

# UNINTENTIONAL INJURIES





# Introduction

Injury is a leading cause of death in New Zealand among children and young people and unintentional injury is the largest contributor.<sup>94</sup> There are two common causes of unintentional injury deaths in this age group. The rate of suffocation is relatively high among infants under 12 months of age and the rate for road traffic injury is high among those aged 15–24 years. Drowning rates are the next most common cause of death for all age groups. The Statistics NZ data for 2000 to 2013 indicate that the rate of traffic crash deaths has fallen over the last decade, and the rate for injury, as Crash Analysis System (CAS) records of injury, has been falling since 2007.<sup>95</sup> Further analysis shows that while the fatality rates for 0–14 year olds have remained relatively low, high rates continue to be seen among those aged 15–24 years. Since 2009 there has been a decrease in the rate of sudden unexpected death in infancy (SUDI) to which the rate of suffocation contributes.<sup>18</sup>

There are effective interventions for both these causes of injury death and data are showing a reduction in the rates for both. Other causes of injury death also have effective interventions and what is needed is consistent and ongoing implementation. Evidence of this is seen in New Zealand with proper implementation of regulations and strategies for road safety being effective in reducing the road toll:<sup>96</sup> for example, speed limits, the Graduated Drivers Licence, child restraint use, alcohol limits, median strips, and the changes that have been made in the construction of cars.

Injury death is recognised internationally as a leading cause of death for those aged under 25 years, but it is not the only serious outcome as a result of injury.<sup>97,98</sup> Increasingly attention is being paid to the well-recognised long term impact of the physical, cognitive and behavioural problems that can arise with serious injury, for example, traumatic head injury.<sup>99</sup> Traumatic head injury, is often associated with road traffic crashes and it has implications for the individual and their whānau as well as for health and other services. Injury such as burns and near drowning can also result in high personal and resource costs.

Internationally concern is expressed regarding the lack of sustained, strategically-planned action to reduce injury at the country level, and the lack of focus on unintentional injury globally, particularly when injury has been implicated as the leading cause of inequalities for children in the EU.<sup>100</sup> Prevention is important because injury can have long term effects for individuals, whānau, and health and community services. Children and young people have been injured needlessly because effective interventions have not been implemented.

The following sections review the main causes of injury for 0–24 year olds using data from the National Minimum Dataset and the National Mortality Collection. The section concludes with a brief overview of local policy documents and evidence-based reviews which consider the prevention of injuries at the population level.

## Data sources and methods

### Indicators

*Deaths of 0–24 year olds from unintentional injury*

*Hospitalisations of 0–24 year olds for unintentional injury*

### Data sources

#### Numerators:

*Deaths:* National Mortality Collection

*Hospitalisations:* National Minimum Dataset

#### Denominator:

Statistics NZ Estimated Resident Population (with linear extrapolation being used to calculate denominators between Census years)

### Definition

Death of 0–24 year olds where the main underlying cause of death was an unintentional injury

Hospitalisation of 0–24 year olds with a primary diagnosis of injury (excluding cases involving intentional injury, complications of drugs/medical/surgical care and late sequelae of injury or where there was an Emergency Medicine Specialty code on discharge). Refer to **Appendix 6** for the codes included.

### Notes on interpretation

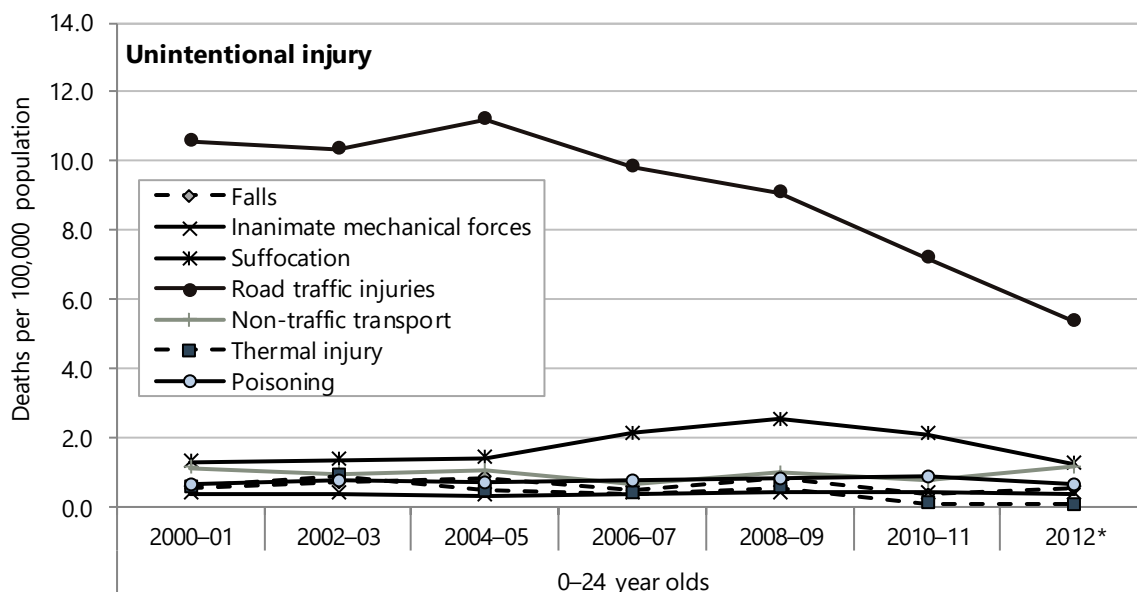
**Appendix 3** describes the National Minimum Dataset and outlines the limitations of the data utilised from this collection. Please read this appendix before interpreting any trends.

# National trends and distribution

Unintentional injury deaths fell consistently from 2008 to 2012. **Figure 1** shows the main causes of injury death for 0–24 year olds which indicates the reduction is predominantly as a result of a fall in the rate of road traffic

injury which began in 2006–07. The suffocation rate (most evident in under 1 year olds) rose from 2004–05 to 2008–09 before falling again. Suffocation occurred most commonly in bed and these events are included in Sudden Unexpected Death in Infancy (SUDI) (see [page Error! Bookmark not defined.](#)).

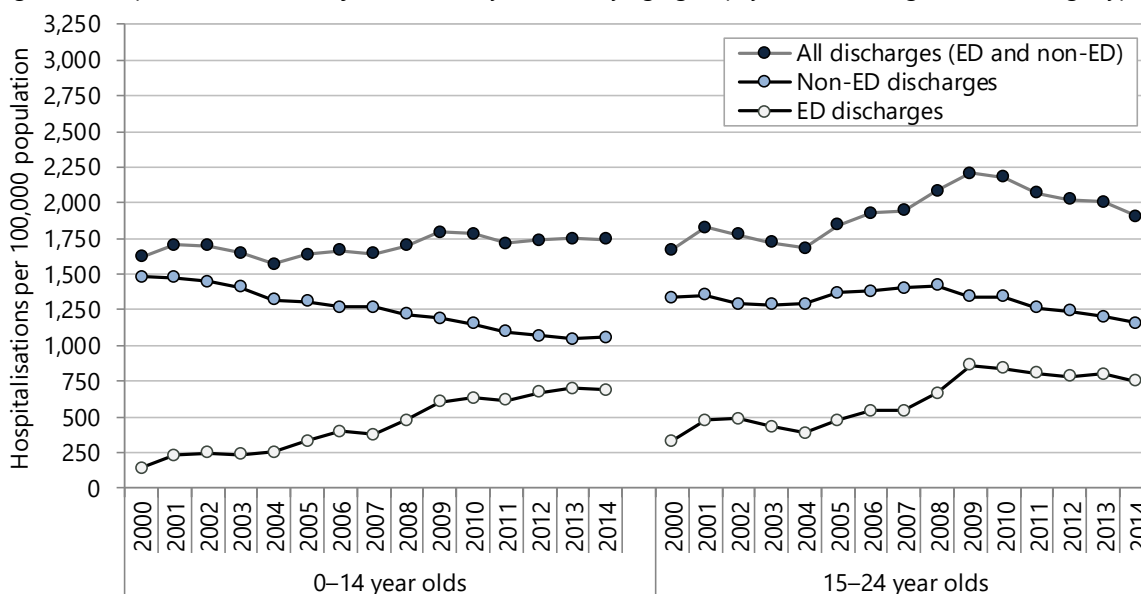
Figure 1. Deaths due to injuries in 0–24 year olds, by age group, year of discharge, and injury type, New Zealand, 2000–2012



Numerator: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population

From 2000 to 2014 the hospitalisation rate (excluding emergency department or ED discharges) for unintentional injury among 0–14 year olds fell steadily. For 15–24 year olds the rate remained stable in 2000–2008 and then fell (**Figure 2**). The ED only discharges rose over time for 0–14 year olds, but from 2009, the rate of ED only discharges fell for 15–24 year olds.

Figure 2. Hospitalisations from injuries in 0–24 year olds, by age group, year of discharge, and discharge type



Numerator: National Minimum Dataset (acute and arranged admissions); Denominator: Statistics NZ Estimated Resident Population

## Distribution by cause

From 2008 to 2012 there were 373 deaths of 0–14 year olds and 773 deaths of 15–24 year olds from unintentional injury; a total of 1,146 deaths. Among those aged 0–14 years, 40.2% were from suffocation (predominantly aged under 1 year), 22.0% from road traffic injuries (RTI), 12.3% from drowning and 10.7%

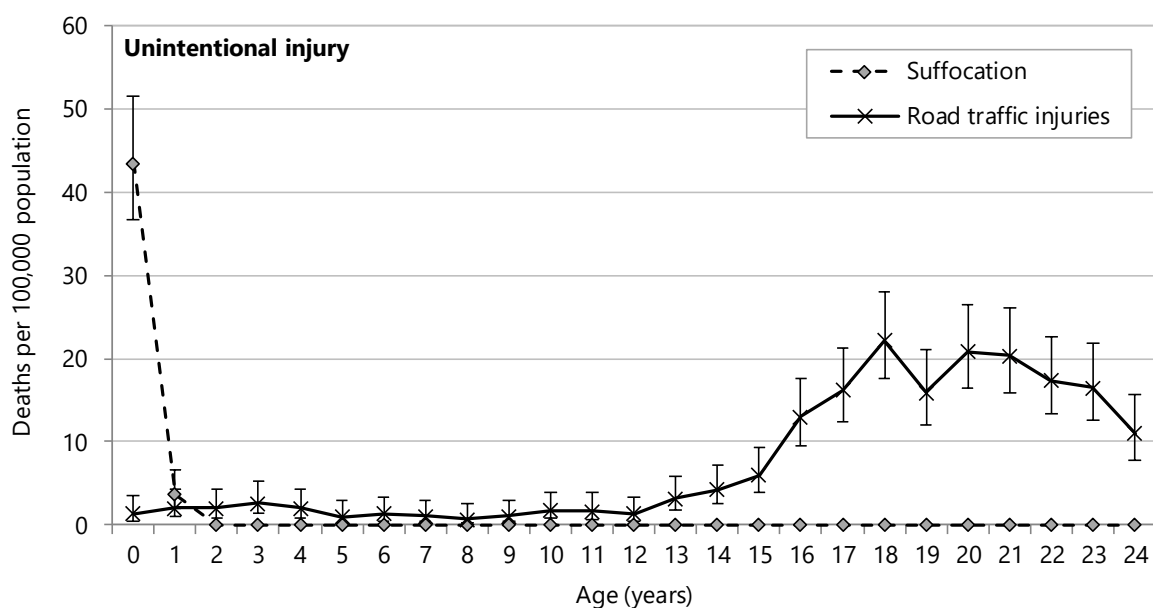
from non-traffic transport events. Among 15–24 year olds 63.8% were from RTI with 6.9% from poisoning and 6.5% from drowning (**Table 1, Figure 3**).

Table 1. Deaths due to unintentional injuries in 0–14 year olds, by age group and cause of injury, New Zealand, 2008–2012

Deaths by cause of unintentional injury	Number: 2008–2012	Number: annual average	Rate per 100,000 population	95% CI	Per cent
New Zealand					
0–14 year olds					
Suffocation	150	30	3.33	2.84–3.91	40.2
Road traffic crashes	82	16	1.82	1.47–2.26	22.0
Drowning or submersion	46	9	1.02	0.77–1.36	12.3
Non-traffic transport accidents	40	8	0.89	0.65–1.21	10.7
Inanimate mechanical forces	14	3	0.31	0.19–0.52	3.8
Thermal	11	2	0.24	0.14–0.44	2.9
Poisoning	9	2	0.20	0.11–0.38	2.4
Falls	7	1	0.16	0.08–0.32	1.9
Animate mechanical forces	<5	s	s	s	s
Other or unspecified land transport	<5	s	s	s	s
Other transport	<5	s	s	s	s
Other causes	8	2	0.18	0.09–0.35	2.1
Undetermined intent	0	s	s	s	s
Total	373	75	8.29	7.49–9.17	100.0
15–24 year olds					
Road traffic crashes	493	99	15.96	14.6–17.4	63.8
Poisoning	53	11	1.72	1.31–2.24	6.9
Drowning or submersion	50	10	1.62	1.23–2.13	6.5
Falls	38	8	1.23	0.90–1.69	4.9
Non-traffic transport accidents	31	6	1.00	0.71–1.42	4.0
Other transport	23	5	0.74	0.50–1.12	3.0
Inanimate mechanical forces	18	4	0.58	0.37–0.92	2.3
Suffocation	10	2	0.32	0.18–0.60	1.3
Thermal	10	2	0.32	0.18–0.60	1.3
Animate mechanical forces	<5	s	s	s	s
Other or unspecified land transport	<5	s	s	s	s
Other causes	42	8	1.36	1.01–1.84	5.4
Undetermined intent	0	..	..	..	..
Total	773	155	25.03	23.32–26.86	100.0

Numerator: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population

Figure 3. Deaths from selected unintentional injuries in 0–24 year olds, by age and injury type, New Zealand 2008–2012



Numerator: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population

Between 2010 and 2014, 45.1% of unintentional injury hospitalisations for 0–14 year olds were from falls and 23.5% were from inanimate mechanical forces (**Table 2**). For the 15–24 year olds, inanimate mechanical forces and falls comprised 26.6% and 25.6% respectively of the hospitalisations for injury (**Table 3**). More detailed discussion of hospitalisation data for specific types of injury follows later in this section.

Table 2. Hospitalisations from unintentional injuries in 0–14 year olds, by external cause of injury, New Zealand 2010–2014

Hospitalisations by main external cause of unintentional injury	Number: 2010–2014	Number: annual average	Rate per 100,000 population	95% CI	Per cent
New Zealand					
0–14 year olds					
Falls	22,130	4,426	488.60	482.22–495.07	45.1
Inanimate mechanical forces	11,560	2,312	255.23	250.63–259.92	23.5
Animate mechanical forces	2,949	590	65.11	62.80–67.50	6.0
Non-traffic transport accidents	2,393	479	52.83	50.76–54.99	4.9
Road traffic crashes	2,111	422	46.61	44.66–48.64	4.3
Other or unspecified land transport	711	142	15.70	14.59–16.89	1.4
Other transport	63	13	1.39	1.09–1.78	0.1
Thermal	1,965	393	43.38	41.51–45.35	4.0
Poisoning	1,792	358	39.57	37.78–41.44	3.6
Suffocation	441	88	9.74	8.87–10.69	0.9
Drowning or submersion	172	34	3.80	3.27–4.41	0.4
Other causes	2,563	513	56.59	54.44–58.82	5.2
Undetermined intent	253	51	5.59	4.94–6.32	0.5
Total	49,103	9,821	1,084.13	1,074.64–1,093.71	100.0

Numerator: National Minimum Dataset (acute and arranged admissions); Denominator: Statistics NZ Estimated Resident Population

Table 3. Hospitalisations from unintentional injuries in 15–24 year olds, by external cause of injury, New Zealand 2010–2014

Hospitalisations by main external cause of unintentional injury	Number: 2010–2014	Number: annual average	Rate per 100,000 population	95% CI	Per cent
New Zealand					
15–24 year olds					
Inanimate mechanical forces	10,299	2,060	330.00	323.70–336.43	26.6
Falls	9,913	1,983	317.63	311.45–323.94	25.6
Road traffic crash	5,801	1,160	185.88	181.16–190.72	15.0
Animate mechanical forces	3,360	672	107.66	104.08–111.36	8.7
Non-traffic transport incidents	2,710	542	86.83	83.63–90.16	7.0
Other or unspecified land transport	736	147	23.58	21.94–25.35	1.9
Other transport	164	33	5.25	4.51–6.12	0.4
Thermal	759	152	24.32	22.65–26.11	2.0
Poisoning	504	101	16.15	14.80–17.62	1.3
Suffocation	56	11	1.79	1.38–2.33	0.1
Drowning or submersion	35	7	1.12	0.81–1.56	0.1
Other causes	3,705	741	118.72	114.96–122.60	9.6
Undetermined intent	677	135	21.69	20.12–23.39	1.7
Total	38,719	7,744	1,240.64	1,228.42–1,252.98	100.0

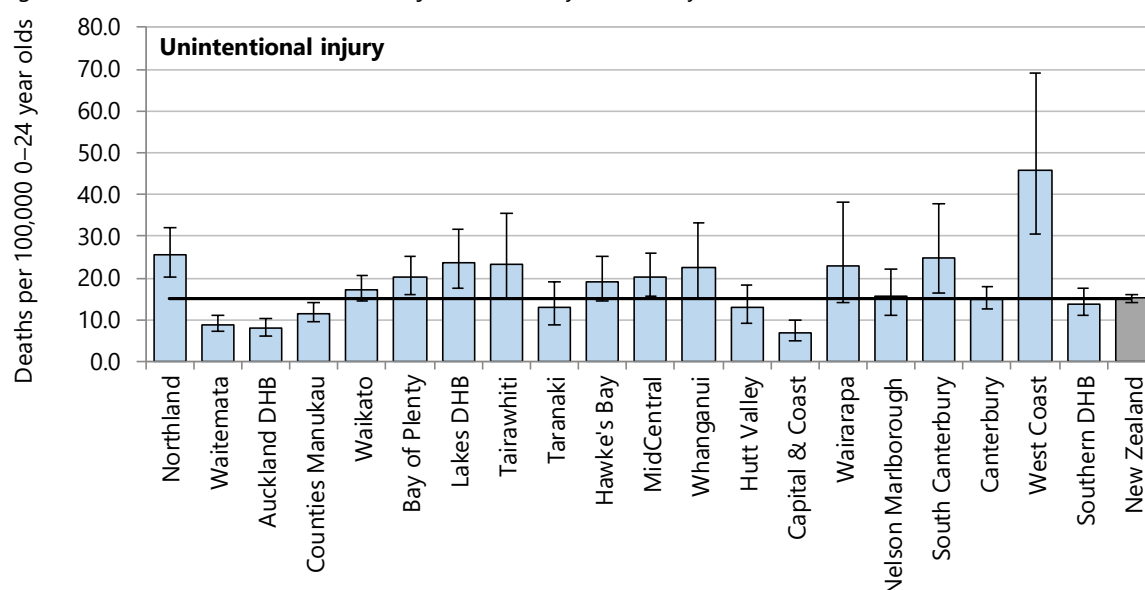
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## Distribution by region

From 2008 to 2012 deaths due to unintentional injury were *significantly higher* than the overall national rate in Northland, Bay of Plenty, Lakes, MidCentral, South Canterbury and West Coast while rates in Waitemata, Auckland, Counties Manukau, and Capital & Coast DHBs were *significantly lower* than the national rate. In the remaining DHBs there was *no significant difference* from the national rate (**Figure 4**).

