and young people. A number of recommendations are made.</p>
<p>Mercy JA, et al. 2002. Chapter 2. Youth violence. In Krug E et al. (Eds.), World Report on Violence and Health. Geneva: World Health Organization. http://www.who.int/violence_injury_prevention/violence/youth/en/index.html</p> <p>The goal of the World Report on Violence and Health was to raise awareness about the problem of violence globally, and to make the case that violence is preventable and that public health has a crucial role to play in addressing its causes and consequences. The chapter on youth violence includes a review of the epidemiology of youth violence globally, a description of key risk factors, a review of the effectiveness of interventions and policy responses that have been tried and recommendations for action at local, national and international levels.</p>

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

CHILD YOUTH AND FAMILY NOTIFICATIONS

Introduction

In New Zealand, Child, Youth and Family (CYF), a service of the Ministry of Social Development, has responsibility, under the Children, Young Persons and their Families Act, 1989, for protecting children and young people who are at risk of being or who have been abused or neglected [293]. When CYF receive a report of concern, for example from the education or health sectors, families/whānau or the general public, its staff are legally bound to follow it up [294]. CYF works closely with the New Zealand Police, whose primary duties are to protect victims and consider questions of criminal liability for perpetrators.

In New Zealand, the total number of reports of concern received by CYF increased from 71,927 in 2006/2007 to 152,800 in 2011/2012, with these increases being thought to reflect an increased public awareness of the need for the care and protection of children and a growing willingness by communities to contact CYF where there are concerns for a child's welfare [26,295]. The proportion of reports of concern requiring further action declined during this period however, from 61% in 2006/2007 to 38% in 2010/2011 [26]. Emotional abuse (which includes witnessing family violence) was the most common finding from investigations completed during June 2011–2012 (12,114 investigations), followed by neglect (4,766 investigations), physical abuse (3,249 investigations) and sexual abuse (1,396 investigations) [295]. Between 2006 and 2010 there were 36 deaths due to assault among children aged 28 days to 14 years [289].

In interpreting these trends, it is also important to recognise that at each point in the referral pathway, from the notifier, to the telephone operator, to the intake social worker, a decision has to be made about whether to escalate the concern further, with these decisions often being made in the context of insufficient or conflicting information, time pressures and an increasing intolerance within the community of child abuse. The consequences of errors in child protection decisions however (which may be unavoidable given the conditions of inherent uncertainty), can be damaging to children and their whānau/families [296]. In the worst case scenario missing a concern could result in an avoidable child death, while a false alarm, an investigation where no harm or abuse is substantiated, can result in humiliation, anger and fear for parents and misdirected resources.

The following section reviews the number of care and protection notifications received by Child Youth and Family offices in the South Island DHBs during 2004–2011, as well as the distribution of care and protection notifications for New Zealand as a whole.

Data Source and Methods

Definition

1. Number of care and protection notifications received by Child, Youth and Family
2. Proportion of care and protection notifications where further assessment was required
3. Outcome of assessments for children and young people notified to Child, Youth and Family

Data Source

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

Denominator: Not applicable (see notes below)

Notes on Interpretation

Note 1: The number of notifications and the number requiring further assessment do not represent the number of distinct clients, as some clients have multiple notifications and assessments during any given year. Similarly, the number of assessment findings does not represent the number of client assessments, as some clients have multiple assessment records during a given year. In addition, as some clients have more than one type of finding during an assessment, they may appear across several categories depending on the type of finding.

Finally the number of assessment findings in a year does not directly relate to the number of notifications or assessments in a year, as there is a time lag between the need for an assessment being identified and the assessment being completed. As a consequence, the figures presented in this section may overestimate the number of children referred to CYF, or the total number found to have experienced abuse in any given year. For similar reasons, no rate data have been provided in this section.

Note 2: The numbers in this section may differ from those presented in previous NZCYES Reports as Child, Youth and Family no longer include the intakes received under court order (S19 of the Children, Young Persons, and Their Families Act 1989 and s132 of the Care of Children Act 2004) in routine reporting, as they are not considered to be care and protection notifications.

Note 3: Since July 2010, Police family violence referrals that require no assessment by Child, Youth and Family have been received separately in the CYF database. However in this section, they have been included in the main analysis in order to preserve continuity with previous years.

Note 4: CYF notification data does not include any information on the ethnicity of individual children and young people, although this information is available for those requiring further assessment. Thus in this section, ethnicity data is presented only for those for whom further assessment was required.

New Zealand Distribution and Trends

Number of Notifications and Proportion Requiring Further Assessment

In New Zealand during 2011, a total of 150,747 care and protection notifications were received by CYF offices, with 38.4% being thought to require further assessment. While these figures reflect a progressive increase in notifications since 2004, when 40,939 were received, the proportion requiring further assessment declined (86.3% required further assessment in 2004). The absolute number of notifications requiring further assessment however continued to increase, from 35,350 in 2004 to 57,949 in 2011, an increase of 63.9% over this period (**Table 77, Figure 125**).

Notifications Requiring Further Assessment by Ethnicity

In New Zealand during 2004–2011, the number of care and protection notifications received by CYF that required further assessment increased for children and young people of all ethnic groups (**Table 78**). During the 2011 financial year, 45.6% of notifications requiring further assessment were for Māori children and young people, while 32.0% were for European, 11.4% were for Pacific, and 1.9% were for Asian children and young people (**Figure 126**).

Source of CYF Care and Protection Notifications

In New Zealand during 2004, family members and the police were the most frequent sources of CYF care and protection notifications, followed by the education and health sectors. While the number of notifications received from all referral sources rose during 2004–2011, the largest increases were seen for Police family violence referrals. Thus by 2011, Police family violence referrals were the most frequent source of CYF notifications, followed by the Police (other referral types) and the health sector. However, the proportion of Police family violence referrals which required further assessment declined, from 70.5% in 2004 to 15.4% in 2011. While similar trends were seen for other referral sources, the magnitude of these declines was much less marked (**Table 79**).

Assessment Findings for Cases Requiring Further Investigation

Of those notifications which were assessed further during 2004–2012, a large proportion resulted in no abuse being found. Where abuse was found however, physical and emotional abuse, and neglect were prominent. Behavioural and relationship difficulties were the most frequent non-abuse findings (**Table 80**). Because of the nature of the reporting system however, and the fact that a single child may appear in a number of categories, it is difficult to determine what proportion of cases related predominantly to a particular type of abuse (e.g. physical, emotional, sexual).

In interpreting these figures, it must also be remembered that a single child may have been the subject of multiple notifications and that there were also significant changes to the notification system during this period.

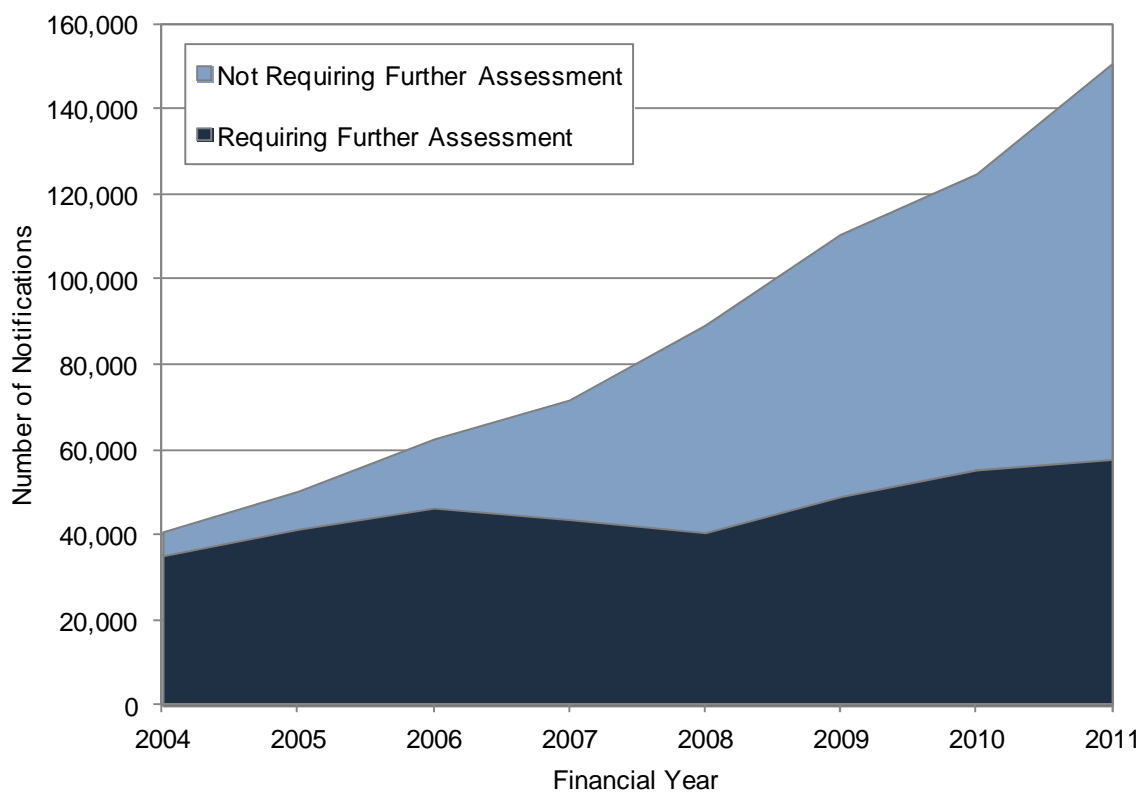


Table 77. Number of Notifications Received by Child Youth and Family Offices, New Zealand 2004–2011 Financial Years

	Total Number of Notifications	Number Requiring Further Assessment	% Notifications Requiring Further Assessment
New Zealand			
2004	40,939	35,350	86.3
2005	50,488	41,599	82.4
2006	62,739	46,541	74.2
2007	71,927	43,845	61.0
2008	89,461	40,739	45.5
2009	110,797	49,224	44.4
2010	124,921	55,494	44.4
2011	150,747	57,949	38.4

Source: Child Youth and Family

Figure 125. Number of Notifications Received by Child Youth and Family Offices by Outcome, New Zealand 2004–2011 Financial Years



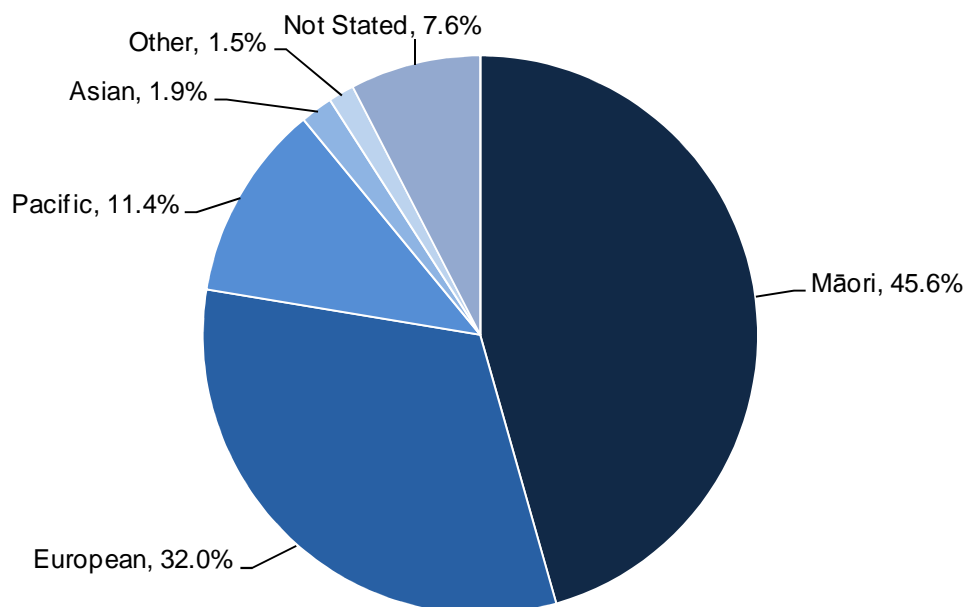
Source: Child Youth and Family

Table 78. Number of Notifications to Child, Youth and Family Requiring Further Assessment by Ethnicity, New Zealand 2004–2011 Financial Years