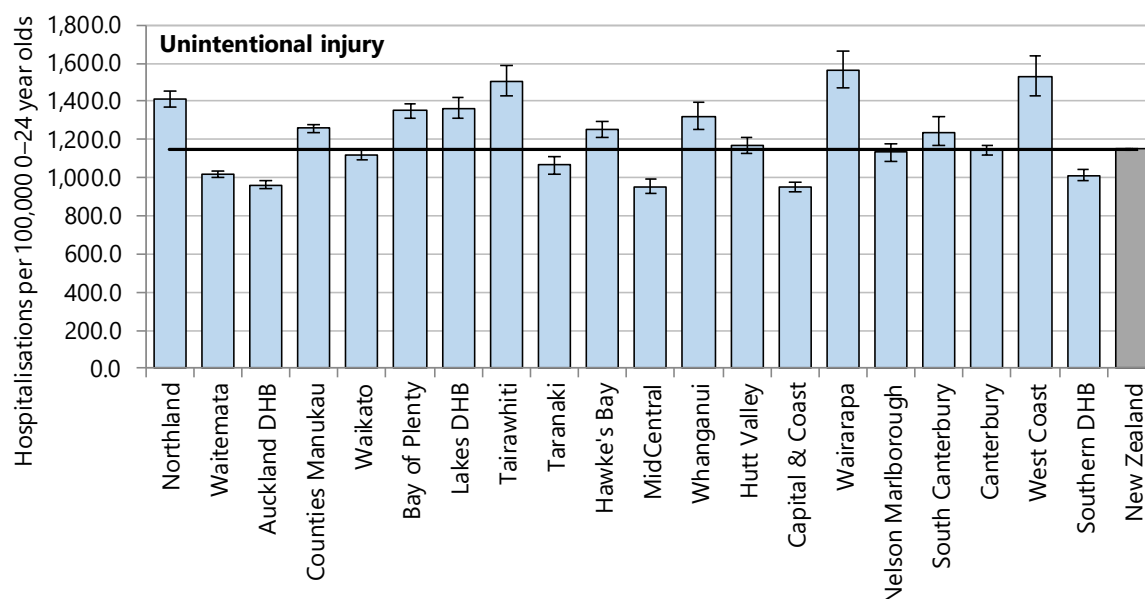
From 2010 to 2014 injury hospitalisation rates in Northland, Counties Manukau, Bay of Plenty, Lakes, Tairāwhiti, Hawke's Bay, Whanganui, Wairarapa, South Canterbury, and West Coast were *significantly higher* than the national rate. Rates for Waitemata, Auckland, Taranaki, MidCentral, Capital & Coast, and Southern DHBs were *significantly lower* than the overall national rate. In the remaining DHBs there was *no significant difference* from the national rate (**Figure 5**).

Figure 4. Deaths due to unintentional injuries in 0–24 year olds, by district health board, New Zealand 2008–2012



Numerator: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population

Figure 5. Hospitalisations for unintentional injuries in 0–24 year olds, by district health board, New Zealand 2010–2014

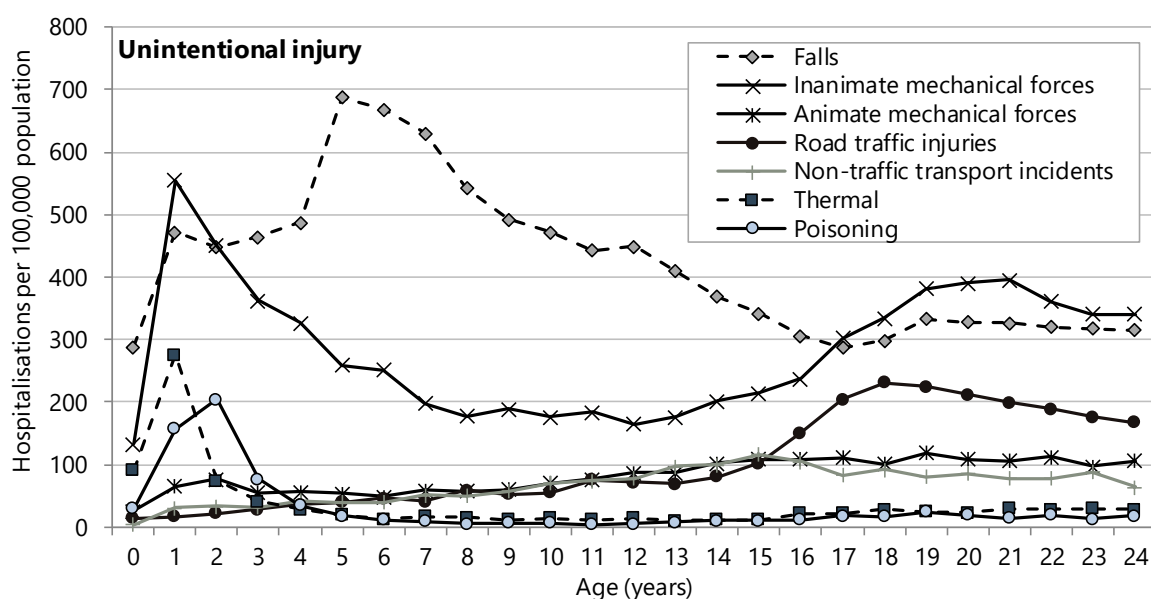


Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population

## Distribution by demographic factors

Certain causes of unintentional injury have noticeable age distributions. Injury hospitalisation rates for falls, inanimate mechanical forces (which includes struck against or by, caught between, contact with sharp items, machinery), thermal, and poisoning peak around ages 1 to 2 years. Inanimate mechanical forces, road traffic crashes, and falls are the most common causes of injury among those older than 15 years. Both non-traffic land transport and animate mechanical forces injury hospitalisation rates gradually increase with increasing age from about 4 years (Figure 6).

Figure 6. Hospitalisations from selected unintentional injuries in 0–24 year olds, by age and injury type, New Zealand 2010–2014



Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population

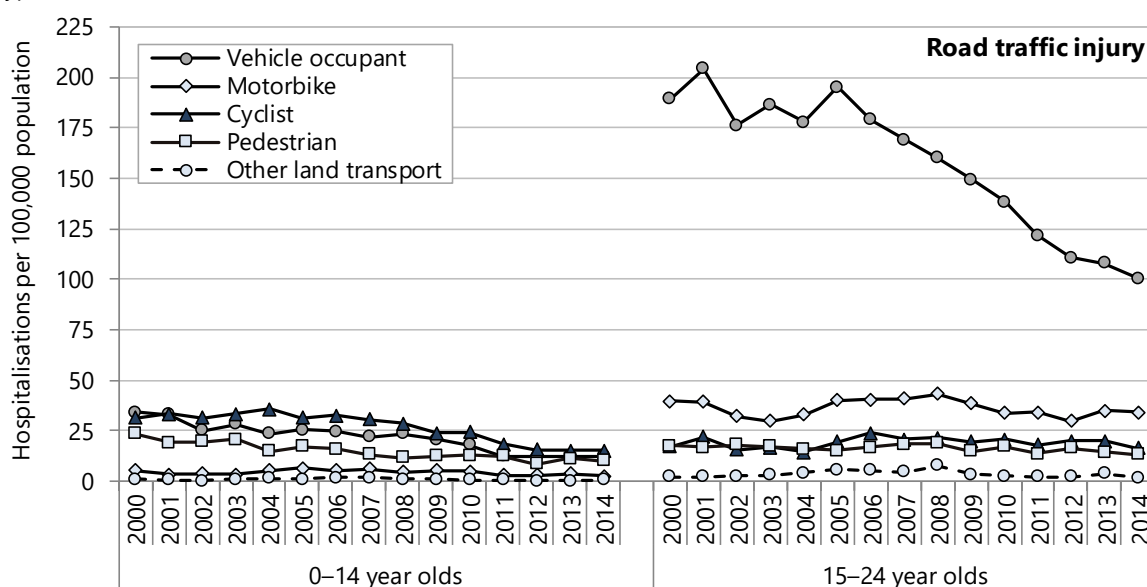


## Road traffic injury

Death rates from road traffic injuries rates fell steeply from 10.59 deaths per 100,000 0–24 year olds in 2000–01 to 5.36 in 2012 and most of this fall has occurred since 2004 (**Figure 1**). Between 2008 and 2012 there were 82 deaths of 0–14 year olds and 493 deaths of 15–24 year olds as a result of road traffic injury (RTI). In both 0–14 and 15–24 age groups the deceased was most commonly a vehicle occupant or a pedestrian. For 15–24 year olds motorbike injury deaths were equal to pedestrian deaths (**Table 1**).

From 2000 to 2014 hospitalisation rates for RTI fell and this was mainly attributable to a steep fall in hospitalisation rates of 15–24 year olds as a vehicle occupant in a road traffic crash, although over the whole time period hospitalisation rates were consistently highest for this type of RTI in this age group. Hospitalisation rates for pedestrian injury also fell for 15–24 year olds, whereas rates for motorbike and pedestrian injury were more variable. For 0–14 year olds there was a slight steady fall in all types of RTI hospitalisations as a vehicle occupant, cyclist, pedestrian or on a motorbike. In this age group hospitalisation rates for cyclist RTI were consistently higher than for other types of RTI (**Figure 7**).

Figure 7. Hospitalisations from road traffic injuries in 0–24 year olds, by age group, year of discharge, and RTI type, New Zealand 2000–2014



Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population

## Distribution by cause

There were 2,111 hospitalisations of 0–14 year olds and 5,801 hospitalisations of 15–24 year olds for RTI between 2010 and 2014. The most common types of RTI hospitalisation for 0–14 year olds were as cyclists, vehicle occupants and pedestrian. The most common types of RTI for 15–24 year olds were as vehicle occupant, motorbike, and cyclist (**Table 4**).

Table 4. Hospitalisations from road traffic injuries in 0–24 year olds, by age group, New Zealand 2010–2014

Cause of injury: road traffic crashes	Number: 2010–2014	Number: annual average	Rate per 100,000 population	95% CI	Per cent
New Zealand					
0–14 year olds					
Vehicle occupant	619	124	13.67	12.63–14.79	29.3
Motorbike	160	32	3.53	3.03–4.12	7.6
Cyclist	805	161	17.77	16.59–19.04	38.1
Pedestrian	504	101	11.13	10.20–12.14	23.9
Other land transport	23	5	0.51	0.34–0.76	1.1
Total	2,111	422	46.61	44.66–48.64	100.0
15–24 year olds					
Vehicle occupant	3,615	723	115.83	112.12–119.67	62.3
Motorbike	1,044	209	33.45	31.48–35.54	18.0
Cyclist	597	119	19.13	17.66–20.73	10.3
Pedestrian	469	94	15.03	13.73–16.45	8.1
Other land transport	76	15	2.44	1.95–3.05	1.3
Total	5,801	1,160	185.88	181.16–190.72	100.0

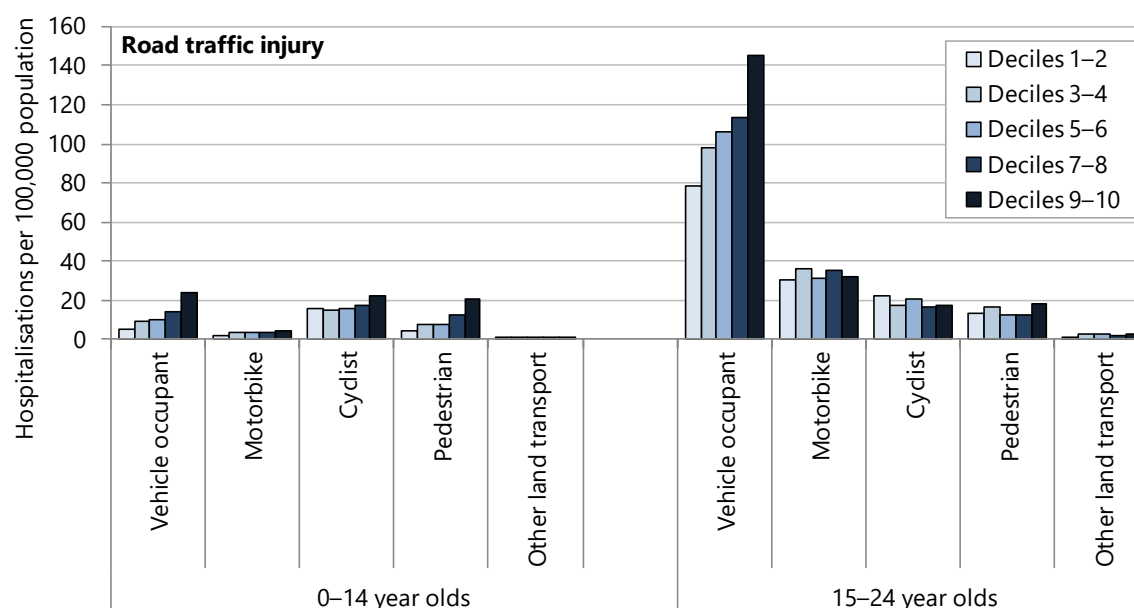
Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population

## Distribution by demographic factors

The patterns of RTI hospitalisation varied by age group (**Figure 8**). Hospitalisation rates as a result of vehicle occupant injury were highest at ages 15–19 (115.2 per 100,000 age-specific population) and 20–24 years (116.5) where rates for 0–4 years was 10.7. Across the age groups, motorbike injury rates were highest at age 20–24 years (39.4); cyclist injuries were highest at age 10–14 years although within age groups, cycling injuries were also the highest RTI for 5–9 years. Pedestrian was the highest cause of RTI for 0–4 year olds (**Between 2010 and 2014** disparities in RTI hospitalisation rates by NZDep2013 score, ethnicity and gender varied according to the type of RTI. The strongest social gradients were seen in vehicle occupant injuries in 0–14 and 15–24 year olds where hospitalisation rates were *significantly higher* for areas with higher deprivation index scores (NZDep2013 deciles 3–10) compared with low deprivation score areas (deciles 1–2) (**Table 6**). Although numbers were small, motorbike injury hospitalisation rates were *significantly higher* for 0–14 year olds in areas with the highest deprivation scores (deciles 9–10) compared with lower scoring areas (deciles 1–8) but there was *no significant difference* by NZDep2013 scores for motorbike injury in 15–24 year olds (**Table 7**). Cycle injury hospitalisation rates for 0–14 year olds were in *significantly higher* in NZDep2013 deciles 9–10 compared with deciles 1–2, but in 0–24 year olds the gradient reversed with *significantly lower* rates in NZDep2013 deciles 7–10 compared with deciles 1–2 (**Table 8**). Hospitalisation rates for 0–14 year old pedestrian injury were *significantly higher* for NZDep2013 deciles 3–10 compared to those in decile 1–2 whereas for 15–24 year olds the rate was *significantly higher* only in areas with the highest NZDep2013 scores (deciles 9–10) (**Table 9**).

Table 5).

Figure 8. Hospitalisations from road traffic injuries in 0–24 year olds, by NZ Deprivation quintile, New Zealand 2010–2014



Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; Decile is NZDep2013

Between 2010 and 2014 disparities in RTI hospitalisation rates by NZDep2013 score, ethnicity and gender varied according to the type of RTI. The strongest social gradients were seen in vehicle occupant injuries in 0–14 and 15–24 year olds where hospitalisation rates were *significantly higher* for areas with higher deprivation index scores (NZDep2013 deciles 3–10) compared with low deprivation score areas (deciles 1–2) (**Table 6**). Although numbers were small, motorbike injury hospitalisation rates were *significantly higher* for 0–14 year olds in areas with the highest deprivation scores (deciles 9–10) compared with lower scoring areas (deciles 1–8) but there was *no significant difference* by NZDep2013 scores for motorbike injury in 15–24 year olds (**Table 7**). Cycle injury hospitalisation rates for 0–14 year olds were *significantly higher* in NZDep2013 deciles 9–10 compared with deciles 1–2, but in 0–24 year olds the gradient reversed with *significantly lower* rates in NZDep2013 deciles 7–10 compared with deciles 1–2 (**Table 8**). Hospitalisation rates for 0–14 year old pedestrian injury were *significantly higher* for NZDep2013 deciles 3–10 compared to those in decile 1–2 whereas for 15–24 year olds the rate was *significantly higher* only in areas with the highest NZDep2013 scores (deciles 9–10) (**Table 9**).

Table 5. Hospitalisations from road traffic crash injuries in 0–24 year olds, by 5-year age group, New Zealand 2010–2014

Cause of injury: road traffic crashes	Number: 2010–2014	Number: annual average	Rate per 100,000 population	95% CI	Per cent
New Zealand					
0–4 year olds					
Vehicle occupant	165	33	10.71	9.19–12.47	46.5
Motorbike	7	1	0.45	0.22–0.94	2.0
Cyclist	53	11	3.44	2.63–4.50	14.9
Pedestrian	126	25	8.18	6.87–9.73	35.5
Other land transport	<5	s	s	s	s
Total	355	71	23.03	20.76–25.56	100.0
5–9 year olds					
Vehicle occupant	204	41	13.65	11.90–15.66	28.9
Motorbike	36	7	2.41	1.74–3.33	5.1
Cyclist	273	55	18.27	16.22–20.57	38.7
Pedestrian	190	38	12.71	11.03–14.65	27.0
Other land transport	<5	s	s	s	s
Total	705	141	47.17	43.82–50.79	100.0
10–14 year olds					
Vehicle occupant	250	50	16.74	14.79–18.95	23.8
Motorbike	117	23	7.83	6.54–9.39	11.1
Cyclist	479	96	32.07	29.32–35.07	45.6
Pedestrian	188	38	12.59	10.91–14.52	17.9
Other land transport	17	3	1.14	0.71–1.82	1.6
Total	1,051	210	70.37	66.24–74.75	100.0
15–19 year olds					
Vehicle occupant	1,801	360	115.21	110.01–120.65	63.1
Motorbike	430	86	27.51	25.03–30.23	15.1
Cyclist	349	70	22.33	20.10–24.79	12.2
Pedestrian	242	48	15.48	13.65–17.56	8.5
Other land transport	34	7	2.17	1.56–3.04	1.2
Total	2,856	571	182.70	176.12–189.52	100.0
20–24 year olds					
Vehicle occupant	1,814	363	116.46	111.22–121.94	61.6
Motorbike	614	123	39.42	36.42–42.66	20.8
Cyclist	248	50	15.92	14.06–18.03	8.4
Pedestrian	227	45	14.57	12.80–16.60	7.7
Other land transport	42	8	2.70	1.99–3.64	1.4
Total	2,945	589	189.07	182.37–196.01	100.0

Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population

Compared with European/Other, vehicle occupant RTI hospitalisation rates were *significantly higher* for Māori aged 0–14 years and 15–24 years and *significantly lower* for Pacific and Asian/Indian aged 15–24 years. Motorbike rates were *significantly lower* for Māori, Pacific and Asian/Indian aged 15–24 years. Cyclist rates were *significantly lower* for Asian/Indian aged 0–14 years and for Māori, Pacific and Asian/Indian aged 15–24 years; and pedestrian rates were *significantly higher* for Māori aged 0–24 years and Pacific and MELAA aged 0–14 years (**Table 6, Table 7, Table 8, Table 9**).

Hospitalisation rates were *significantly higher* for males than females in the 0–14 and 15–24 year age groups for all types of road traffic injury except for injury as a vehicle occupant where there was *no significant difference* by gender in 0–14 year olds. The disparity by gender was most marked for motorbike injuries (**Table 6, Table 7, Table 8, and Table 9**).

Table 6. Hospitalisations for vehicle occupant-related road traffic injuries in 0–24 year olds, by age group and demographic factor, New Zealand 2010–2014

Variable	Number: 2010–2014	Rate per 100,000 population	Rate ratio	95% CI
Road traffic injuries: vehicle occupant				
0–14 year olds				
NZ Deprivation Index quintile				
Deciles 1–2	49	5.62	1.00	
Deciles 3–4	73	9.04	1.61	1.12–2.31
Deciles 5–6	88	10.29	1.83	1.29–2.59
Deciles 7–8	137	14.58	2.59	1.87–3.59
Deciles 9–10	256	24.26	4.32	3.18–5.86
Prioritised ethnicity				
Māori	272	23.60	2.42	2.03–2.88
Pacific	51	11.72	1.20	0.89–1.63
Asian/Indian	54	11.34	1.16	0.86–1.56
MELAA	<5	s	s	s
European/Other	235	9.75	1.00	
Gender				
Female	311	14.09	1.00	
Male	308	13.27	0.94	0.80–1.10
15–24 year olds				
NZ Deprivation Index quintile				
Deciles 1–2	416	78.31	1.00	
Deciles 3–4	514	98.44	1.26	1.10–1.43
Deciles 5–6	618	106.19	1.36	1.20–1.54
Deciles 7–8	771	113.33	1.45	1.28–1.63
Deciles 9–10	1,172	145.60	1.86	1.66–2.08
Prioritised ethnicity				
Māori	1,021	161.96	1.40	1.30–1.51
Pacific	266	100.15	0.87	0.76–0.99
Asian/Indian	274	59.32	0.51	0.45–0.58
MELAA	41	96.63	0.84	0.62–1.14
European/Other	1,984	115.32	1.00	
Gender				
Female	1,508	98.29	1.00	
Male	2,107	132.79	1.35	1.26–1.44

Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; Rate ratios are unadjusted; Ethnicity is level 1 prioritised; Decile is NZDep2013

Table 7. Hospitalisations for motorbike-related road traffic injuries in 0–24 year olds, by age group and demographic factor, New Zealand 2010–2014

Variable	Number: 2010–2014	Rate per 100,000 population	Rate ratio	95% CI
Road traffic injuries: motorbike				
0–14 year olds				
NZ Deprivation Index quintile				
Deciles 1–2	19	2.18	1.00	
Deciles 3–4	29	3.59	1.65	0.92–2.94
Deciles 5–6	31	3.62	1.66	0.94–2.94
Deciles 7–8	35	3.72	1.71	0.98–2.99
Deciles 9–10	46	4.36	2.00	1.17–3.41
Prioritised ethnicity				
Māori	50	4.34	1.00	0.71–1.39
Pacific	<5	s	s	s
Asian/Indian	<5	s	s	s
MELAA	0	..	..	..
European/Other	105	4.36	1.00	
Gender				
Female	21	0.95	1.00	
Male	139	5.99	6.29	3.98–9.96
15–24 year olds				
NZ Deprivation Index quintile				
Deciles 1–2	162	30.49	1.00	
Deciles 3–4	189	36.20	1.19	0.96–1.46
Deciles 5–6	184	31.62	1.04	0.84–1.28
Deciles 7–8	238	34.98	1.15	0.94–1.40
Deciles 9–10	256	31.80	1.04	0.86–1.27
Prioritised ethnicity				
Māori	215	34.10	0.79	0.68–0.92
Pacific	33	12.42	0.29	0.20–0.41
Asian/Indian	33	7.14	0.17	0.12–0.23
MELAA	12	28.28	0.66	0.37–1.16
European/Other	742	43.13	1.00	
Gender				
Female	133	8.67	1.00	
Male	911	57.41	6.62	5.52–7.94

Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; Rate ratios are unadjusted; Ethnicity is level 1 prioritised; Decile is NZDep2013

Table 8. Hospitalisations for cyclist-related road traffic injuries in 0–24 year olds, by age group and demographic factor, New Zealand 2010–2014

Variable	Number: 2010–2014	Rate per 100,000 population	Rate ratio	95% CI
Road traffic injuries: cyclist				
0–14 year olds				
NZ Deprivation Index quintile				
Deciles 1–2	139	15.95	1.00	
Deciles 3–4	121	14.99	0.94	0.74–1.20
Deciles 5–6	138	16.13	1.01	0.80–1.28
Deciles 7–8	166	17.66	1.11	0.88–1.39
Deciles 9–10	236	22.37	1.40	1.14–1.73
Prioritised ethnicity				
Māori	222	19.27	1.05	0.90–1.24
Pacific	69	15.86	0.87	0.67–1.12
Asian/Indian	61	12.80	0.70	0.54–0.91
MELAA	10	17.97	0.98	0.52–1.84
European/Other	441	18.30	1.00	
Gender				
Female	217	9.83	1.00	
Male	588	25.33	2.58	2.20–3.01
15–24 year olds				
NZ Deprivation Index quintile				
Deciles 1–2	120	22.59	1.00	
Deciles 3–4	92	17.62	0.78	0.59–1.02
Deciles 5–6	119	20.45	0.91	0.70–1.17
Deciles 7–8	114	16.76	0.74	0.57–0.96
Deciles 9–10	138	17.14	0.76	0.59–0.97
Prioritised ethnicity				
Māori	96	15.23	0.59	0.47–0.74
Pacific	19	7.15	0.28	0.18–0.44
Asian/Indian	26	5.63	0.22	0.15–0.32
MELAA	8	18.86	0.73	0.36–1.47
European/Other	443	25.75	1.00	
Gender				
Female	124	8.08	1.00	
Male	473	29.81	3.69	3.03–4.49

Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; Rate ratios are unadjusted; Ethnicity is level 1 prioritised; Decile is NZDep2013

Table 9. Hospitalisations for pedestrian-related road traffic crash injuries in 0–24 year olds, by age group and demographic factor, New Zealand 2010–2014

Variable	Number: 2010–2014	Rate per 100,000 population	Rate ratio	95% CI
Road traffic injuries: pedestrian				
0–14 year olds				
NZ Deprivation Index quintile				
Deciles 1–2	40	4.59	1.00	
Deciles 3–4	62	7.68	1.67	1.12–2.49
Deciles 5–6	67	7.83	1.71	1.15–2.52
Deciles 7–8	115	12.24	2.67	1.86–3.82
Deciles 9–10	217	20.57	4.48	3.20–6.28
Prioritised ethnicity				
Māori	187	16.23	2.31	1.88–2.85
Pacific	102	23.44	3.34	2.61–4.27
Asian/Indian	33	6.93	0.99	0.68–1.43
MELAA	10	17.97	2.56	1.35–4.85
European/Other	169	7.01	1.00	
Gender				
Female	164	7.43	1.00	
Male	340	14.64	1.97	1.64–2.37
15–24 year olds				
NZ Deprivation Index quintile				
Deciles 1–2	70	13.18	1.00	
Deciles 3–4	87	16.66	1.26	0.92–1.73
Deciles 5–6	73	12.54	0.95	0.69–1.32
Deciles 7–8	84	12.35	0.94	0.68–1.29
Deciles 9–10	147	18.26	1.39	1.04–1.84
Prioritised ethnicity				
Māori	132	20.94	1.55	1.25–1.91
Pacific	47	17.70	1.31	0.96–1.79
Asian/Indian	49	10.61	0.78	0.58–1.07
MELAA	6	14.14	1.04	0.46–2.35
European/Other	233	13.54	1.00	
Gender				
Female	173	11.28	1.00	
Male	296	18.65	1.65	1.37–2.00

Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; Rate ratios are unadjusted; Ethnicity is level 1 prioritised; Decile is NZDep2013

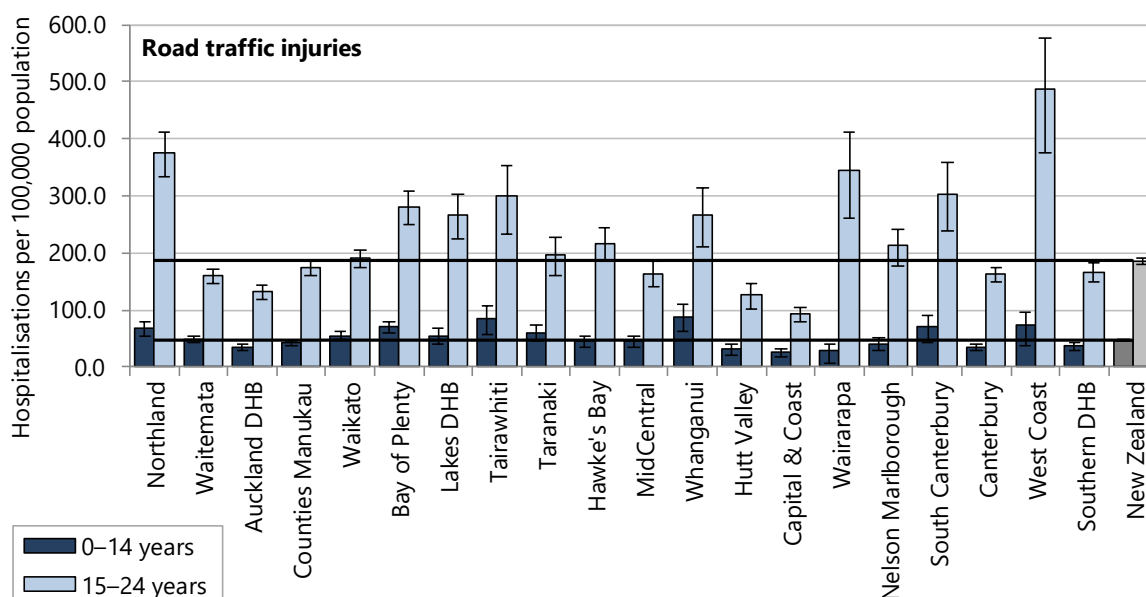


## Distribution by region

For 0–14 year olds, the RTI hospitalisation rates were *significantly higher* than the national rate in the Northland, Waikato, Bay of Plenty, Tairāwhiti, Taranaki, Whanganui, South Canterbury and West Coast DHBs and *significantly lower* in the Auckland, Hutt Valley, Capital & Coast, Canterbury and Southern DHBs. In remaining district health boards there was *no significant difference* from the national rate.

For 15–24 year olds the RTI hospitalisation rates were *significantly higher* than the national rate in the Northland, Bay of Plenty, Lakes, Tairāwhiti, Hawke's Bay, Whanganui, Wairarapa, South Canterbury and West Coast DHBs and *significantly lower* in the Waitemata, Auckland, Hutt Valley, Capital & Coast, Canterbury and Southern DHBs. In remaining district health boards there was *no significant difference* from the national rate (**Figure 9**).

Figure 9. Hospitalisations for injuries from road traffic crash, by district health board, New Zealand 2010–2014



Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population

## Falls

There are few injury deaths resulting from falls among those aged 0–24 years. Between 2008 and 2012 there were 7 deaths of 0–14 year olds and 38 deaths of 15–24 year olds (**Table 1**). Falls were the most common reason for unintentional injury hospitalisation among 0–24 year olds and between 2010 and 2014 there were 22,130 hospitalisations of 0–14 year olds for injury from falls, more than twice the 9,913 hospitalisations for 15–24 year olds (**Table 2, Table 3**).

## Distribution by cause

The most common types of fall resulting in hospitalisation for 0–14 year olds were falls involving playground equipment and falls on the same level. For 15–24 year olds the most common type was fall on same level due to collision with, or pushing by, another person (**Table 10**). Falls from playground equipment occurred most commonly in schools.

Table 10. Hospitalisations from fall-related injuries in 0–24 year olds, by age group and cause of injury, New Zealand 2010–2014

Cause of injury: falls	Number: 2010–2014	Number: annual average	Rate per 100,000 population	95% CI	Per cent
New Zealand					
0–14 year olds					
Fall involving playground equipment	7,023	1,405	155.06	151.48–158.73	31.7
Fall on same level from slipping, tripping and stumbling	2,432	486	53.70	51.60–55.87	11.0
Fall involving ice-skates, skis, rollerskates or skateboards	2,110	422	46.59	44.64–48.62	9.5
Other fall on same level	1,581	316	34.91	33.23–36.67	7.1
Fall from, out of or through building or structure	1,244	249	27.47	25.98–29.04	5.6
Other fall on same level due to collision with, or pushing by, another person	1,243	249	27.44	25.96–29.01	5.6
Other fall from one level to another	1,303	261	28.77	27.25–30.37	5.9
Fall from tree	918	184	20.27	19.00–21.62	4.1
Fall involving chair	1,035	207	22.85	21.50–24.29	4.7
Fall involving bed	875	175	19.32	18.08–20.64	4.0
Fall on and from stairs and steps	621	124	13.71	12.67–14.83	2.8
Fall while being carried or supported by other persons	402	80	8.88	8.05–9.79	1.8
Fall involving other furniture	294	59	6.49	5.79–7.28	1.3
Fall from cliff	119	24	2.63	2.20–3.14	0.5
Diving or jumping into water causing injury*	104	21	2.30	1.90–2.78	0.5
Fall on and from ladder	96	19	2.12	1.74–2.59	0.4
Other specified falls	33	7	0.73	0.52–1.02	0.1
Unspecified fall	697	139	15.39	14.29–16.57	3.1
Total	22,130	4,426	488.60	482.22–495.07	100.0
15–24 year olds					
Other fall on same level due to collision with, or pushing by, another person	2,021	404	64.76	62.00–67.64	20.4
Fall on same level from slipping, tripping and stumbling	1,627	325	52.13	49.66–54.73	16.4
Fall involving ice-skates, skis, rollerskates or skateboards	1,574	315	50.43	48.00–52.99	15.9
Other fall on same level	1,107	221	35.47	33.44–37.62	11.2
Fall from, out of or through building or structure	826	165	26.47	24.72–28.33	8.3
Fall on and from stairs and steps	669	134	21.44	19.87–23.12	6.7
Other fall from one level to another	586	117	18.78	17.32–20.36	5.9
Fall from cliff	243	49	7.79	6.87–8.83	2.5
Fall involving playground equipment	227	45	7.27	6.39–8.28	2.3
Diving or jumping into water causing injury*	165	33	5.29	4.54–6.16	1.7
Fall on and from ladder	109	22	3.49	2.90–4.21	1.1
Fall from tree	108	22	3.46	2.87–4.18	1.1
Fall involving chair	63	13	2.02	1.58–2.58	0.6
Fall while being carried or supported by other persons	49	10	1.57	1.19–2.08	0.5
Fall involving bed	36	7	1.15	0.83–1.60	0.4
Fall involving other furniture	24	5	0.77	0.52–1.14	0.2
Other specified falls	56	11	1.79	1.38–2.33	0.6
Unspecified fall	423	85	13.55	12.32–14.91	4.3
Total	9,913	1,983	317.63	311.45–323.94	100.0

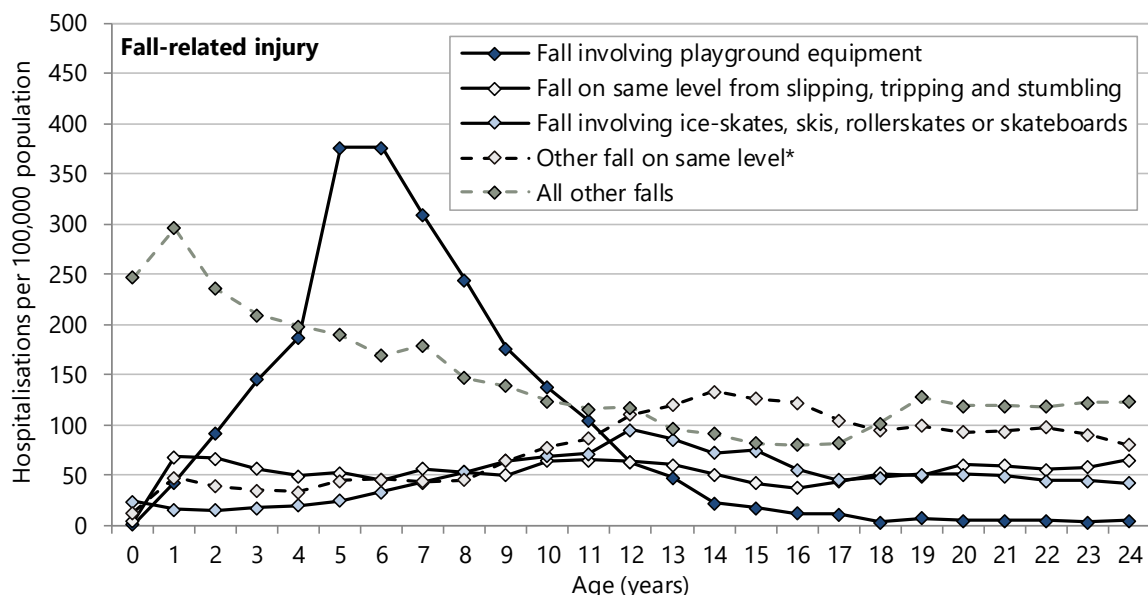
Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; \* Diving or jumping into water causing injury other than drowning or submersion

## Distribution by demographic factors

Patterns of fall-related hospitalisation rates by age show a very high rate of falls involving playground equipment peaking at age 5–6 years and then falling steeply with increasing age. Rates for falls on same level

due to collision with or pushing by another person began to rise from age nine years and remained at relatively high levels through the teenage years. Rates for falls involving skates, skis or skateboards rose until age 13 and then fell with increasing age. Other types of fall had highest rates at age one year and then tended to fall with increasing age until rising again from age 18–19 years (Figure 10).