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

Source: Child Youth and Family

Figure 126. Proportion of Notifications to Child, Youth and Family Requiring Further Assessment by Ethnicity, New Zealand 2011 Financial Year (n=57,949)



Source: Child Youth and Family



Table 79. Number of Notifications to Child, Youth and Family and Proportion Requiring Further Assessment by Referrer, New Zealand 2004–2011 Financial Years

New Zealand									
Number of Notifications									
Year	Police Family Violence	Family	Police	Health	Education	Court	Others	Unknown	Total
2004	3,389	7,192	7,311	4,739	4,888	685	12,721	14	40,939
2005	9,238	7,576	7,645	5,417	5,586	744	14,271	11	50,488
2006	19,535	7,252	8,189	5,980	5,733	772	15,265	13	62,739
2007	26,609	7,286	8,720	6,711	5,775	897	15,904	25	71,927
2008	35,445	8,360	12,737	7,851	6,845	909	17,294	20	89,461
2009	51,135	9,019	14,430	8,636	7,345	678	19,542	12	110,797
2010	57,472	9,814	17,779	9,955	7,832	838	21,214	17	124,921
2011	82,240	10,383	14,903	10,995	8,115	807	23,177	127	150,747
Number Requiring Further Assessment									
2004	2,389	6,086	6,125	4,230	4,550	629	11,329	12	35,350
2005	6,367	6,313	6,105	4,752	5,055	679	12,319	9	41,599
2006	10,605	5,953	6,196	5,205	5,121	714	12,736	11	46,541
2007	10,872	5,093	5,668	5,113	4,608	790	11,685	16	43,845
2008	8,994	4,663	5,747	4,928	4,947	777	10,672	11	40,739
2009	12,280	5,358	6,601	5,838	5,525	583	13,031	8	49,224
2010	12,781	5,947	9,162	6,656	5,867	744	14,326	11	55,494
2011	12,686	6,006	10,226	6,937	6,061	692	15,274	67	57,949
% Requiring Further Assessment									
2004	70.5	84.6	83.8	89.3	93.1	91.8	89.1	85.7	86.3
2005	68.9	83.3	79.9	87.7	90.5	91.3	86.3	81.8	82.4
2006	54.3	82.1	75.7	87.0	89.3	92.5	83.4	84.6	74.2
2007	40.9	69.9	65.0	76.2	79.8	88.1	73.5	64.0	61.0
2008	25.4	55.8	45.1	62.8	72.3	85.5	61.7	55.0	45.5
2009	24.0	59.4	45.7	67.6	75.2	86.0	66.7	66.7	44.4
2010	22.2	60.6	51.5	66.9	74.9	88.8	67.5	64.7	44.4
2011	15.4	57.8	68.6	63.1	74.7	85.7	65.9	52.8	38.4

Source: Child Youth and Family

Table 80. Outcome of Assessment for Children and Young People Notified to Child Youth and Family, New Zealand 2004–2012 Financial Years

Year	Abuse				Non-Abuse		Abuse Not Found
	Emotional Abuse	Physical Abuse	Sexual Abuse	Neglect	Behavioural/ Relationship Difficulties	Self-Harm/ Suicidal	
New Zealand							
2004	2,571	1,864	1,149	2,878	3,325	100	15,860
2005	4,592	2,351	1,424	4,074	4,355	173	23,388
2006	6,142	2,336	1,291	4,199	4,657	172	26,011
2007	8,256	2,274	1,194	4,486	4,461	138	22,921
2008	8,664	2,321	1,003	4,302	4,154	116	19,334
2009	10,938	2,855	1,126	4,677	4,256	106	25,486
2010	12,535	2,886	1,201	4,403	5,007	137	29,313
2011	12,595	3,225	1,505	4,762	4,908	147	30,286
2012	12,114	3,249	1,396	4,766	4,840	153	31,583

Source: Child Youth and Family

South Island Distribution and Trends

Number of Notifications and Proportion Requiring Further Assessment

During the 2011 financial year, CYF offices in the South Island received 22,363 care and protection notifications, with 52.9% being thought to require further assessment. While the number of notifications had increased from 8,578 in 2004, the proportion requiring further assessment declined (88.3% required further assessment in 2004). Nevertheless, the number of notifications requiring further assessment increased, from 7,577 in 2004 to 11,820 in 2011, an increase of 56.0% over this period (**Table 81**).



Table 81. Number of Notifications Received by Child Youth and Family Offices in the South Island 2004–2011

Year	Notifications	Requiring Further Assessment		Notifications	Requiring Further Assessment	
	Number	Number	%	Number	Number	%
	South Island					
	Nelson Marlborough			South Canterbury		
2004	1,327	1,189	89.6	532	421	79.1
2005	1,455	1,238	85.1	623	531	85.2
2006	1,654	1,349	81.6	584	520	89.0
2007	1,838	1,411	76.8	680	542	79.7
2008	2,184	1,038	47.5	767	443	57.8
2009	2,952	1,019	34.5	807	410	50.8
2010	2,976	1,672	56.2	1,141	749	65.6
2011	4,295	2,172	50.6	1,255	812	64.7
	Canterbury			West Coast		
	Number	Number	%	Number	Number	%
2004	3,783	3,391	89.6	445	381	85.6
2005	4,423	3,833	86.7	462	416	90.0
2006	5,278	4,274	81.0	485	443	91.3
2007	6,506	3,770	57.9	402	347	86.3
2008	8,359	3,269	39.1	544	368	67.6
2009	9,524	3,770	39.6	613	384	62.6
2010	9,449	5,122	54.2	599	397	66.3
2011	10,615	5,327	50.2	721	368	51.0
	Otago			Southland		
	Number	Number	%	Number	Number	%
2004	1,348	1,186	88.0	1,143	1,009	88.3
2005	1,618	1,375	85.0	1,181	958	81.1
2006	1,540	1,263	82.0	1,372	984	71.7
2007	1,707	1,392	81.5	1,501	1,149	76.5
2008	2,036	1,563	76.8	2,283	1,116	48.9
2009	2,824	1,613	57.1	2,782	1,521	54.7
2010	2,547	1,527	60.0	2,245	1,420	63.3
2011	3,203	1,775	55.4	2,274	1,366	60.1

Source: Child Youth and Family; Note: *Includes Youth Justice

Assessment Findings for Cases Requiring Further Investigation

Of the notifications received by CYF Offices in the South Island DHBs during 2004–2011 which were investigated further, a large proportion resulted in no abuse being found. Where abuse was found, physical and emotional abuse, and neglect were prominent. Behavioural and relationship difficulties were the most common non-abuse finding (**Table 82**). Because of the nature of the reporting system however, and the fact that a single child may appear in a number of categories, it is difficult to determine what proportion of cases related predominantly to a particular type of abuse.