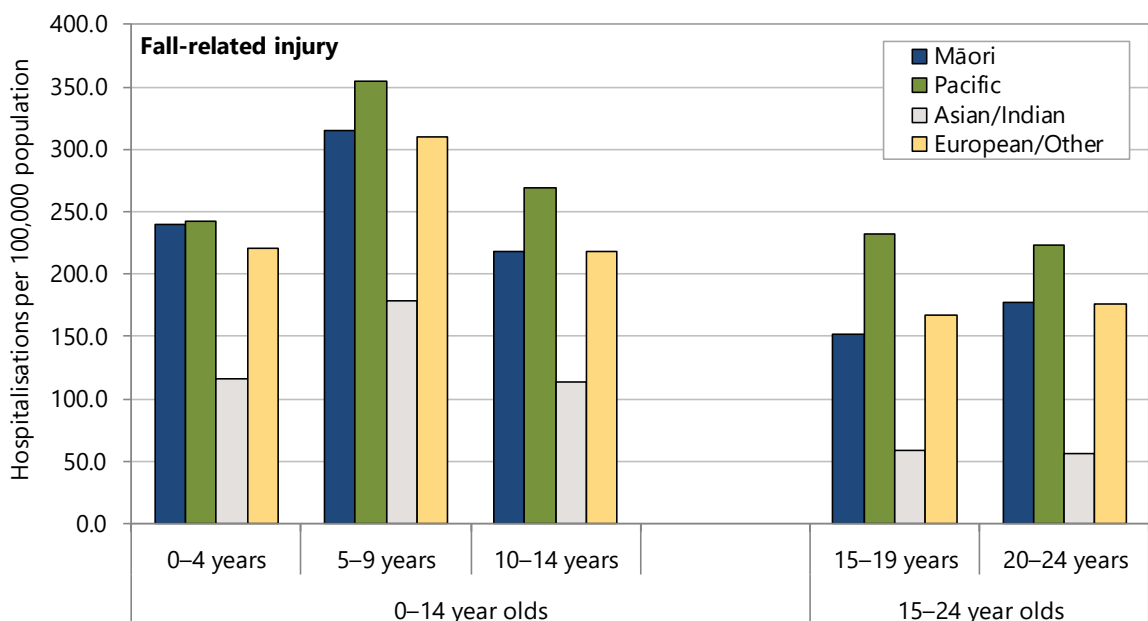
Figure 10. Hospitalisations from fall-related injuries in 0–24 year olds, by age and fall type, New Zealand 2010–2014



Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; Rates per 100,000 age-specific population; \* Other fall on same level relates to other fall on same level due to collision with, or pushing by, another person

Fall-related injury hospitalisation rates were highest at age 5–9 years for all ethnic groups, with rates for Pacific generally higher and rates for Asian/Indian consistently lower than rates for European/Other and Māori (Figure 11). This peak in rates in 5–9 year olds is mainly due to falls involving playground equipment.

Figure 11. Hospitalisations from fall-related injuries in 0–24 year olds, by age and ethnicity, New Zealand 2010–2014



Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; Ethnicity is level 1 prioritised

Between 2010 and 2014 in 0–14 year olds there was some disparity in hospitalisation rates for fall injury involving playground equipment by NZDep2013 index of deprivation score and ethnicity. Rates were *significantly higher* in areas with the highest deprivation scores (NZDep2013 deciles 9–10) compared with areas with lower deprivation scores (deciles 1–8). Rates were *significantly lower* for Asian/Indian than rates for European/Other, Māori, Pacific and MELAA. There was *no significant difference* between male and female rates (**Table 11**).

In the same time period for 15–24 year olds there was similar disparity by NZDep2013 score for falls on the same level due to collision with or pushing by another person with *significantly higher* injury hospitalisation rates in areas with the highest deprivation scores (NZDep2013 deciles 9–10) compared with areas with lower deprivation scores (deciles 1–8). Compared with European/Other, rates for this form of injury were *significantly higher* for Māori and Pacific and *significantly lower* for Asian/Indian and *no significant difference* for MELAA (**Table 11**).

Table 11. Hospitalisations for fall-related injuries in 0–24 year olds, by age group and demographic factor, New Zealand 2010–2014

Variable	Number: 2010–2014	Rate per 100,000 population	Rate ratio	95% CI
New Zealand				
Falls among 0–14 year olds involving playground equipment				
NZ Deprivation Index quintile				
Deciles 1–2	1,217	139.65	1.00	
Deciles 3–4	1,114	138.01	0.99	0.91–1.07
Deciles 5–6	1,149	134.34	0.96	0.89–1.04
Deciles 7–8	1,344	143.00	1.02	0.95–1.11
Deciles 9–10	2,135	202.36	1.45	1.35–1.55
Prioritised ethnicity				
Māori	1,917	166.36	1.06	1.00–1.12
Pacific	740	170.04	1.08	1.00–1.17
Asian/Indian	452	94.88	0.60	0.55–0.66
MELAA	82	147.33	0.93	0.75–1.16
European/Other	3,797	157.59	1.00	
Gender				
Female	3,359	152.17	1.00	
Male	3,664	157.81	1.04	0.99–1.09
Injuries among 15–24 year olds from other fall on same level*				
NZ Deprivation Index quintile				
Deciles 1–2	289	54.40	1.00	
Deciles 3–4	319	61.10	1.12	0.96–1.32
Deciles 5–6	347	59.62	1.10	0.94–1.28
Deciles 7–8	378	55.56	1.02	0.88–1.19
Deciles 9–10	673	83.61	1.54	1.34–1.76
Prioritised ethnicity				
Māori	483	76.62	1.45	1.29–1.61
Pacific	534	201.05	3.79	3.41–4.22
Asian/Indian	58	12.56	0.24	0.18–0.31
MELAA	16	37.71	0.71	0.43–1.17
European/Other	912	53.01	1.00	
Gender				
Female	158	10.30	1.00	
Male	1,863	117.41	11.40	9.69–13.41

Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; Rate ratios are unadjusted; Ethnicity is level 1 prioritised; Decile is NZDep2013

## Inanimate mechanical force

Between 2008 and 2012 injury from inanimate mechanical force resulted in 14 deaths of 0–14 year olds and 18 deaths of 15–24 year olds (**Table 1**). Injury from exposure to inanimate forces was a major cause of hospitalisation. Over the five years 2010–2014 there were 11,560 hospitalisations of 0–14 year olds and 10,299 of 15–24 year olds for this type of injury (**Table 2, Table 3**).

### Distribution by cause

The main causes were similar for both 0–14 year olds and 15–24 year olds: caught between, foreign body penetrating, struck against or by some object and events involving cutting and piercing (**Table 12**).

Table 12. Hospitalisations for injuries from exposure to an inanimate mechanical force in 0–24 year olds, by age group and cause of injury, New Zealand 2010–2014

Cause of injury: exposure to an inanimate mechanical force	Number: 2010–2014	Number: annual average	Rate per 100,000 population	95% CI	Per cent
New Zealand					
0–14 year olds					
Caught, crushed, jammed or pinched in or between objects	3,955	791	87.32	84.64–90.08	34.2
Foreign body entering into or through eye, natural orifice or skin	2,611	522	57.65	55.48–59.90	22.6
Striking against or struck by sports equipment or other objects*	2,567	513	56.68	54.53–58.91	22.2
Contact with sharp glass, knife, sword or dagger	1,287	257	28.42	26.90–30.01	11.1
Contact with other powered, other and unspecified machinery†	350	70	7.73	6.96–8.58	3.0
Contact with nonpowered hand tool	296	59	6.54	5.83–7.32	2.6
Discharge of firework, handgun or other and unspecified firearms	64	13	1.41	1.11–1.80	0.6
Explosion and rupture of gas cylinder or other materials	19	4	0.42	0.27–0.66	0.2
Exposure to other and unspecified inanimate mechanical forces‡	411	82	9.07	8.24–10.00	3.6
Total	11,560	2,312	255.23	250.63–259.92	100.0
15–24 year olds					
Caught, crushed, jammed or pinched in or between objects	706	141	22.62	21.01–24.35	6.9
Foreign body entering into or through eye, natural orifice or skin	750	150	24.03	22.37–25.81	7.3
Striking against or struck by sports equipment or other objects*	2,713	543	86.93	83.72–90.26	26.3
Contact with sharp glass, knife, sword or dagger	3,608	722	115.61	111.90–119.44	35.0
Contact with other powered, other and unspecified machinery†	1,516	303	48.58	46.19–51.08	14.7
Contact with nonpowered hand tool	334	67	10.70	9.61–11.91	3.2
Discharge of firework, handgun or other and unspecified firearms	148	30	4.74	4.04–5.57	1.4
Explosion and rupture of gas cylinder or other materials	66	13	2.11	1.66–2.69	0.6
Exposure to other and unspecified inanimate mechanical forces‡	458	92	14.68	13.39–16.08	4.4
Total	10,299	2,060	330.00	323.70–336.43	100.0

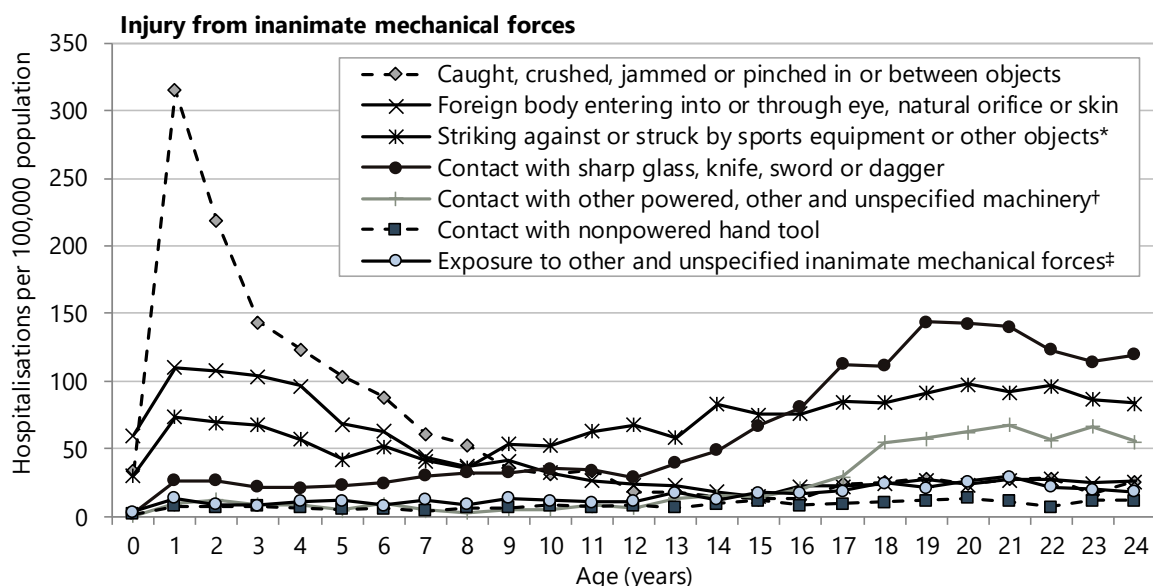
Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; \* Striking against or struck by sports equipment or other objects or thrown, projected or falling object; † includes contact with powered lawnmower, agricultural machinery, other and unspecified machinery, other powered hand tools and household machinery, and lifting and transmission devices, not elsewhere classified; ‡ includes contact with hypodermic needle, exposure to high-pressure jet, and to other and unspecified inanimate mechanical forces

## Distribution by demographic factors

Children around one year of age had a high rate of hospitalisation for caught, jammed, pinched in or between objects. Rates for foreign bodies entering fell from about 4 years of age while rates for sports-related struck by injury rose from age 8 years. Injury from sharp objects increased from age 12 years and peaked around 19–20 years (**Figure 12**).

For injury caused by being caught, crushed, jammed, or pinched in or between objects there was a significant difference associated with NZDep2013 score: hospitalisation rates for 0–14 year olds in areas with higher deprivation scores (NZDep2013 deciles 9–10) were *significantly higher* than rates in deciles 1–2. Among 15–24 year olds hospitalisation rates after contact with sharp glass, knife, sword or dagger were *significantly higher* in NZDep2013 deciles than in areas with the lowest deprivation scores (deciles 1–2). Compared with European/Other hospitalisation rates for ‘caught between’ injuries were *significantly higher* for Māori, Pacific and MELAA 0–14 year olds. Hospitalisation rates for injury from sharp objects were *significantly higher* for Māori and Pacific 15–24 year olds and *significantly lower* for Asian/Indian compared with European/Other and MELAA. Males in both age groups, 0–14 years and 15–24 years, were *significantly more likely* than females to be hospitalised from inanimate mechanical forces (**Table 13**).

Figure 12. Hospitalisations for injuries from inanimate mechanical forces in 0–24 year olds, by age and force type, New Zealand 2010–2014



Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases) \* Striking against or struck by sports equipment or other objects or thrown, projected or falling object; † includes contact with powered lawnmower, agricultural machinery, other and unspecified machinery, other powered hand tools and household machinery, and lifting and transmission devices, not elsewhere classified; ‡ includes discharge of firework, handgun or other and unspecified firearms, explosion and rupture of gas cylinder or other materials, contact with hypodermic needle, exposure to high-pressure jet, and to other and unspecified inanimate mechanical forces

Table 13. Hospitalisations for injuries from exposure to an inanimate mechanical force in 0–24 year olds, by age group and demographic factor, New Zealand 2010–2014

Variable	Number: 2010–2014	Rate per 100,000 population	Rate ratio	95% CI
New Zealand				
Injuries among 0–14 year olds from being caught, crushed, jammed, or pinched in or between objects				
NZ Deprivation Index quintile				
Deciles 1–2	491	56.34	1.00	
Deciles 3–4	468	57.98	1.03	0.91–1.17
Deciles 5–6	565	66.06	1.17	1.04–1.32
Deciles 7–8	768	81.71	1.45	1.30–1.62
Deciles 9–10	1,645	155.91	2.77	2.50–3.06
Prioritised ethnicity				
Māori	1,116	96.85	1.51	1.40–1.63
Pacific	902	207.27	3.24	2.98–3.52
Asian/Indian	323	67.80	1.06	0.94–1.19
MELAA	63	113.19	1.77	1.38–2.28
European/Other	1,542	64.00	1.00	
Gender				
Female	1,787	80.95	1.00	
Male	2,168	93.38	1.15	1.08–1.23
Injuries among 15–24 year olds from contact with sharp glass, knife, sword or dagger				
NZ Deprivation Index quintile				
Deciles 1–2	348	65.51	1.00	
Deciles 3–4	451	86.38	1.32	1.15–1.52
Deciles 5–6	531	91.24	1.39	1.22–1.59
Deciles 7–8	856	125.82	1.92	1.70–2.18
Deciles 9–10	1,390	172.68	2.64	2.34–2.96
Prioritised ethnicity				
Māori	1,237	196.22	2.01	1.87–2.17
Pacific	492	185.24	1.90	1.72–2.10
Asian/Indian	136	29.44	0.30	0.25–0.36
MELAA	40	94.28	0.97	0.71–1.32
European/Other	1,676	97.42	1.00	
Gender				
Female	759	49.47	1.00	
Male	2,849	179.55	3.63	3.35–3.93

Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; Rate ratios are unadjusted; Ethnicity is level 1 prioritised; Decile is NZDep2013

## Animate mechanical force

Between 2008 and 2012 there were fewer than five deaths of 0–14 year olds and of 15–24 year olds as a result of animate mechanical force (**Table 1**). Between 2010 and 2014, there were 2,949 hospitalisations of 0–14 year olds and 3,360 of 15–24 year olds for injuries resulting from animate mechanical forces (**Table 2, Table 3**).

### Distribution by cause

Causes varied by age from these injuries, however, 49.4% of these hospitalisations for 0–14 year olds and 77.1% for 15–24 year olds were from being struck, hit, twisted, by a person or crowd (or stampede). Being bitten or struck by a dog accounted for 29.6% of animate force hospitalisations in 0–14 year olds and 8.6% in 15–24 year olds (**Table 14**).

Table 14. Hospitalisations for injuries from exposure to an animate mechanical force in 0–24 year olds, by age group and cause of injury, New Zealand 2010–2014

Cause of injury: exposure to an animate mechanical force	Number: 2010–2014	Number: annual average	Rate per 100,000 population	95% CI	Per cent
New Zealand					
0–14 year olds					
Struck etc by another person or by crowd or human stampede*	1,456	291	32.15	30.54–33.84	49.4
Bitten or struck by dog	874	175	19.30	18.06–20.62	29.6
Contact with plant or bitten or stung†	434	87	9.58	8.72–10.53	14.7
Contact with, bitten or struck by marine animal, rat or other mammals	174	35	3.84	3.31–4.46	5.9
Exposure to other and unspecified animate mechanical forces‡	11	2	0.24	0.14–0.43	0.4
Total	2,949	590	65.11	62.80–67.50	100.0
15–24 year olds					
Struck etc by another person or by crowd or human stampede*	2,592	518	83.05	79.92–86.31	77.1
Bitten or struck by dog	289	58	9.26	8.25–10.39	8.6
Contact with plant or bitten or stung†	185	37	5.93	5.13–6.85	5.5
Contact with, bitten or struck by marine animal, rat or other mammals	280	56	8.97	7.98–10.09	8.3
Exposure to other and unspecified animate mechanical forces‡	14	3	0.45	0.27–0.75	0.4
Total	3,360	672	107.66	104.08–111.36	100.0

Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; \* Hit, struck, kicked, twisted, bitten, scratched, striking against or bumped into by another person or crushed, pushed or stepped on by crowd or human stampede; † Contact with plant thorns and spines and sharp leaves or bitten or stung by nonvenomous insect and other nonvenomous arthropods; ‡ Exposure to other and unspecified animate mechanical forces also includes being bitten or struck by other animals

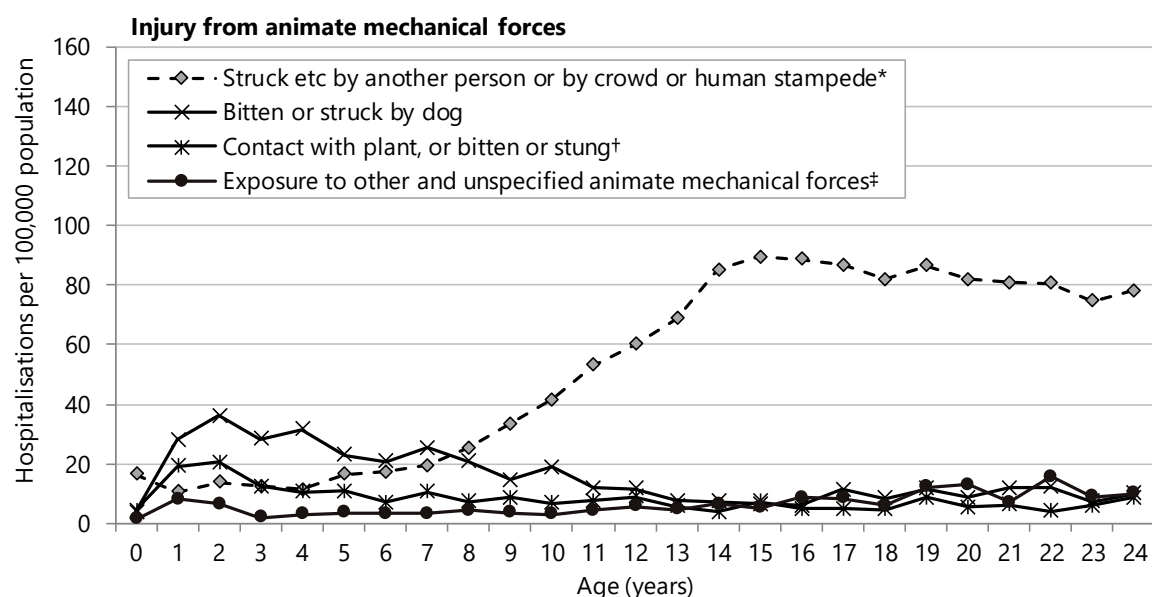
### Distribution by demographic factors

Patterns of animate force injury requiring hospitalisation varied by age. Hospitalisation rates after being hit, struck, kicked, twisted, bitten, scratched, striking against or bumped into by another person or crushed, pushed or stepped on by crowd or human stampede rose with increasing age from age 8 years to a plateau from around 14–24 years. Dog-related injury hospitalisations were highest at age 2 years and then fell with increasing age until a plateau from around age 13. Plant- and insect-related injuries were also most common in 2–3 year olds and then tended to decline with increasing age (**Figure 13**).

For all ages, those living in areas with the highest deprivation scores (NZDep2013 deciles 9–10) had a *significantly higher* chance of being struck by another person or a crowd compared with deciles 1–6. Compared with European/Other, hospitalisation rates for this type of injury were *significantly higher* for Pacific 0–24 year olds and Māori 15–24 year olds. Males had a *significantly higher* rate than females of being struck by and this was most marked in the 15–24 year age group (**Table 15, Table 16**).



Figure 13. Hospitalisations for injuries from animate mechanical forces in 0–24 year olds, by age and force type, New Zealand 2010–2014



Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; \* Hit, struck, kicked, twisted, bitten, scratched, striking against or bumped into by another person or crushed, pushed or stepped on by crowd or human stampede; † Contact with plant thorns and spines and sharp leaves or bitten or stung by nonvenomous insect and other nonvenomous arthropods; ‡ Exposure to other and unspecified animate mechanical forces also includes being bitten or struck by other animals

Table 15. Hospitalisations for injuries from exposure to an animate mechanical force in 0–14 year olds, by age group and demographic factor, New Zealand 2010–2014

Variable	Number: 2010–2014	Rate per 100,000 population	Rate ratio	95% CI
Injuries from animate mechanical forces: struck etc by another person or by crowd or human stampede*				
0–14 year olds				
NZ Deprivation Index quintile				
Deciles 1–2	252	28.92	1.00	
Deciles 3–4	237	29.36	1.02	0.85–1.21
Deciles 5–6	223	26.07	0.90	0.75–1.08
Deciles 7–8	295	31.39	1.09	0.92–1.28
Deciles 9–10	444	42.08	1.46	1.25–1.70
Prioritised ethnicity				
Māori	384	33.32	1.00	0.89–1.13
Pacific	189	43.43	1.30	1.11–1.53
Asian/Indian	56	11.76	0.35	0.27–0.46
MELAA	19	34.14	1.03	0.65–1.62
European/Other	802	33.29	1.00	
Gender				
Female	381	17.26	1.00	
Male	1,075	46.30	2.68	2.39–3.02

Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; \* Hit, struck, kicked, twisted, bitten, scratched, striking against or bumped into by another person or crushed, pushed or stepped on by crowd or human stampede; Rate ratios are unadjusted; Ethnicity is level 1 prioritised; Decile is NZDep2013

Table 16. Hospitalisations for injuries from exposure to an animate mechanical force in 15–24 year olds, by age group and demographic factor, New Zealand 2010–2014

Variable	Number: 2010–2014	Rate per 100,000 population	Rate ratio	95% CI
Injuries from animate mechanical forces: struck etc by another person or by crowd or human stampede*				
15–24 year olds				
NZ Deprivation Index quintile				
Deciles 1–2	384	72.28	1.00	
Deciles 3–4	337	64.54	0.89	0.77–1.03
Deciles 5–6	424	72.85	1.01	0.88–1.16
Deciles 7–8	563	82.75	1.14	1.01–1.30
Deciles 9–10	858	106.59	1.47	1.31–1.66
Prioritised ethnicity				
Māori	681	108.02	1.49	1.36–1.63
Pacific	505	190.14	2.62	2.36–2.90
Asian/Indian	96	20.78	0.29	0.23–0.35
MELAA	38	89.56	1.23	0.89–1.70
European/Other	1,249	72.60	1.00	
Gender				
Female	325	21.18	1.00	
Male	2,267	142.87	6.74	6.00–7.58

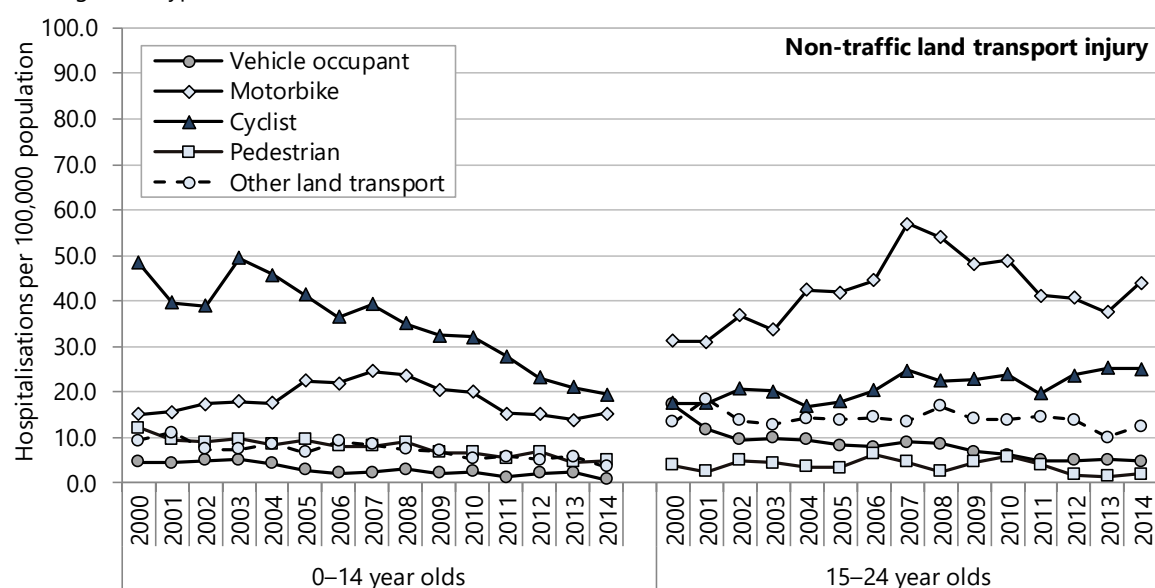
Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; \* Hit, struck, kicked, twisted, bitten, scratched, striking against or bumped into by another person or crushed, pushed or stepped on by crowd or human stampede; Rate ratios are unadjusted; Ethnicity is level 1 prioritised; Decile is NZDep2013

## Non-traffic transport injury

Between 2008 and 2012 there were 40 deaths as a result of injuries from non-traffic transport (i.e. events occurring off road) among children aged 0–14 years and 31 deaths among 15–24 year olds. The deceased was most commonly a pedestrian among 0–14 year olds (24 deaths) and a vehicle occupant among 15–24 year olds (12 deaths) (**Table 1**).

The hospitalisation rate for non-traffic injuries fell from 2004 to 2014 for the 0–14 year olds and this was mainly driven by a fall in cyclist hospitalisations. Among 15–24 year olds the hospitalisation rate rose from 2004 to 2007 and then declined overall; this pattern was influenced mainly by changes in motorbike-related injury hospitalisations. A similar rise and fall in motorbike-related injury hospitalisation over time was seen in 0–14 year olds although with lower rates overall and a flatter peak (**Figure 14**).

Figure 14. Hospitalisations from non-traffic land transport injuries in 0–24 year olds, by age group, year of discharge, and type, New Zealand 2000–2014



Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population

## Distribution by cause

Between 2010 and 2014 injuries arising from non-traffic transport resulted in 2,393 hospitalisations among 0–14 year olds and 2,710 hospitalisations among those aged 15–24 years. Hospitalisations for non-traffic transport injury among 0–14 year olds were more commonly for cycling (46.6%) followed by motorbike (29.9%) and for 15–24 year olds most common was motorbike injuries (48.9%) and cycling (27.0%) (**Table 17**).

Table 17. Hospitalisations from unintentional non-traffic crash injuries in 0–24 year olds, by age group, New Zealand 2010–2014

Cause of injury: non-traffic land transport	Number: 2010–2014	Number: annual average	Rate per 100,000 population	95% CI	Per cent
New Zealand					
0–14 year olds					
Vehicle occupant	78	16	1.72	1.38–2.15	3.3
Motorbike	716	143	15.81	14.69–17.01	29.9
Cyclist	1,116	223	24.64	23.24–26.13	46.6
Pedestrian	256	51	5.65	5.00–6.39	10.7
Other land transport	227	45	5.01	4.40–5.71	9.5
Total	2,393	479	52.83	50.76–54.99	100.0
15–24 year olds					
Vehicle occupant	160	32	5.13	4.39–5.99	5.9
Motorbike	1,324	265	42.42	40.20–44.77	48.9
Cyclist	733	147	23.49	21.85–25.25	27.0
Pedestrian	92	18	2.95	2.40–3.61	3.4
Other land transport	401	80	12.85	11.65–14.17	14.8
Total	2,710	542	86.83	83.63–90.16	100.0

Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population

## Distribution by demographic factors

Between 2010 and 2014 hospitalisation rates of 0–24 year olds for vehicle occupant non-traffic injuries were *significantly higher* in areas with the highest NZDep2013 scores (NZDep2013 deciles 9–10) compared with deciles 1–2. Asian/Indian ethnic groups had *significantly lower* rates than European/Other, and 0–4 and 5–14 year olds had *significantly lower* rates than 15–24 year olds (**Table 18**).

There was no clear social gradient in hospitalisation rates for non-traffic motorbike or cycle injuries with the highest rates in areas with NZDep2013 decile 3–4 scores (*significantly higher* than deciles 1–2) and the lowest rates in areas with the highest deprivation index scores (*significantly lower* than deciles 1–2) (**Table 19**). For both these type of injury Māori, Pacific and Asian/Indian had *significantly lower* rates than European/Other. Compared with 15–24 year olds non-traffic motorbike hospitalisation rates were *significantly lower* for 0–4 and 5–14 year olds, whereas for non-traffic cycle injury hospitalisation rates were *significantly lower* for 0–4 year olds and *significantly higher* for 5–14 year olds (**Table 19**).

Hospitalisation rates for pedestrian injuries were *significantly higher* in areas with higher deprivation index scores (NZDep2013 deciles 7–10) compared with deciles 1–2. Māori rates were *significantly higher* than European/Other, and rates for 0–4 and 5–14 year olds were *significantly higher* than for 15–24 year olds (**Table 20**).

Male hospitalisation rates were *significantly higher* than female for all specific types of non-traffic injury and this difference was particularly marked for motorbike injury (**Table 19**, **Table 20**).

Table 18. Hospitalisations for vehicle occupant-related non-traffic land transport injuries in 0–24 year olds, by demographic factor, New Zealand 2010–2014

Variable	Number: 2010–2014	Rate per 100,000 population	Rate ratio	95% CI
Non-traffic land transport injuries: vehicle occupant				
0–24 year olds				
NZ Deprivation Index quintile				
Deciles 1–2	34	2.42	1.00	
Deciles 3–4	38	2.86	1.18	0.74–1.87
Deciles 5–6	42	2.92	1.21	0.77–1.89
Deciles 7–8	47	2.90	1.20	0.77–1.86
Deciles 9–10	70	3.76	1.55	1.03–2.34
Prioritised ethnicity				
Māori	62	3.48	0.98	0.73–1.31
Pacific	20	2.85	0.80	0.50–1.28
Asian/Indian	5	0.53	0.15	0.06–0.37
MELAA	<5	s	s	s
European/Other	147	3.56	1.00	
Gender				
Female	75	2.00	1.00	
Male	163	4.17	2.08	1.58–2.73
Age group (years)				
0–4	33	2.14	0.42	0.29–0.61
5–14	45	1.51	0.29	0.21–0.41
15–24	160	5.13	1.00	

Numerator: National Minimum Dataset, Denominator: Statistics NZ Estimated Resident Population; Rate ratios are unadjusted; Ethnicity is level 1 prioritised; Decile is NZDep2013

Table 19. Hospitalisations for motorbike-related and cyclist-related non-traffic land transport injuries in 0–24 year olds, by demographic factor, New Zealand 2010–2014

Variable	Number: 2010–2014	Rate per 100,000 population	Rate ratio	95% CI
0–24 year olds				
Non-traffic land transport injuries: motorbike				
NZ Deprivation Index quintile				
Deciles 1–2	352	25.09	1.00	
Deciles 3–4	443	33.33	1.33	1.15–1.53
Deciles 5–6	450	31.31	1.25	1.09–1.43
Deciles 7–8	409	25.24	1.01	0.87–1.16
Deciles 9–10	368	19.78	0.79	0.68–0.91
Prioritised ethnicity				
Māori	272	15.26	0.37	0.32–0.42
Pacific	18	2.57	0.06	0.04–0.10
Asian/Indian	11	1.17	0.03	0.02–0.05
MELAA	<5	s	s	s
European/Other	1,717	41.58	1.00	
Gender				
Female	182	4.86	1.00	
Male	1,858	47.54	9.77	8.39–11.38
Age group (years)				
0–4	24	1.56	0.04	0.02–0.05
5–14	692	23.16	0.55	0.50–0.60
15–24	1,324	42.42	1.00	
Non-traffic land transport injuries: cyclist				
NZ Deprivation Index quintile				
Deciles 1–2	310	22.10	1.00	
Deciles 3–4	356	26.78	1.21	1.04–1.41
Deciles 5–6	345	24.00	1.09	0.93–1.27
Deciles 7–8	363	22.40	1.01	0.87–1.18
Deciles 9–10	440	23.66	1.07	0.93–1.24
Prioritised ethnicity				
Māori	405	22.72	0.74	0.66–0.83
Pacific	97	13.84	0.45	0.37–0.56
Asian/Indian	42	4.48	0.15	0.11–0.20
MELAA	24	24.47	0.80	0.53–1.20
European/Other	1,263	30.58	1.00	
Gender				
Female	342	9.14	1.00	
Male	1,507	38.56	4.22	3.75–4.74
Age group (years)				
0–4	209	13.56	0.58	0.50–0.67
5–14	907	30.35	1.29	1.17–1.42
15–24	733	23.49	1.00	

Numerator: National Minimum Dataset, Denominator: Statistics NZ Estimated Resident Population; Rate ratios are unadjusted; Ethnicity is level 1 prioritised; Decile is NZDep2013

Table 20. Hospitalisations for pedestrian-related non-traffic land transport injuries in 0–24 year olds, by demographic factor, New Zealand 2010–2014

Variable	Number: 2010–2014	Rate per 100,000 population	Rate ratio	95% CI
Non-traffic land transport injuries: pedestrian				
0–24 year olds				
NZ Deprivation Index quintile				
Deciles 1–2	38	2.71	1.00	
Deciles 3–4	46	3.46	1.28	0.83–1.96
Deciles 5–6	46	3.20	1.18	0.77–1.82
Deciles 7–8	78	4.81	1.78	1.21–2.62
Deciles 9–10	132	7.10	2.62	1.83–3.76
Prioritised ethnicity				
Māori	126	7.07	1.90	1.50–2.40
Pacific	37	5.28	1.42	0.99–2.03
Asian/Indian	27	2.88	0.77	0.51–1.16
MELAA	<5	s	s	s
European/Other	154	3.73	1.00	
Gender				
Female	133	3.55	1.00	
Male	215	5.50	1.55	1.25–1.92
Age group (years)				
0–4	137	8.89	3.02	2.32–3.93
5–14	119	3.98	1.35	1.03–1.77
15–24	92	2.95	1.00	

Numerator: National Minimum Dataset, Denominator: Statistics NZ Estimated Resident Population; Rate ratios are unadjusted; Ethnicity is level 1 prioritised; Decile is NZDep2013

## Thermal injury

Between 2008 and 2012 there were 11 deaths of 0–14 year olds and 10 deaths of 15–24 year olds as a result of thermal injury (**Table 1**). Between 2010 and 2014 thermal injury resulted in 1,965 hospitalisations for 0–14 year olds and 759 hospitalisations of 15–24 year olds (**Table 2**, **Table 3**).

### Distribution by cause

Over half the hospitalisations of 0–14 year olds (57.4%) were the result of contact with hot drinks, food, fats and other hot fluids. For 15–24 year olds the most common causes of thermal injury were exposure to smoke, flame and fire, and contact with hot drinks, foods; combined these two causes comprised 56.8% of all hospitalisations for the older age group (**Table 21**).