Table 82. Outcome of Assessment for Children Notified to Child Youth and Family Offices in Nelson Marlborough, South Canterbury and the West Coast DHBs, 2004–2012 Financial Years

Year	Abuse				Non-Abuse		Abuse Not Found
	Emotional Abuse	Physical Abuse	Sexual Abuse	Neglect	Behavioural/ Relationship Difficulties	Self-Harm/ Suicidal	
Nelson Marlborough							
2004	80	39	27	105	99	<5	574
2005	95	34	34	104	168	<5	691
2006	185	50	45	127	192	<5	669
2007	314	43	35	183	161	<5	610
2008	148	44	20	123	184	<5	482
2009	151	44	25	110	160	9	592
2010	230	48	29	130	144	<5	1,018
2011	419	69	58	169	242	5	1,085
2012	328	71	47	134	233	6	1,239
South Canterbury							
2004	21	9	10	35	49	<5	237
2005	25	19	17	44	68	<5	269
2006	58	25	18	39	62	<5	379
2007	35	34	16	37	80	<5	317
2008	52	19	6	56	67	5	182
2009	85	26	7	62	84	<5	185
2010	121	31	8	62	121	0	412
2011	149	44	35	48	121	<5	361
2012	83	37	37	39	131	<5	433
West Coast							
2004	15	12	8	25	58	<5	134
2005	15	8	7	30	53	0	181
2006	39	8	11	25	123	0	279
2007	31	8	7	15	104	<5	194
2008	15	<5	0	30	100	<5	150
2009	45	5	5	57	95	<5	205
2010	50	12	5	27	120	<5	211
2011	57	15	<5	24	58	0	203
2012	65	13	13	33	80	0	239

Source: Child Youth and Family



Table 83. Outcome of Assessment for Children Notified to Child Youth and Family Offices in Canterbury, Otago and Southland, 2004–2012 Financial Years

Year	Abuse				Non-Abuse		Abuse Not Found
	Emotional Abuse	Physical Abuse	Sexual Abuse	Neglect	Behavioural/ Relationship Difficulties	Self-Harm/ Suicidal	
Canterbury							
2004	143	135	106	238	460	5	1,656
2005	265	155	107	321	543	13	2,082
2006	317	155	76	339	647	11	2,605
2007	436	122	65	386	613	12	1,961
2008	453	165	39	476	540	11	1,517
2009	410	148	36	356	551	5	2,245
2010	642	182	70	318	714	<5	3,198
2011	667	222	125	342	668	9	3,143
2012	714	205	106	354	532	17	3,333
Otago							
2004	47	45	31	143	177	<5	534
2005	45	41	34	157	259	<5	763
2006	78	54	36	164	218	<5	704
2007	74	60	50	181	264	5	734
2008	166	86	51	215	254	<5	700
2009	224	97	44	245	298	<5	820
2010	128	76	44	191	276	<5	841
2011	142	73	37	229	238	<5	976
2012	161	89	39	267	193	<5	1,023
Southland							
2004	89	50	33	66	59	<5	343
2005	115	71	52	109	100	8	732
2006	111	21	42	79	102	8	548
2007	136	43	31	72	129	<5	523
2008	160	40	30	83	122	<5	591
2009	233	61	28	121	120	<5	807
2010	268	71	38	130	152	<5	824
2011	179	62	57	91	153	0	771
2012	155	76	38	78	149	<5	828

Source: Child Youth and Family

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

In New Zealand there are a range of publications which consider child abuse and family violence, and a large number of international reviews have also explored this issue in detail. **Table 72** on **Page 316** considers those publications which focus primarily on child abuse and neglect, while **Table 89** on **Page 341** considers those publications which focus on family violence more broadly.

FAMILY VIOLENCE

Introduction

Te Rito, the New Zealand Family Violence Prevention Strategy defines family violence as:

“a broad range of controlling behaviours commonly of a physical, sexual and/or psychological nature, which typically involve fear, intimidation and emotional deprivation. It occurs within close interpersonal relationships.”[194]

Family violence encompasses violence between any members of a family group or whānau. Children exposed to inter-partner violence (violence between adult partners) are at increased risk of behavioural and emotional problems, including childhood trauma symptoms, and also experience higher rates of other types of child maltreatment [297,298,299]. There has also been concern that exposure to inter-parental violence may encourage the development of later violence in children [300]. For example, a meta-analysis published in 2000 found a weak to moderate association between exposure to inter-parental violence during childhood and subsequent inter-partner violence [301]. However, after controlling for confounding factors such as socioeconomic background, associations between childhood exposure to inter-parental violence and subsequent increased risks of inter-partner violence perpetration and victimization and violent crime, were reduced to statistical non-significance in a New Zealand prospective cohort [300].

In terms of the prevalence of family violence in New Zealand, 24% of the 980 children in the Dunedin Multidisciplinary Health and Development Study reported seeing or hearing violence or threats of violence between parents or parental figures [302]. Regardless of who carried out the violence, 64% of young people witnessing family violence described themselves as being upset “a lot” or “extremely” and a further 23% reported being “a bit” upset. A more recent survey of 2,077 New Zealand children aged 9 to 13 years found that 27% reported having witnessed violence against an adult [303]. Similarly, the Youth’07 survey of 9,107 secondary school students found that 48.2% of students reported witnessing adults yelling or swearing at each other in the previous 12 months, and 10.4% reported witnessing adults hitting or physically hurting each other (an increase from 5.6% in the 2001 survey) [290]. Students that had experienced or witnessed violence in their home reported depressive symptoms than those who had not (males 12.6% compared to 5.7%; and females 25.9% compared to 11.3%).