Table 21. Hospitalisations for thermal injuries in 0–24 year olds, by age group and cause of injury, New Zealand 2010–2014

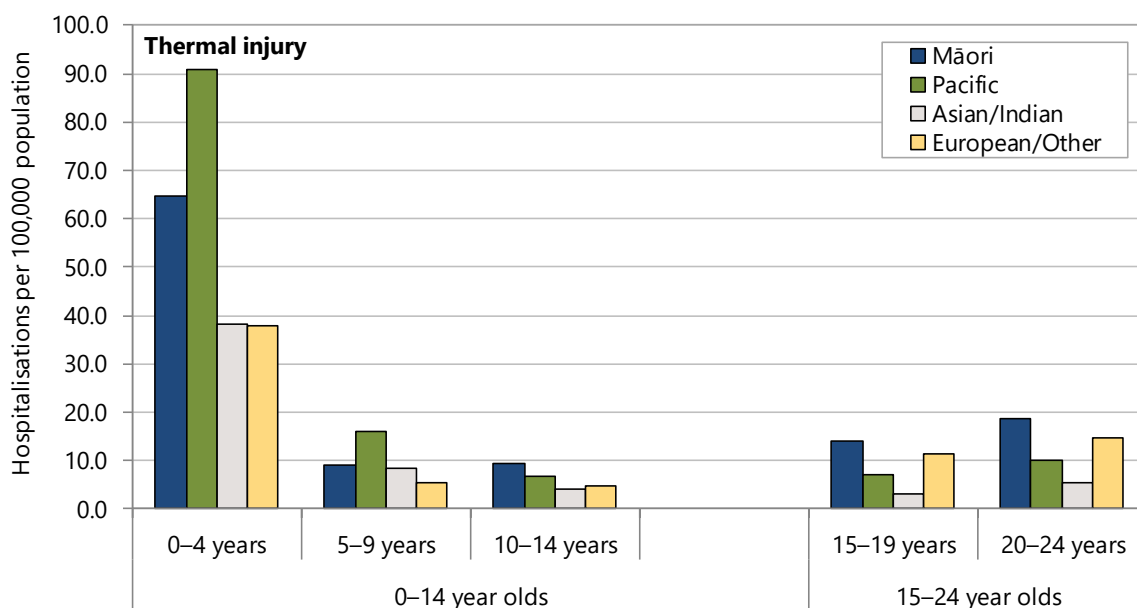
Cause of injury: thermal injury	Number: 2010–2014	Number: annual average	Rate per 100,000 population	95% CI	Per cent
New Zealand					
0–14 year olds					
Contact with hot drinks, food, fats, cooking oils, other hot fluids	1,128	226	24.90	23.49–26.40	57.4
Contact with hot household appliances, hot heating appliances, radiators and pipes	260	52	5.74	5.08–6.48	13.2
Contact with hot tap-water	204	41	4.50	3.93–5.17	10.4
Exposure to smoke, fire and flames	182	36	4.02	3.48–4.65	9.3
Contact with hot substances, other hot metals, other and unspecified heat	61	12	1.35	1.05–1.73	3.1
Exposure to ignition of highly flammable material	44	9	0.97	0.72–1.30	2.2
Contact with hot engines, machinery and tools	28	6	0.62	0.43–0.89	1.4
Exposure to electric current	28	6	0.62	0.43–0.89	1.4
Exposure to ignition or melting clothing or nightwear	26	5	0.57	0.39–0.84	1.3
Other thermal injury	<5	s	s	s	s
Total	1,965	393	43.38	41.51–45.35	100.0
15–24 year olds					
Exposure to smoke, fire and flames	222	44	7.11	6.24–8.11	29.2
Contact with hot drinks, food, fats, cooking oils, other hot fluids	209	42	6.70	5.85–7.67	27.5
Exposure to ignition of highly flammable material	125	25	4.01	3.36–4.77	16.5
Contact with hot substances, other hot metals, other and unspecified heat	53	11	1.70	1.30–2.22	7.0
Exposure to electric current	50	10	1.60	1.22–2.11	6.6
Contact with hot household appliances, hot heating appliances, radiators and pipes	32	6	1.03	0.73–1.45	4.2
Contact with hot engines, machinery and tools	22	4	0.70	0.47–1.07	2.9
Contact with hot tap-water	19	4	0.61	0.39–0.95	2.5
Exposure to ignition or melting clothing or nightwear	18	4	0.58	0.36–0.91	2.4
Other thermal injury	9	2	0.29	0.15–0.55	1.2
Total	759	152	24.32	22.65–26.11	100.0

Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population

## Distribution by demographic factors

For 0–14 year olds there is a differential for thermal injury hospitalisation with rates for areas with NZDep2013 decile 3–10 scores being *significantly higher* than those in deciles 1–2. Among 15–24 year olds rates were *significantly higher* for NZDep2013 deciles 7–10. Compared with European/Other thermal injury hospitalisation rates were *significantly higher* for Māori 0–24 year olds, Pacific, Asian/Indian and MELAA 0–14 year olds, and *significantly lower* for Pacific and Asian/Indian 15–24 year olds. Males had a *significantly higher* rate than females (**Table 22, Table 23**). Children aged under 5 years had much higher rates of hospitalisation than any other age group (**Figure 15**).

Figure 15. Hospitalisations for thermal injuries in 0–24 year olds, by age group and ethnicity, New Zealand 2010–2014



Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; Ethnicity is level 1 prioritised

Table 22. Hospitalisations for thermal injuries in 0–14 year olds, by demographic factor, New Zealand 2010–2014

Variable	Number: 2010–2014	Rate per 100,000 population	Rate ratio	95% CI
Thermal injuries				
0–14 year olds				
NZ Deprivation Index quintile				
Deciles 1–2	175	20.08	1.00	
Deciles 3–4	210	26.02	1.30	1.06–1.58
Deciles 5–6	266	31.10	1.55	1.28–1.87
Deciles 7–8	439	46.71	2.33	1.95–2.77
Deciles 9–10	861	81.61	4.06	3.45–4.78
Prioritised ethnicity				
Māori	670	58.14	1.92	1.73–2.13
Pacific	340	78.13	2.58	2.26–2.93
Asian/Indian	172	36.11	1.19	1.01–1.41
MELAA	45	80.85	2.66	1.97–3.60
European/Other	731	30.34	1.00	
Gender				
Female	799	36.20	1.00	
Male	1,166	50.22	1.39	1.27–1.52

Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; Rate ratios are unadjusted; Ethnicity is level 1 prioritised; Decile is NZDep2013



Table 23. Hospitalisations for thermal injuries in 15–24 year olds, by demographic factor, New Zealand 2010–2014

Variable	Number: 2010–2014	Rate per 100,000 population	Rate ratio	95% CI
Thermal injuries				
15–24 year olds				
NZ Deprivation Index quintile				
Deciles 1–2	92	17.32	1.00	
Deciles 3–4	105	20.11	1.16	0.88–1.54
Deciles 5–6	128	21.99	1.27	0.97–1.66
Deciles 7–8	179	26.31	1.52	1.18–1.95
Deciles 9–10	240	29.82	1.72	1.35–2.19
Prioritised ethnicity				
Māori	205	32.52	1.23	1.04–1.45
Pacific	45	16.94	0.64	0.47–0.87
Asian/Indian	41	8.88	0.34	0.24–0.46
MELAA	<5	s	s	s
European/Other	454	26.39	1.00	
Gender				
Female	208	13.56	1.00	
Male	551	34.73	2.56	2.18–3.00

Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; Rate ratios are unadjusted; Ethnicity is level 1 prioritised; Decile is NZDep2013

## Poisoning

Between 2008 and 2012 there were nine deaths of 0–14 year olds and 53 deaths of 15–24 year olds as a result of unintentional poisoning (**Table 1**). Between 2010 and 2014 there were 1,792 hospitalisations of 0–14 year olds and 504 of 15–24 year olds for poisoning (**Table 2, Table 3**).

### Distribution by cause

The most common causes of poisoning for both 0–14 year olds and 15–24 year olds were the two groupings: firstly, antiepileptic, sedative-hypnotic, anti-parkinsonism and psychotropic drugs, not elsewhere classified, and secondly, non-opioid analgesics, antipyretics and anti-rheumatics (**Table 24**).

Table 24. Hospitalisations for poisoning in 0–24 year olds, by age group and type of poisoning, New Zealand 2010–2014

Cause of injury: poisoning	Number: 2010–2014	Number: annual average	Rate per 100,000 population	95% CI	Per cent
New Zealand					
0–14 year olds					
Antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, NEC	340	68	7.51	6.75–8.35	19.0
Non-opioid analgesics, antipyretics and antirheumatics	333	67	7.35	6.60–8.19	18.6
Narcotics and psychodysleptics (hallucinogens), NEC	162	32	3.58	3.07–4.17	9.0
Other and unspecified drugs, medicaments and biological substances	422	84	9.32	8.47–10.25	23.5
Other drugs acting on the autonomic nervous system	80	16	1.77	1.42–2.20	4.5
Organic solvents and halogenated hydrocarbons and their vapours	71	14	1.57	1.24–1.98	4.0
Pesticides	40	8	0.88	0.65–1.20	2.2
Alcohol	34	7	0.75	0.54–1.05	1.9
Other gases and vapours	20	4	0.44	0.29–0.68	1.1
Other and unspecified chemicals and noxious substances	290	58	6.40	5.71–7.18	16.2
Total	1,792	358	39.57	37.78–41.44	100.0
15–24 year olds					
Antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, NEC	120	24	3.85	3.22–4.60	23.8
Non-opioid analgesics, antipyretics and antirheumatics	117	23	3.75	3.13–4.49	23.2
Narcotics and psychodysleptics (hallucinogens), NEC	52	10	1.67	1.27–2.18	10.3
Other and unspecified drugs, medicaments and biological substances	44	9	1.41	1.05–1.89	8.7
Other drugs acting on the autonomic nervous system	<5	s	s	s	s
Alcohol	39	8	1.25	0.91–1.71	7.7
Other gases and vapours	19	4	0.61	0.39–0.95	3.8
Pesticides	6	1	0.19	0.09–0.42	1.2
Organic solvents and halogenated hydrocarbons and their vapours	<5	s	s	s	s
Other and unspecified chemicals and noxious substances	102	20	3.27	2.69–3.97	20.2
Total	504	101	16.15	14.80–17.62	100.0

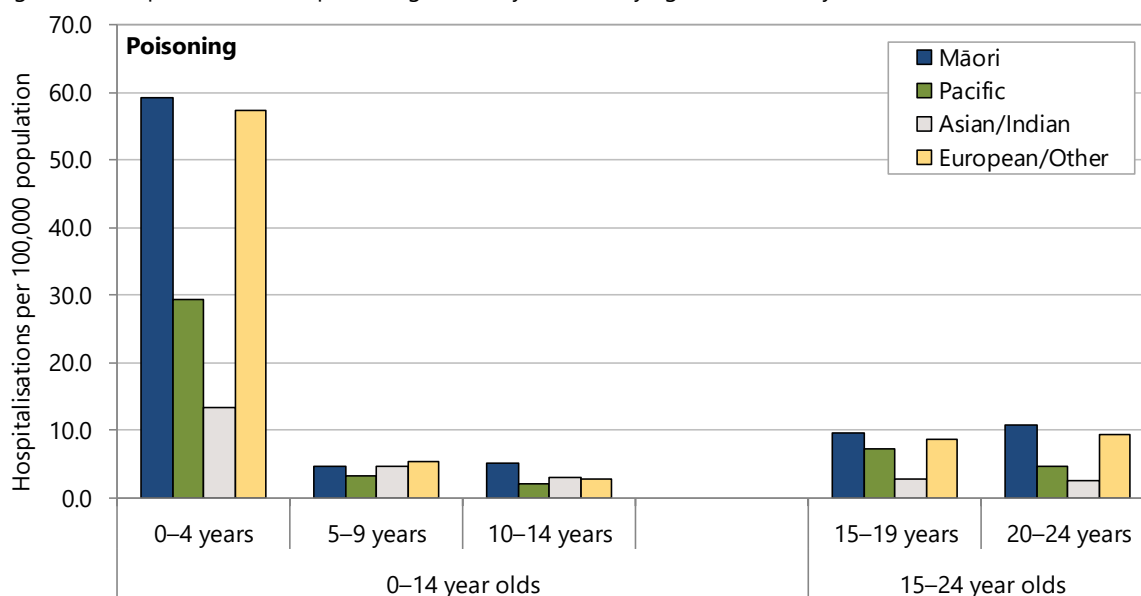
Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population

## Distribution by demographic factors

The 0–14 year olds living in areas with higher deprivation index scores (NZDep2013 deciles 5–10) had *significantly higher* rates for poisoning than those living in low deprivation areas (deciles 1–2). Rates for Māori were *significantly higher*, and for Pacific and Asian/Indian *significantly lower*, than European/Other for those aged 0–14 years. There was *no significant* difference between males and females aged 0–14 years (**Table 25**).

Among 15–24 year olds, those in NZDep2013 deciles 7–10 had *significantly higher* rates, and Pacific and Asian/Indian had *significantly lower* rates than European/Other. There was *no significant* difference between males and females among 15–24 year olds (**Table 26**). Rates for hospitalisations for unintentional poisoning were highest for Māori and European/Other aged 0–4 year olds (**Figure 16**).

Figure 16. Hospitalisations for poisoning in 0–24 year olds, by age and ethnicity, New Zealand 2010–2014



Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; Rate ratios are unadjusted; Ethnicity is level 1 prioritised

Table 25. Hospitalisations for poisoning in 0–14 year olds, by demographic factor, New Zealand 2010–2014

Variable	Number: 2010–2014	Rate per 100,000 population	Rate ratio	95% CI
Poisoning				
0–14 year olds				
NZ Deprivation Index quintile				
Deciles 1–2	227	26.05	1.00	
Deciles 3–4	249	30.85	1.18	0.99–1.42
Deciles 5–6	329	38.47	1.48	1.25–1.75
Deciles 7–8	454	48.30	1.85	1.58–2.17
Deciles 9–10	527	49.95	1.92	1.64–2.24
Prioritised ethnicity				
Māori	559	48.51	1.13	1.02–1.26
Pacific	104	23.90	0.56	0.46–0.68
Asian/Indian	70	14.69	0.34	0.27–0.44
MELAA	25	44.92	1.05	0.71–1.56
European/Other	1,032	42.83	1.00	
Gender				
Female	831	37.65	1.00	
Male	961	41.39	1.10	1.00–1.21

Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; Rate ratios are unadjusted; Ethnicity is level 1 prioritised; Decile is NZDep2013

Table 26. Hospitalisations for poisoning in 15–24 year olds, by demographic factor, New Zealand 2010–2014

Variable	Number: 2010–2014	Rate per 100,000 population	Rate ratio	95% CI
Poisoning				
15–24 year olds				
NZ Deprivation Index quintile				
Deciles 1–2	63	11.86	1.00	
Deciles 3–4	70	13.41	1.13	0.80–1.59
Deciles 5–6	81	13.92	1.17	0.84–1.63
Deciles 7–8	147	21.61	1.82	1.36–2.45
Deciles 9–10	137	17.02	1.44	1.06–1.93
Prioritised ethnicity				
Māori	127	20.15	1.12	0.91–1.38
Pacific	32	12.05	0.67	0.47–0.97
Asian/Indian	25	5.41	0.30	0.20–0.45
MELAA	8	18.86	1.05	0.52–2.12
European/Other	309	17.96	1.00	
Gender				
Female	244	15.90	1.00	
Male	260	16.39	1.03	0.87–1.23

Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; Rate ratios are unadjusted; Ethnicity is level 1 prioritised; Decile is NZDep2013

## South Island region distribution and trends

### Comparison with New Zealand

From 2008 to 2012 deaths due to unintentional injury for 0–24 year olds were *significantly higher* than the national rate in South Canterbury and the West Coast DHBs. Rates were not significantly different in Nelson Marlborough, Canterbury or Southern DHBs (**Table 27**). Rates were *significantly lower* than the national rate for 0–14 year olds in Southern DHB and *significantly higher* than the national rate for 15–24 year olds in Nelson Marlborough, South Canterbury and on the West Coast (**Table 28**).

Table 27. Deaths due to unintentional injuries in 0–24 year olds, South Island DHBs vs New Zealand 2008–2012

DHB	Number: 2008–2012	Number: annual average	Rate per 100,000 population	Rate ratio	95% CI
Unintentional injury deaths					
0–24 year olds					
Nelson Marlborough	33	7	15.79	1.05	0.74–1.48
South Canterbury	21	4	24.82	1.64	1.07–2.53
Canterbury	123	25	14.91	0.99	0.82–1.19
West Coast	23	5	45.99	3.05	2.02–4.60
Southern	71	14	13.80	0.91	0.72–1.16
New Zealand	1,146	229	15.10	1.00	

Numerator: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population

Table 28. Deaths due to unintentional injuries, by age group, South Island DHBs vs New Zealand 2008–2012

DHB	Number: 2008–2012	Number: annual average	Rate per 100,000 population	Rate ratio	95% CI
Unintentional injury deaths					
0–14 year olds					
Nelson Marlborough	5	1	3.75	0.45	0.19–1.09
South Canterbury	3	1	5.67	0.68	0.22–2.13
Canterbury	35	7	7.42	0.89	0.63–1.27
West Coast	5	1	15.68	1.89	0.78–4.57
Southern	11	2	3.96	0.48	0.26–0.87
New Zealand	373	75	8.29	1.00	
15–24 year olds					
Nelson Marlborough	28	6	36.93	1.48	1.01–2.15
South Canterbury	18	4	56.86	2.27	1.42–3.62
Canterbury	88	18	24.93	1.00	0.80–1.24
West Coast	18	4	99.33	3.97	2.49–6.33
Southern	60	12	25.38	1.01	0.78–1.32
New Zealand	773	155	25.03	1.00	

Numerator: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population; Rates per 100,000 age specific population

From 2010 to 2014 injury hospitalisation rates for 0–24 year olds were *significantly higher* in South Canterbury and the West Coast DHBs than the overall national rate, and *significantly lower* in the Southern DHB. Rates in Nelson Marlborough and Canterbury DHBs were *not significant different* from the national rate (**Table 29**).