Both males and females may be victims and perpetrators of family violence, although male perpetrators are more likely to seriously injure or kill the women and children they are violent towards [300,304]. Family violence can affect families from all socioeconomic backgrounds, but higher rates of inter-partner violence have been identified among young, cohabiting adults of low socioeconomic status, particularly when they have children [305]. Internationally, inter-partner violence has also been linked to poverty and heavy alcohol consumption [306]. An analysis of data from the New Zealand National Survey of Crime Victims 2001 found that the strongest predictors of being a victim of inter-partner violence over a lifetime were being Māori, aged 25 to 39 years, female, a solo parent, living in an over-crowded household, on social welfare benefits, and being divorced or separated [307]. A secure attachment to a non-violent parent or other significant carer has been cited consistently as an important protective factor for children exposed to family violence [308].

The following section reviews the number of Police family violence investigations occurring during 2009–2011. In interpreting these figures, it must be remembered that research suggests that Police are only involved in around 10% of the family violence incidents occurring in New Zealand each year [309]. Thus these figures need to be viewed as the “tip of the iceberg” in terms of prevalence. Further, trends may also be sensitive to public awareness campaigns and changes in the way the Police recognise and record family violence incidents. Despite this, it is hoped that these figures will provide some insights into the context surrounding family violence in New Zealand.



Data Source and Methods

Definition

1. Number of Police family violence investigations

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

Data Source

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

Notes on Interpretation

Note 1: Police policy defines family violence as *"violence which is physical, emotional, psychological and sexual and includes intimidation or threats of violence"*. The term "family" includes parents, children, extended family members, whānau, or any other person involved in a relationship (e.g. partners, caregivers, boarders and flatmates), but does not include neighbours.

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

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

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

New Zealand Distribution

Family Violence Investigations Where Children Were Present

Of the 86,704 Police family violence investigations which occurred in New Zealand during 2011, children were reported as being present or usually residing with the victim in 54.0% of cases (**Table 84**).

Table 84. Number and Proportion of Police Family Violence Investigations where Children were Present or Usually Residing with the Victim, New Zealand 2009–2011

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

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

Relationship Between the Offender and the Victim

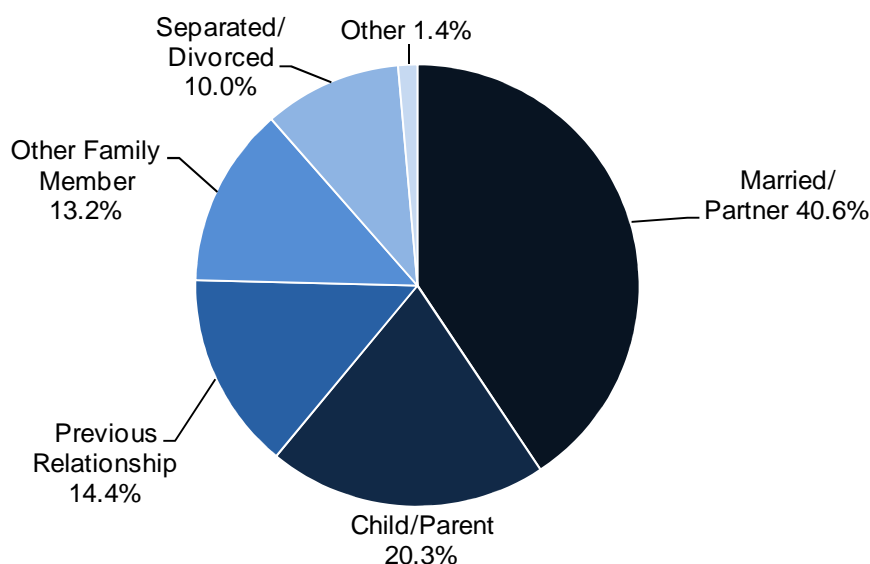
In New Zealand during 2011, there were 35,536 Police family violence investigations where an offence occurred, and where the relationship between the offender and the victim or complainant was recorded. In 40.6% of cases the victim/complainant was the spouse or partner of the offender, with a further 24.4% having been either previously married or in a relationship. In 20.3% of cases there was a parent/child relationship between the offender and the victim or complainant (**Table 85, Figure 127**).

Table 85. Relationship Between the Offender and the Victim in Police Family Violence Investigations where an Offence Occurred, New Zealand 2009–2011

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

Source: NZ Police

Figure 127. Relationship Between the Offender and the Victim in Police Family Violence Investigations where an Offence Occurred, New Zealand 2011



Source: NZ Police

Table 86. Police Family Violence Investigations Where Injuries were Reported by Injury Type, New Zealand 2009–2011

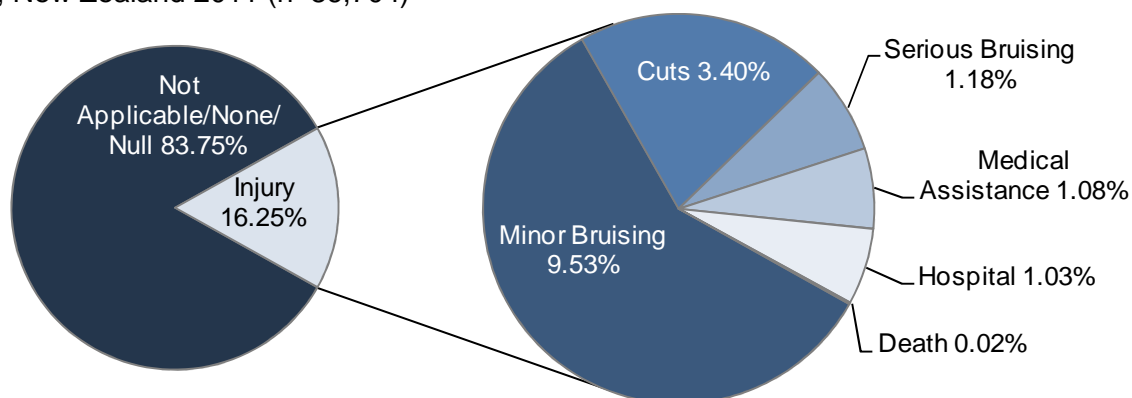
Injury Reported	2009		2010		2011	
	Number	%	Number	%	Number	%
None	15,473	19.87%	17,037	20.13%	17,684	20.40%
Minor Bruising	8,556	10.99%	8,758	10.35%	8,264	9.53%
Cuts	2,749	3.53%	3,003	3.55%	2,949	3.40%
Serious Bruising	1,062	1.36%	1,132	1.34%	1,026	1.18%
Medical Assistance	854	1.10%	931	1.10%	939	1.08%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

Source: NZ Police

Family Violence Investigations Where Injuries Were Reported

In New Zealand during 2011, injuries were reported in 16.3% of Police family violence investigations. The most common injuries reported were minor bruising (9.5%), cuts (3.4%) and serious bruising (1.2%). In 893 cases (1.0%) a hospital attendance was required, and in 20 cases (0.02%) the incident resulted in a death (**Table 86, Figure 128**).

Figure 128. Police Family Violence Investigations where Injuries were Reported by Injury Type, New Zealand 2011 (n=86,704)



Source: NZ Police

Family Violence Investigations Where an Offence Occurred

Police family violence investigations during 2011 resulted in 39,935 offences being disclosed. While not all family violence investigations identified an offence and some investigations identified more than one offence, the nature of the offences disclosed gives some indication as to the types of incidents occurring. In this context, a very high proportion of the offences related to assaults, with property damage, breach of violence orders, and threatening behaviour also making a significant contribution (**Table 87**).

Table 87. Police Family Violence Investigations where an Offence Occurred by Offence Group, New Zealand 2009–2011

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

Source: NZ Police

South Island Distribution

Family Violence Investigations in the South Island

During 2011, a large number of family violence investigations occurred in the ten South Island Police Areas (**Table 88**). While these figures cannot be used to comment on trends in the prevalence of family violence during this period, they suggest that a large number of family violence incidents are occurring in the South Island each year, and that (based on NZ level figures) children are likely to be present at a large proportion of these.

Table 88. Family Violence Investigations for Police Areas in the South Island 2009–2011

Tasman Police District			
Police Area	2009	2010	2011
Nelson Bays	1,309	1,475	1,502
Marlborough	598	680	727
West Coast	412	419	491
Canterbury Police District			
Police Area	2009	2010	2011
Northern Canterbury	2,792	3,128	3,057
Christchurch Central	1,589	1,753	1,607
Southern Canterbury	1,658	1,871	1,940
Mid South Canterbury	917	1,063	1,096
Southern Police District			
Police Area	2009	2010	2011
Dunedin	1,594	1,646	1,745
Otago Rural	508	508	519
Southland	1,597	1,631	1,783

Source: NZ Police; Note: See **Appendix 8** for Police Area Boundaries

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

In New Zealand there are a range of publications which address the prevention of child abuse and family violence. A large number of international reviews have also explored this issue. **Table 89** below summarises publications and evidence-based reviews which address family violence, while **Table 72** on **Page 316** summarises publications which focus primarily on child abuse and neglect.

Table 89. Local Policy Documents and Evidence-Based Reviews Relevant to Family Violence

Ministry of Health Policy Documents
<p>Ministry of Health. 2002. Family Violence Intervention Guidelines Child and Partner Abuse. Wellington: Ministry of Health. http://www.health.govt.nz/publication/family-violence-intervention-guidelines-child-and-partner-abuse</p> <p>These guidelines are aimed at all health care professionals and provide a framework for safe and effective interventions to assist victims of violence and abuse. The report identifies health care providers as being in an ideal position to assist in the early identification of family violence because they come into contact with the majority of the population. Guidance on identification, assessment and response to suspected child abuse is provided. It is recommended that: all females aged 16 years and older should be screened routinely for physical and sexual abuse by a partner, using validated screening tools which are provided; all females aged 12 to 15 years who present with signs and symptoms indicative of abuse should be questioned, preferably in the context of a general psychosocial assessment; and males aged 16 years and older who present with signs and symptoms indicative of abuse by a partner should be questioned.</p>



Other Government Publications

Carswell S, et al. 2010. **Evaluation of the Family Violence Interagency Response System (FVIARS). Summary of Findings.** Wellington: Ministry of Social Development. <http://www.msd.govt.nz/about-msd-and-our-work/publications-resources/evaluation/family-violence-interagency-response-system/index.html>

The Family Violence Interagency Response System (FVIARS) is an interagency initiative (Child, Youth and Family, New Zealand Police and the National Collective of Independent Women's Refuges plus other government and community agencies) designed to more effectively manage cases of family violence reported to the Police with a key objective to enable collaborative, co-ordinated interagency responses to family violence. FVIARS was found to have improved relationships between agencies and allowed for local adaptability, efficient use of resources and a more accurate picture of individual cases and the possible risks of further violence. The evaluation identified the need for developing a results-based database to test outcomes, an interagency national-level monitoring and evaluation framework, success indicators across agencies, and a common risk assessment framework.

Martin J & Levine M. 2010. **Safe@home Evaluation.** Wellington: Ministry of Social Development. <https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/evaluation/safe-at-home/evaluation-of-the-safe-at-home-project.html>

Safe@home is a service provided by shine* (Safer Homes in New Zealand Everyday), an Auckland NGO that works with women and child victims of family violence identified as being at high risk from further domestic violence, to make homes safer from attack. The aim is to enable women and children to stay in their own homes, as an alternative to a refuge stay or relocation, by providing whatever security work or devices are deemed necessary. Thirty of the 50 women in the evaluation completed client information sheets before and after the security upgrade and were asked "On a scale of 1 to 7 where would you rate your current fear of risk of harm from the offender?" The average fear of harm score before the safety upgrade was 6.23 and 2.70 following the safety upgrade. The evaluation found that the project was well supported by all involved and there was good progress towards the goal of reducing participants' fear of continued violence. It recommends longer term follow up to assess whether this reduction in fear is maintained and whether it leads to longer term housing stability.