Table 29. Hospitalisations for unintentional injuries, by age group, South Island DHBs vs New Zealand 2010–2014

DHB	Number: 2010–2014	Number: annual average	Rate per 100,000 population	Rate ratio	95% CI
Unintentional injury hospitalisations					
0–24 year olds					
Nelson Marlborough	2,374	475	1,132.32	0.99	0.95–1.03
South Canterbury	1,056	211	1,239.44	1.08	1.02–1.15
Canterbury	9,463	1,893	1,142.45	1.00	0.97–1.02
West Coast	763	153	1,529.93	1.33	1.24–1.43
Southern	5,228	1,046	1,012.13	0.88	0.86–0.91
New Zealand	87,822	17,564	1,147.98	1.00	
0–14 year olds					
Nelson Marlborough	1,263	253	940.53	0.87	0.82–0.92
South Canterbury	542	108	1,024.30	0.94	0.87–1.03
Canterbury	5,416	1,083	1,144.01	1.06	1.03–1.09
West Coast	384	77	1,216.56	1.12	1.02–1.24
Southern	2,462	492	878.73	0.81	0.78–0.84
New Zealand	49,103	9,821	1,084.13	1.00	
15–24 year olds					
Nelson Marlborough	1,111	222	1,474.03	1.19	1.12–1.26
South Canterbury	514	103	1,592.04	1.28	1.18–1.40
Canterbury	4,047	809	1,140.37	0.92	0.89–0.95
West Coast	379	76	2,070.23	1.67	1.51–1.84
Southern	2,766	553	1,170.26	0.94	0.91–0.98
New Zealand	38,719	7,744	1,240.64	1.00	

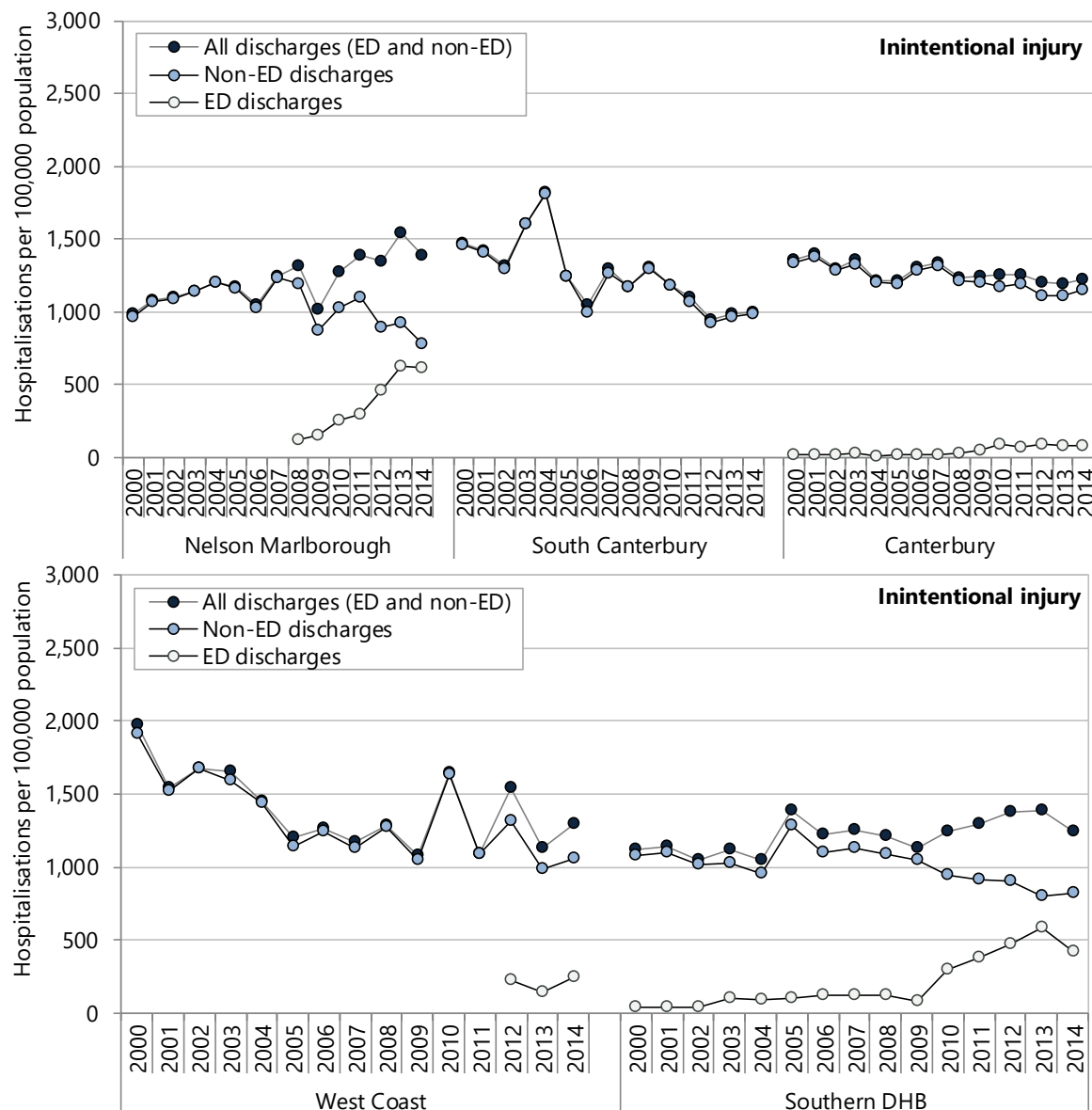
Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; Rates per 100,000 age specific population

## Regional trends

From 2000 to 2014 the hospitalisation rate (excluding emergency department (ED) discharges) for unintentional injury among 0–14 year olds declined in all South Island DHBs, with it being more obvious in Nelson Marlborough, South Canterbury, West Coast and Southern DHBs (**Figure 17**).

Injury hospitalisation rates for 0–14 year olds declined slightly for falls, except on the West Coast where there was a steeper decline. Hospitalisations for most other injury causes stayed relatively stable during 2000–2014 for 0–14 year olds. For 15–24 year olds, the South Island DHBs showed a decline in hospitalisation rates for road traffic injuries while rates for other causes varied within a narrow range (**Figure 18**).

Figure 17. Hospitalisations from injuries in 0–14 year olds, by year of discharge and discharge type, South Island DHBs



Numerator: National Minimum Dataset (acute and arranged admissions); Denominator: Statistics NZ Estimated Resident Population; See Error! Reference source not found. for definitions for hospitalisation and discharge; ED cases are those with a health speciality code on discharge of M05–M08; ED rates suppressed where reporting was not consistent prior to 2009

## Distribution by cause

In the South Island DHBs between 2008 and 2012, the leading cause of death was suffocation among 0–14 year olds in Canterbury DHB and RTIs among 15–24 year olds in each of the DHBs (**Table 30–Table 32**).

Table 30. Unintentional injury deaths in 0–24 year olds, by age group and cause, Nelson Marlborough and South Canterbury DHBs 2008–2012

Deaths by cause of unintentional injury	Number: 2008–2012	Number: annual average	Rate per 100,000 population	95% CI	Per cent
Nelson Marlborough					
0–14 year olds					
Inanimate mechanical forces	<3	s	s	s	s
Road traffic	<3	s	s	s	s
Non-traffic transport accidents	<3	s	s	s	s
Suffocation	<3	s	s	s	s
Drowning or submersion	<3	s	s	s	s
Total	5	1	2.25	0.77–6.62	100.0
15–24 year olds					
Road traffic	20	4	26.38	17.1–40.8	71.4
Poisoning	<3	s	s	s	s
Drowning or submersion	<3	s	s	s	s
Suffocation	<3	s	s	s	s
Other transport	<3	s	s	s	s
Thermal	<3	s	s	s	s
Total	28	6	10.55	5.35–20.8	100.0
South Canterbury					
0–14 year olds					
Road traffic	<3	s	s	s	s
Non-traffic transport accidents	<3	s	s	s	s
Suffocation	<3	s	s	s	s
Total	3	1	1.89	0.33–10.7	100.0
15–24 year olds					
Road traffic	13	3	41.06	24–70.25	72.2
Drowning or submersion	<3	s	s	s	s
Falls	<3	s	s	s	s
Non-traffic transport accidents	<3	s	s	s	s
Suffocation	<3	s	s	s	s
Total	18	4	12.64	4.91–32.49	100.0

Numerator: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population

Table 31. Deaths due to unintentional injuries in 0–24 year olds, by age group and cause of injury, Canterbury and West Coast DHBs 2008–2012

Deaths by cause of unintentional injury	Number: 2008–2012	Number: annual average	Rate per 100,000 population	95% CI	Per cent
Canterbury					
0–14 year olds					
Suffocation	11	2	2.33	1.30–4.17	31.4
Road traffic	7	1	1.48	0.72–3.06	20.0
Drowning or submersion	5	1	1.06	0.45–2.48	14.3
Thermal	3	1	0.64	0.22–1.87	8.6
Inanimate mechanical forces	<3	s	s	s	s
Non-traffic transport accidents	<3	s	s	s	s
Poisoning	<3	s	s	s	s
Other causes	5	1	1.06	0.45–2.48	14.3
Total	35	7	7.42	5.33–10.31	100.0
15–24 year olds					
Road traffic	42	8	11.90	8.80–16.08	47.7
Poisoning	9	2	2.55	1.34–4.85	10.2
Drowning or submersion	8	2	2.27	1.15–4.47	9.1
Falls	5	1	1.42	0.60–3.32	5.7
Non-traffic transport accidents	4	1	1.13	0.44–2.91	4.5
Other transport	3	1	0.85	0.29–2.50	3.4
Inanimate mechanical forces	<3	s	s	s	s
Other or unspecified land transport	<3	s	s	s	s
Other causes	15	3	4.25	2.57–7.01	17.0
Total	88	18	24.93	20.23–30.70	100.0
West Coast					
0–14 year olds					
Non-traffic transport accidents	<3	s	s	s	s
Inanimate mechanical forces	<3	s	s	s	s
Road traffic	<3	s	s	s	s
Suffocation	<3	s	s	s	s
Total	5	1	15.68	6.70–36.70	100.0
15–24 year olds					
Road traffic	11	2	60.70	33.90–108.67	61.1
Inanimate mechanical forces	5	1	27.59	11.79–64.58	27.8
Non-traffic transport accidents	<3	s	s	s	s
Poisoning	<3	s	s	s	s
Total	18	4	99.33	62.84–156.97	100.0

Numerator: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population



Table 32. Deaths due to unintentional injuries in 0–24 year olds, by age group and cause of injury, Southern DHB 2008–2012

Deaths by cause of unintentional injury	Number: 2008–2012	Number: annual average	Rate per 100,000 population	95% CI	Per cent
Southern DHB					
0–14 year olds					
Non-traffic transport accidents	3	1	1.08	0.43–3.73	27.3
Suffocation	<3	s	s	s	s
Inanimate mechanical forces	<3	s	s	s	s
Animate mechanical forces	<3	s	s	s	s
Road traffic	<3	s	s	s	s
Thermal	<3	s	s	s	s
Drowning or submersion	<3	s	s	s	s
Other transport	<3	s	s	s	s
Total	11	2	3.96	2.60–8.33	100.0
15–24 year olds					
Road traffic	36	7	15.23	11.0–21.1	60.0
Poisoning	8	2	3.38	1.72–6.68	13.3
Drowning or submersion	4	1	1.69	0.66–4.35	6.7
Falls	4	1	1.69	0.66–4.35	6.7
Other transport	3	1	1.27	0.43–3.73	5.0
Thermal	<3	s	s	s	s
Non-traffic transport accidents	<3	s	s	s	s
Inanimate mechanical forces	<3	s	s	s	s
Total	60	12	25.38	19.7–32.7	100.0

Numerator: National Mortality Collection; Denominator: Statistics NZ Estimated Resident Population

Between 2010 and 2014, falls was the leading cause of hospitalisations among 0–14 year olds in all South Island DHBs, contributing over 40% of the injury hospitalisations. The next most common cause of injury was inanimate mechanical forces which contributed around 20% to each of the DHBs hospitalisation rates for this age group. The two most common causes of injury hospitalisations for 15–24 year olds during this time period were falls and inanimate mechanical forces, except on the West Coast where road traffic injury was the most common reason for hospitalisation (**Table 33–Table 37**).

Table 33. Hospitalisations from unintentional injuries in 0–24 year olds, by age group and cause of injury, Nelson Marlborough DHB 2010–2014

Hospitalisations by main external cause of unintentional injury	Number: 2010–2014	Number: annual average	Rate per 100,000 population	95% CI	Per cent
Nelson Marlborough					
0–14 year olds					
Falls	548	110	408.09	375.38–443.63	43.4
Inanimate mechanical forces	221	44	164.57	144.27–187.73	17.5
Poisoning	85	17	63.30	51.20–78.25	6.7
Non-traffic transport incidents	84	17	62.55	50.53–77.43	6.7
<i>Vehicle occupant</i>	<5	s	s	s	s
<i>Motorbike</i>	25	5	18.62	12.61–27.48	2.0
<i>Cyclist</i>	44	9	32.77	24.41–43.98	3.5
<i>Pedestrian</i>	<5	s	s	s	s
<i>Other or unspecified</i>	8	2	5.96	3.02–11.76	0.6
Thermal	56	11	41.70	32.12–54.14	4.4
Road traffic crash	55	11	40.96	31.47–53.30	4.4
<i>Vehicle occupant</i>	12	2	8.94	5.11–15.62	1.0
<i>Motorbike</i>	<5	s	s	s	s
<i>Cyclist</i>	25	5	18.62	12.61–27.48	2.0
<i>Pedestrian</i>	15	3	11.17	6.77–18.43	1.2
<i>Other or unspecified</i>	0	..	..	..	..
Other or unspecified land transport	21	4	15.64	10.23–23.91	1.7
Other transport	<5	s	s	s	s
Animate mechanical forces	47	9	35.00	26.32–46.54	3.7
Suffocation	21	4	15.64	10.23–23.91	1.7
Drowning or submersion	<5	s	s	s	s
Other causes	113	23	84.15	70.00–101.15	8.9
Undetermined intent	5	1	3.72	1.59–8.72	0.4
Total	1,263	253	940.53	890.29–993.58	100.0
15–24 year olds					
Falls	224	45	297.19	260.78–338.67	20.2
Inanimate mechanical forces	223	45	295.87	259.54–337.26	20.1
Road traffic crash	160	32	212.28	181.86–247.78	14.4
<i>Vehicle occupant</i>	97	19	128.70	105.52–156.96	8.7
<i>Motorbike</i>	34	7	45.11	32.28–63.03	3.1
<i>Cyclist</i>	24	5	31.84	21.40–47.38	2.2
<i>Pedestrian</i>	<5	s	s	s	s
<i>Other or unspecified</i>	<5	s	s	s	s
Non-traffic transport incidents	141	28	187.07	158.66–220.57	12.7
<i>Vehicle occupant</i>	6	1	7.96	3.65–17.37	0.5
<i>Motorbike</i>	78	16	103.49	82.94–129.13	7.0
<i>Cyclist</i>	41	8	54.40	40.10–73.78	3.7
<i>Pedestrian</i>	<5	s	s	s	s
<i>Other or unspecified</i>	13	3	17.25	10.08–29.51	1.2
Other or unspecified land transport	31	6	41.13	28.98–58.37	2.8
Other transport	<5	s	s	s	s
Animate mechanical forces	75	15	99.51	79.40–124.70	6.8
Thermal	26	5	34.50	23.54–50.54	2.3
Poisoning	22	4	29.19	19.28–44.19	2.0
Suffocation	<5	s	s	s	s
Drowning or submersion	<5	s	s	s	s
Other causes	172	34	228.20	196.58–264.90	15.5
Undetermined intent	30	6	39.80	27.88–56.82	2.7
Total	1,111	222	1,474.03	1,390.44–1,562.58	100.0

Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population

Table 34. Hospitalisations from unintentional injuries in 0–24 year olds, by age group and cause of injury, South Canterbury DHB 2010–2014

Hospitalisations by main external cause of unintentional injury	Number: 2010–2014	Number: annual average	Rate per 100,000 population	95% CI	Per cent
South Canterbury					
0–14 year olds					
Falls	233	47	440.33	387.40–500.46	43.0
Inanimate mechanical forces	90	18	170.09	138.41–209.00	16.6
Non-traffic transport incidents	53	11	100.16	76.59–130.98	9.8
<i>Vehicle occupant</i>	<5	s	s	s	s
<i>Motorbike</i>	15	3	28.35	17.18–46.77	2.8
<i>Cyclist</i>	29	6	54.81	38.16–78.70	5.4
<i>Pedestrian</i>	<5	s	s	s	s
<i>Other or unspecified</i>	<5	s	s	s	s
Road traffic crash	37	7	69.92	50.74–96.36	6.8
<i>Vehicle occupant</i>	12	2	22.68	12.97–39.64	2.2
<i>Motorbike</i>	<5	s	s	s	s
<i>Cyclist</i>	13	3	24.57	14.36–42.03	2.4
<i>Pedestrian</i>	9	2	17.01	8.95–32.33	1.7
<i>Other or unspecified</i>	1	0	1.89	0.33–10.71	0.2
Other or unspecified land transport	10	2	18.90	10.27–34.79	1.8
Other transport	<5	s	s	s	s
Poisoning	34	7	64.25	45.99–89.77	6.3
Animate mechanical forces	23	5	43.47	28.97–65.22	4.2
Thermal	19	4	35.91	22.99–56.08	3.5
Suffocation	6	1	11.34	5.20–24.74	1.1
Drowning or submersion	<5	s	s	s	s
Other causes	24	5	45.36	30.48–67.48	4.4
Undetermined intent	10	2	18.90	10.27–34.79	1.8
Total	542	108	1,024.30	941.99–1,113.72	100.0
15–24 year olds					
Falls	118	24	365.49	305.31–437.48	23.0
Road traffic crash	98	20	303.54	249.16–369.75	19.1
<i>Vehicle occupant</i>	73	15	226.11	179.88–284.17	14.2
<i>Motorbike</i>	13	3	40.27	23.53–68.89	2.5
<i>Cyclist</i>	<5	s	s	s	s
<i>Pedestrian</i>	6	1	18.58	8.52–40.54	1.2
<i>Other or unspecified</i>	<5	s	s	s	s
Inanimate mechanical forces	92	18	284.96	232.43–349.31	17.9
Non-traffic transport incidents	49	10	151.77	114.83–200.57	9.5
<i>Vehicle occupant</i>	6	1	18.58	8.52–40.54	1.2
<i>Motorbike</i>	23	5	71.24	47.48–106.88	4.5
<i>Cyclist</i>	6	1	18.58	8.52–40.54	1.2
<i>Pedestrian</i>	<5	s	s	s	s
<i>Other or unspecified</i>	12	2	37.17	21.26–64.96	2.3
Other or unspecified land transport	13	3	40.27	23.53–68.89	2.5
Other transport	<5	s	s	s	s
Animate mechanical forces	31	6	96.02	67.65–136.26	6.0
Thermal	14	3	43.36	25.83–72.78	2.7
Poisoning	8	2	24.78	12.56–48.89	1.6
Suffocation	<5	s	s	s	s
Drowning or submersion	0	..	..	..	..
Other causes	31	6	96.02	67.65–136.26	6.0
Undetermined intent	56	11	173.45	133.61–225.15	10.9
Total	514	103	1,592.04	1,461.15–1,734.44	100.0

Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population

Table 35. Hospitalisations from unintentional injuries in 0–24 year olds, by age group and cause of injury, Canterbury DHB 2010–2014