Cochrane Systematic Reviews

Ramsay J, et al. 2009. **Advocacy interventions to reduce or eliminate violence and promote the physical and psychosocial well-being of women who experience intimate partner abuse.** Cochrane Database of Systematic Reviews doi:10.1002/14651858.CD005043.pub2
<http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD005043/frame.html>

This systematic review assessed the effects of advocacy interventions, conducted outside and within health care settings, on women experiencing intimate partner abuse. Advocacy interventions aim to help abused women by providing them with information and support to facilitate access to community resources. Ten trials, involving 1,527 participants (aged 15 to 61 years), were included, differing in duration (from 30 minutes to 80 hours), outcomes measures, and length of follow up. Intensive advocacy (12 hours or more duration) may help terminate physical abuse in women leaving domestic violence refuges at 12 to 24 months follow-up (OR 0.43, 95% CI 0.23 to 0.80), but not at up to 12 months follow-up. There were no significant changes in quality of life, psychological distress or depression measures. Meta-analyses of brief advocacy interventions (less than 12 hours duration) found an increased use of safety behaviours was consistent with the receipt of brief advocacy both at up to 12 months (WMD 0.60, 95% CI 0.14 to 1.06) and at 12 to 24 months (WMD 0.48, 95% CI 0.04 to 0.92) follow up. The evidence supports intensive advocacy decreasing physical abuse more than one to two years after the intervention for women already in refuges, and brief advocacy increasing the use of safety behaviours by abused women, but it is unknown whether less intensive interventions in healthcare settings are effective for women who still live with abusive partners.

Other Systematic Reviews

Nelson HD, et al. 2012. **Screening women for intimate partner violence: a systematic review to update the U.S. Preventive Services Task Force recommendation.** Annals of Internal Medicine, 156(11), 796-808.

This review assessed the effectiveness of screening (one large cluster RCT) and interventions for women in health care settings (6 RCTs) in reducing intimate partner violence (IPV) and related health outcomes, the diagnostic accuracy of screening instruments (15 studies evaluating 13 screening instruments), and adverse effects of screening and interventions (reported in 3 trials, 11 descriptive studies and 2 systematic reviews). Data were synthesised narratively. Six of the screening instruments were found to be a highly accurate. One large cluster RCT assessing the effectiveness of screening versus usual care indicated reduced IPV and improved health outcomes for both groups, but no statistically significant differences between the groups. Four trials of counselling reported reduced IPV and improved birth outcomes for pregnant women, reduced IPV for new mothers, and reduced pregnancy coercion and unsafe relationships for women attending family-planning clinics. Minimal adverse effects were identified with screening, but some women experienced discomfort, loss of privacy, emotional distress, and concerns about further abuse. The authors conclude that screening instruments designed for health care settings can accurately identify women experiencing IPV, although further evaluation of computerised screening, which may be more acceptable to women, is required. Effectiveness trials were limited by heterogeneity, lack of true control groups and use of self-reported measures but indicated that screening could reduce IPV and improve health outcomes, depending on the population screened and outcomes measured.

O'Campo P, et al. 2011. **Implementing successful intimate partner violence screening programs in health care settings: Evidence generated from a realist-informed systematic review.** Social Science & Medicine, 72(6), 855-66.

This realist-informed systematic review (involving the assessment of contextual characteristics of programmes to help explain programme success or failure) aimed to determine why and how universal intimate partner violence (IPV) screening programmes in health care settings are effective. Twenty-three studies of varying methodologies, assessing 17 programmes, were included. Programmes that took a comprehensive approach (incorporated multiple programme components, including institutional support, training and immediate access to support services) were successful in increasing IPV screening and disclosure/identification rates. The authors did not assess whether screening is effective in reducing IPV, arguing that it is not the best outcome to examine given the complexity of the screening process and numerous mediating factors between screening and a change or reduction in violence. A conceptual framework for IPV screening in health care settings is provided.

Murphy CM & Ting L. 2010. **The effects of treatment for substance use problems on intimate partner violence: A review of empirical data.** Aggression and Violent Behaviour, 15(5), 325-33.

This review assessed whether, and to what extent, treatment for substance use problems is associated with a reduction in intimate partner violence (IPV). Seven uncontrolled studies (approximately 600 participants), that assessed abusive behaviour before and after the intervention, and two small RCTs were included in the review. Overall, the prevalence of IPV was higher before substance use treatment than after treatment, and the risk for IPV after treatment was higher for relapsed versus remitted cases. Small to moderate effect sizes were observed for reductions in the frequency of IPV after substance use treatment, and large effects observed for reductions in psychological aggression. Reduced alcohol consumption and improved relationship functioning appeared to account for the observed reductions in partner abuse. Although generally supportive of substance use treatments, the findings are limited by the observational nature of most of the studies.

Feder G, et al. 2009. **How far does screening women for domestic (partner) violence in different health-care settings meet criteria for a screening programme? Systematic reviews of nine UK National Screening Committee criteria.** Health Technology Assessment, 13(16), 1-113.

This extensive review assessed whether the evidence base fulfilled selected UK National Screening Committee (NSC) criteria to support the implementation of screening for partner violence in health-care settings. Evidence was reviewed for seven criteria: the lifetime prevalence was sufficient for partner violence to be a significant public health problem; a valid screening tool for use in healthcare settings was identified ([the Hits, Insults, Threatens and Screams scale](#)); most women patients considered screening acceptable (range 35 to 99%), although potential harms were identified; evidence for effectiveness of advocacy is growing, and psychological interventions may be effective, although not necessarily for women identified through screening; no trials of screening programmes measured morbidity and mortality; acceptability screening among health-care professionals ranged from 15% to 95%; there were no cost-effectiveness studies. The reviewers found insufficient evidence to implement a screening programme for partner violence against women either in health services generally, or in specific clinical settings and recommendations for further research were made.

Rabin RF, et al. 2009. **Intimate Partner Violence Screening Tools: A Systematic Review.** American Journal of Preventive Medicine, 36(5), 439-45.e4.

This review assessed the data on screening tools for intimate partner violence tested in healthcare settings. Thirty-three articles, evaluating 21 intimate partner violence screening tools, were included. Sensitivities and specificities varied widely within and between the screening tools and no single IPV screening tool had well-established psychometric properties. The authors recommend that individual providers must determine the optimal balance between brevity and comprehensiveness and identify a need for further testing and validation in diverse populations using a universally accepted comparison measure.

Stover CS, et al. 2009. **Interventions for Intimate Partner Violence: Review and Implications for Evidence-Based Practice.** Professional Psychology - Research & Practice, 40(3), 223-33.

This review assessed intimate partner violence (IPV) treatment studies that used randomised case assignment, and had at least 20 participants per group. Studies were classified according to primary treatment focus: perpetrator (7 RCTs, 6,390 participants), victim (5 RCTs, approximately 1,306 participants), couples (5 studies, approximately 887 couples), or child-witness (3 RCTs, involving 75 pre-schoolers, 181 children aged 6 to 12 years, and 237 sexually abused children) interventions. There was limited evidence of the effectiveness of interventions on reducing repeat violence. Most interventions showed minimal benefit above arrest alone, and consistent recidivism rates of approximately 30% within six months. Couples treatment approaches that simultaneously addressed problems with substance abuse and aggression yielded the lowest recidivism rates (18% for Behavioural Couple Therapy versus 43% for individual substance misuse treatment at 12-month follow-up), supporting the benefit of integrating substance abuse treatments into interventions. The child witness to IPV intervention studies assessed reductions in symptoms of children exposed to violence. Several treatments showed promising effectiveness data, treatments involving the caregiver and child were the most effective. However, the generalisability of these findings is limited because continued residence with the perpetrator and maternal substance abuse were exclusion criteria.

Robinson L & Spilsbury K. 2008. **Systematic review of the perceptions and experiences of accessing health services by adult victims of domestic violence.** Health and Social Care in the Community, 16(1), 16-30.

This review qualitatively synthesised evidence on the perceptions and experiences of adult victims of domestic violence when accessing healthcare services. Ten qualitative studies were included. The data were thematically analysed to identify recurrent themes and to answer four questions: what factors enabled and/or discouraged participants to disclose abuse to health professionals; what responses from healthcare professionals did participants define as particularly helpful and/or unhelpful in accessing services; what barriers deterred participants from accessing services in a healthcare environment and what would help them gain access to health care; and in situations where abuse was disclosed, did participants feel that appropriate support and referral was provided. The studies identified that victims of domestic violence experienced difficulties when accessing healthcare services. Common themes included inappropriate responses by healthcare professionals; discomfort in the healthcare environment; perceived barriers to disclosing domestic violence, with many participants indicating they would like domestic violence to be proactively and routinely raised by healthcare professional; and a lack of confidence in the outcomes of disclosure to a health professional. The authors make a number of recommendations regarding staff training and service provision.

Whitaker DJ, et al. 2006. **A critical review of interventions for the primary prevention of perpetration of partner violence.** Aggression and Violent Behaviour, 11(2), 151-66.

This review assessed primary prevention programmes targeting partner violence. Eleven studies, comprising of five cluster RCTs, one randomised trial with no control group, three quasi-experimental and one pre-post test non-experimental study, were included. Interventions were mostly brief, universal, school-based programmes targeted middle or high-school aged students. Study quality was limited by short follow-up (only two studies collected data beyond six months), high attrition rates (retention ranged from 37.8% to 84%) and a lack of behavioural measures. Two of the four studies that measured behaviour found a positive intervention impact. The two effective trials had the most comprehensive interventions, using both individual-level curricula and other community-based interventions, and the most rigorous designs. The authors conclude that while primary prevention programmes show promise, further research is needed to assess their overall efficacy.

Wathen C & MacMillan HL. 2003. **Interventions for violence against women: Scientific review.** JAMA: The Journal of the American Medical Association, 289(5), 589-600.

This review assessed the effectiveness of interventions to detect and prevent violence against women from a primary care perspective, including screening to detect abuse or risk of abuse, and intervention programmes for women or their partners which can be accessed from primary care. Sixteen studies (approximate overall n=5084), made up of one systematic review, six RCTs, three quasi-randomised RCTs, one controlled clinical trial, four cohort studies and one non-equivalent control group study, were identified. No studies examining the effectiveness of screening where the end point was improved outcomes for women, as opposed to identification of abuse status, were identified. No high-quality studies assessing the effectiveness of a shelter stay in decreasing the incidence of violence were identified. One RCT identified that for women who had spent at least one night in a shelter, those who received a specific programme of advocacy counselling reported a decreased rate of re-abuse and improved quality of life during the 2-year follow-up in comparison with those receiving normal care (76% versus 89%). Only one high-quality intervention programme RCT was identified which did not show significant benefits. Most of the studies did not assess potential harms.

Other Relevant Publications

Koziol-McLain J, et al. 2009. **Hospital Responsiveness to Family Violence: 48 month follow-up evaluation report.** Auckland: Auckland University of Technology. <http://www.health.govt.nz/our-work/preventative-health-wellness/family-violence/reports-family-violence>

The Ministry of Health's Violence Intervention Programme (VIP) in DHBs seeks to reduce and prevent the health effects of violence and abuse through early identification, assessment and referral of victims presenting to health services. This report documents the development of DHB family violence systems responses based on four rounds of hospital audits from 2004 to 2008. The evaluation found that Partner Abuse Intervention Programme scores and Child Abuse and Neglect Intervention Programme scores had increased substantially over time, suggesting programme maturation and institutional change. The authors found that improvement was strongly linked to support and resources provided by the Ministry of Health and DHBs.

Flood M & Fergus L. 2008. **An Assault on Our Future: The impact of violence on young people and their relationships.** Sydney: White Ribbon Foundation. <http://www.whiteribbon.org.au/resources/research>

This Australian report on the impact of violence on young people and their relationships includes an assessment of the effects of living with adult violence on children and young people and the causes of violence against girls and young women, and a review of prevention among children and young people. A number of recommendations are made.

Graham-Bermann SA & Hughes HM. 2003. **Intervention for Children Exposed to Interparental Violence (IPV): Assessment of Needs and Research Priorities.** Clinical Child and Family Psychology Review, 6(3), 189-204.

This paper reviewed interventions aimed at reducing the negative outcomes in children exposed to interparental violence. The paper provides an overview of the development of interventions from the 1980s and reviews three more recent randomised intervention studies, with a treatment as usual or waiting list controls, in more detail. All three studies, which assessed well planned, intensive interventions that included parenting support for mothers, reported positive outcomes for mothers and children. Further research is required to confirm these findings and assess interventions in different populations.

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