Hospitalisations by main external cause of unintentional injury	Number: 2010–2014	Number: annual average	Rate per 100,000 population	95% CI	Per cent
Canterbury					
0–14 year olds					
Falls	2,569	514	542.65	522.12–563.98	47.4
Inanimate mechanical forces	1,125	225	237.63	224.16–251.91	20.8
Animate mechanical forces	352	70	74.35	66.98–82.53	6.5
Poisoning	338	68	71.40	64.18–79.42	6.2
Non-traffic transport incidents	228	46	48.16	42.30–54.83	4.2
<i>Vehicle occupant</i>	<5	s	s	s	s
<i>Motorbike</i>	69	14	14.57	11.52–18.44	1.3
<i>Cyclist</i>	114	23	24.08	20.05–28.92	2.1
<i>Pedestrian</i>	14	3	2.96	1.76–4.96	0.3
<i>Other or unspecified</i>	29	6	6.13	4.27–8.80	0.5
Road traffic crash	166	33	35.06	30.12–40.82	3.1
<i>Vehicle occupant</i>	37	7	7.82	5.67–10.77	0.7
<i>Motorbike</i>	13	3	2.75	1.60–4.70	0.2
<i>Cyclist</i>	78	16	16.48	13.20–20.56	1.4
<i>Pedestrian</i>	37	7	7.82	5.67–10.77	0.7
<i>Other or unspecified</i>	<5	s	s	s	s
Other or unspecified land transport	71	14	15.00	11.89–18.91	1.3
Other transport	7	1	1.48	0.72–3.05	0.1
Thermal	159	32	33.59	28.76–39.23	2.9
Suffocation	43	9	9.08	6.74–12.23	0.8
Drowning or submersion	14	3	2.96	1.76–4.96	0.3
Other causes	326	65	68.86	61.78–76.75	6.0
Undetermined intent	18	4	3.80	2.41–6.01	0.3
Total	5,416	1,083	1,144.01	1,114.11–1,174.70	100.0
15–24 year olds					
Inanimate mechanical forces	1,119	224	315.31	297.40–334.30	27.7
Falls	1,003	201	282.63	265.69–300.64	24.8
Road traffic crash	576	115	162.31	149.59–176.10	14.2
<i>Vehicle occupant</i>	312	62	87.92	78.69–98.22	7.7
<i>Motorbike</i>	120	24	33.81	28.28–40.43	3.0
<i>Cyclist</i>	92	18	25.92	21.14–31.79	2.3
<i>Pedestrian</i>	48	10	13.53	10.20–17.93	1.2
<i>Other or unspecified</i>	<5	s	s	s	s
Animate mechanical forces	353	71	99.47	89.62–110.39	8.7
Non-traffic transport incidents	286	57	80.59	71.78–90.48	7.1
<i>Vehicle occupant</i>	15	3	4.23	2.56–6.97	0.4
<i>Motorbike</i>	111	22	31.28	25.98–37.66	2.7
<i>Cyclist</i>	97	19	27.33	22.41–33.34	2.4
<i>Pedestrian</i>	5	1	1.41	0.60–3.30	0.1
<i>Other or unspecified</i>	58	12	16.34	12.64–21.12	1.4
Other or unspecified land transport	82	16	23.11	18.62–28.68	2.0
Other transport	13	3	3.66	2.14–6.27	0.3
Thermal	96	19	27.05	22.15–33.03	2.4
Poisoning	81	16	22.82	18.37–28.36	2.0
Drowning or submersion	6	1	1.69	0.77–3.69	0.1
Suffocation	5	1	1.41	0.60–3.30	0.1
Other causes	395	79	111.30	100.86–122.83	9.8
Undetermined intent	32	6	9.02	6.39–12.73	0.8
Total	4,047	809	1,140.37	1,105.96–1,175.83	100.0

Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population

Table 36. Hospitalisations from unintentional injuries in 0–24 year olds, by age group and cause of injury, West Coast DHB 2010–2014

Hospitalisations by main external cause of unintentional injury	Number: 2010–2014	Number: annual average	Rate per 100,000 population	95% CI	Per cent
West Coast					
0–14 year olds					
Falls	172	34	544.92	469.50–632.37	44.8
Inanimate mechanical forces	73	15	231.27	184.00–290.67	19.0
Animate mechanical forces	28	6	88.71	61.38–128.18	7.3
Non-traffic transport incidents	24	5	76.04	51.10–113.12	6.3
<i>Vehicle occupant</i>	<5	s	s	s	s
<i>Motorbike</i>	11	2	34.85	19.46–62.40	2.9
<i>Cyclist</i>	9	2	28.51	15.00–54.19	2.3
<i>Pedestrian</i>	<5	s	s	s	s
<i>Other or unspecified</i>	<5	s	s	s	s
Road traffic crash	23	5	72.87	48.56–109.32	6.0
<i>Vehicle occupant</i>	10	2	31.68	17.21–58.31	2.6
<i>Motorbike</i>	<5	s	s	s	s
<i>Cyclist</i>	6	1	19.01	8.71–41.47	1.6
<i>Pedestrian</i>	<5	s	s	s	s
<i>Other or unspecified</i>	0	..	..	..	..
Other or unspecified land transport	7	1	22.18	10.74–45.77	1.8
Other transport	<5	s	s	s	s
Thermal	19	4	60.19	38.54–94.00	4.9
Poisoning	18	4	57.03	36.08–90.13	4.7
Suffocation	<5	s	s	s	s
Drowning or submersion	<5	s	s	s	s
Other causes	10	2	31.68	17.21–58.31	2.6
Undetermined intent	<5	s	s	s	s
Total	384	77	1,216.56	1,101.42–1,343.58	100.0
15–24 year olds					
Road traffic crash	89	18	486.15	395.26–597.82	23.5
<i>Vehicle occupant</i>	64	13	349.59	273.88–446.13	16.9
<i>Motorbike</i>	17	3	92.86	57.99–148.67	4.5
<i>Cyclist</i>	<5	s	s	s	s
<i>Pedestrian</i>	5	1	27.31	11.67–63.93	1.3
<i>Other or unspecified</i>	0	0	0.00	0.00–20.98	0.0
Falls	80	16	436.99	351.28–543.49	21.1
Inanimate mechanical forces	70	14	382.36	302.78–482.77	18.5
Non-traffic transport incidents	37	7	202.11	146.67–278.44	9.8
<i>Vehicle occupant</i>	<5	s	s	s	s
<i>Motorbike</i>	18	4	98.32	62.20–155.38	4.7
<i>Cyclist</i>	9	2	49.16	25.87–93.41	2.4
<i>Pedestrian</i>	<5	s	s	s	s
<i>Other or unspecified</i>	5	1	27.31	11.67–63.93	1.3
Other or unspecified land transport	<5	s	s	s	s
Other transport	0	..	..	..	..
Animate mechanical forces	22	4	120.17	79.38–181.90	5.8
Thermal	15	3	81.94	49.66–135.15	4.0
Poisoning	15	3	81.94	49.66–135.15	4.0
Suffocation	<5	s	s	s	s
Drowning or submersion	<5	s	s	s	s
Other causes	37	7	202.11	146.67–278.44	9.8
Undetermined intent	8	2	43.70	22.14–86.21	2.1
Total	379	76	2,070.23	1,873.80–2,286.77	100.0

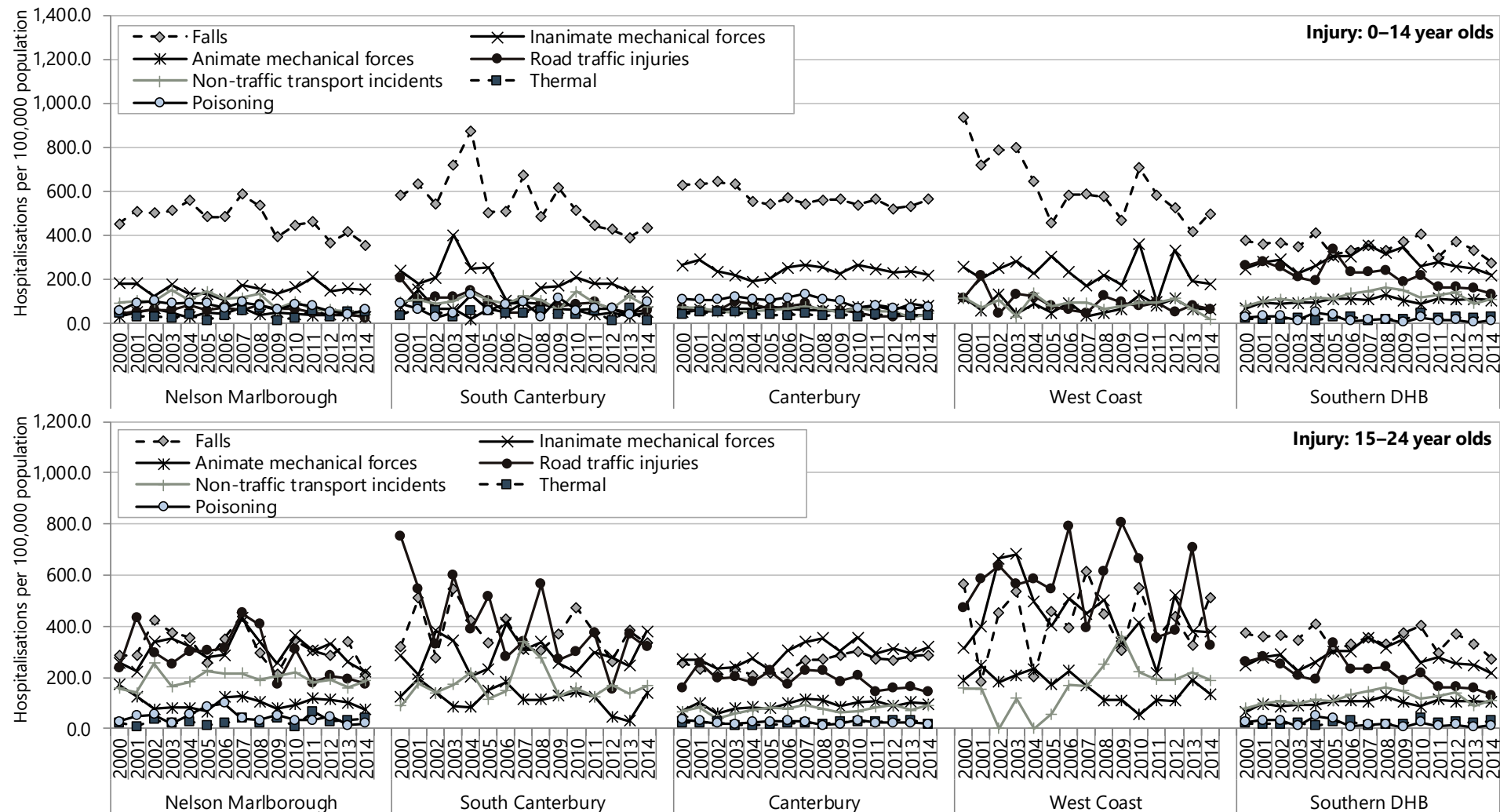
Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population

Table 37. Hospitalisations from unintentional injuries in 0–24 year olds, by age group and cause of injury, Southern DHB 2010–2014

Hospitalisations by main external cause of unintentional injury	Number: 2010–2014	Number: annual average	Rate per 100,000 population	95% CI	Per cent
Southern DHB					
0–14 year olds					
Falls	1,075	215	383.68	361.46–407.27	43.7
Inanimate mechanical forces	459	92	163.82	149.52–179.50	18.6
Non-traffic transport incidents	177	35	63.17	54.53–73.19	7.2
<i>Vehicle occupant</i>	6	1	2.14	0.98–4.67	0.2
<i>Motorbike</i>	66	13	23.56	18.52–29.97	2.7
<i>Cyclist</i>	71	14	25.34	20.09–31.96	2.9
<i>Pedestrian</i>	12	2	4.28	2.45–7.49	0.5
<i>Other or unspecified</i>	22	4	7.85	5.19–11.89	0.9
Animate mechanical forces	158	32	56.39	48.26–65.89	6.4
Poisoning	158	32	56.39	48.26–65.89	6.4
Thermal	105	21	37.48	30.96–45.36	4.3
Road traffic crash	104	21	37.12	30.64–44.97	4.2
<i>Vehicle occupant</i>	28	6	9.99	6.91–14.44	1.1
<i>Motorbike</i>	11	2	3.93	2.19–7.03	0.4
<i>Cyclist</i>	40	8	14.28	10.49–19.44	1.6
<i>Pedestrian</i>	22	4	7.85	5.19–11.89	0.9
<i>Other or unspecified</i>	<5	s	s	s	s
Other or unspecified land transport	29	6	10.35	7.21–14.86	1.2
Other transport	6	1	2.14	0.98–4.67	0.2
Suffocation	30	6	10.71	7.50–15.29	1.2
Drowning or submersion	10	2	3.57	1.94–6.57	0.4
Other causes	126	25	44.97	37.78–53.54	5.1
Undetermined intent	25	5	8.92	6.04–13.17	1.0
Total	2,462	492	878.73	844.83–913.96	100.0
15–24 year olds					
Falls	791	158	334.66	312.17–358.77	28.6
Inanimate mechanical forces	593	119	250.89	231.52–271.88	21.4
Road traffic crash	393	79	166.27	150.64–183.53	14.2
<i>Vehicle occupant</i>	244	49	103.23	91.07–117.02	8.8
<i>Motorbike</i>	69	14	29.19	23.07–36.94	2.5
<i>Cyclist</i>	50	10	21.15	16.05–27.89	1.8
<i>Pedestrian</i>	24	5	10.15	6.82–15.11	0.9
<i>Other or unspecified</i>	6	1	2.54	1.16–5.54	0.2
Non-traffic transport incidents	276	55	116.77	103.79–131.38	10.0
<i>Vehicle occupant</i>	18	4	7.62	4.82–12.04	0.7
<i>Motorbike</i>	160	32	67.69	57.99–79.02	5.8
<i>Cyclist</i>	68	14	28.77	22.70–36.47	2.5
<i>Pedestrian</i>	8	2	3.38	1.72–6.68	0.3
<i>Other or unspecified</i>	22	4	9.31	6.15–14.09	0.8
Other or unspecified land transport	71	14	30.04	23.82–37.88	2.6
Other transport	17	3	7.19	4.49–11.52	0.6
Animate mechanical forces	244	49	103.23	91.07–117.02	8.8
Thermal	66	13	27.92	21.95–35.52	2.4
Poisoning	32	6	13.54	9.59–19.11	1.2
Suffocation	5	1	2.12	0.90–4.95	0.2
Drowning or submersion	5	1	2.12	0.90–4.95	0.2
Other causes	190	38	80.39	69.74–92.65	6.9
Undetermined intent	83	17	35.12	28.33–43.53	3.0
Total	2,766	553	1,170.26	1,127.69–1,214.42	100.0

Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population

Figure 18. Hospitalisations from injuries in 0–24 year olds, by age group, year of discharge, and injury type, South Island DHBs 2000–2014



Numerator: National Minimum Dataset (acute and arranged admissions; excludes ED cases); Denominator: Statistics NZ Estimated Resident Population; Caution: West Coast rates for land transport (non-traffic) are affected by small number variation





# Evidence for good practice for the prevention of injury

## New Zealand policy documents

Ministry of Transport. **Safer Journeys: New Zealand's Road Safety Strategy 2010–2020**

<http://www.transport.govt.nz/saferjourneys/Documents/SaferJourneyStrategy.pdf>

Increasing the safety of young drivers is a major priority in the Road Safety Strategy 2010–2020. The aim is to reduce road fatality rates for young people from 21 per 100,000 to a rate similar to Australia (13 per 100,000). Proposed strategies include multiple policy and practice initiatives across four key areas: safe roads and roadsides, safe speeds, safe vehicles and safe road use. The strategy reflects a programme designed to address some of the risk factors that research has identified but also to actively engage the community in acting positively to increase road safety.

New Zealand Water Safety Sector Strategy 2020 <http://www.watersafety.org.nz/our-sector/water-safety-sector-strategy-2020/>

The New Zealand Water Safety Sector has collectively developed and published in 2015, the Water Safety Sector Strategy 2020. In the face of New Zealand having the 8<sup>th</sup> highest drowning rate in the OECD, the Strategy provides describes the problem and identifies a set of outcomes and goals. Its goals are to reduce preventable drowning deaths by 35%, reduce drowning hospitalisations by 42%, halve the male drowning rate and reduce pre-school drowning to zero by 2020. These are to be reached by the sector working collectively so that all New Zealanders enjoy the water safely.

Ministry of Business Industry and Enterprise **Working Safer: a blueprint for health and safety at work**

<http://www.mbie.govt.nz/info-services/employment-skills/workplace-health-and-safety-reform/document-and-image-library/safety-first-blueprint.pdf>

The Working Safer Blueprint spells out the intention to reduce the unacceptably high rates of fatalities and serious injuries in the workplace by at least 25% by 2020. It quotes the principle included in the report of the Royal Commission on the Pike River Tragedy that "health and safety in New Zealand can be improved only by the combined efforts of government, employers and workers." The blueprint does not specify young people within the document, however, it is relevant to young people who are in the workforce.

## International guidelines

NICE – National Institute for Health and Care Excellence <http://www.nice.org.uk/>

Unintentional injuries among under – 15s overview

<http://pathways.nice.org.uk/pathways/unintentional-injuries-among-under-15s>

<http://www.nice.org.uk/guidance/ph30>, <http://www.nice.org.uk/guidance/ph31>

The Pathway provides guidelines for preventing unintentional injury to children. The first of a series of three guidelines provides recommendations for national and local strategy, policy and development and setting specific paths for health services, local authorities, highway authorities, police, fire and rescue services, schools and for private and public outdoor play. Topics include off road cycling, home visiting, water safety, and road safety. The second and third of the set of Guidances (PH30, PH31) provide more specific recommendations for preventing unintentional injuries in the home and on the road.

Head injuries quality standard (QS74) and Head injuries assessment and early management (CG176)

<https://www.nice.org.uk/guidance/conditions-and-diseases/injuries-accidents-and-wounds/head-injuries>

In addition to the injury prevention guidance, NICE is developing a set of pathways for injuries, accidents and wounds. These include head injuries, trauma, wound management and general injury, accidents and wounds. The head injury quality standard and assessment and early management guidelines have been completed while guidance or advice for others is to be published in February 2016. While being based in the UK system and not specifically for children, guidance is based on research evidence and therefore has relevance to the New Zealand setting.

## Systematic reviews: Home safety

Kendrick D, Mulvaney C, Ye, L et al **Parenting interventions for the prevention of unintentional injuries in childhood** Cochrane Database of Systematic Reviews. (2013) (6).

Kendrick et al examined 22 studies (including 16 RCTs) among which were 15 home visiting programmes and 2 paediatric practice-based interventions. The families in 19 of the studies were from families in socioeconomically disadvantaged populations and were considered to be at risk of adverse child outcomes. The authors' meta-analysis (10 studies, 5074 participants) indicated that intervention families had a statistically significant lower risk of injury than control families. The authors concluded that "parenting programmes are effective in reducing unintentional injury in children and can improve home safety, particularly in families who may be considered 'at risk,' such as some teenage or single mothers. It would be worthwhile for health and social care providers to make parenting programmes available to families".

Kendrick D, Young B, Masonjones AJ et al **Home safety education and provision of safety equipment for injury prevention.** Cochrane Database of Systematic Reviews. (2014)(10)

This systematic review involved examining 98 studies (2,605,044 people) of which 54 were included in the meta-analysis (812,705 people), and of these 35 were RCTs. The criteria were for home safety education with or without the provision of safety equipment for those aged  $\leq 19$  years and which reported injury, safety practices or possession of safety equipment. The main conclusion was that home safety interventions that provide face-to-face, one-to-one education and provision of safety equipment may reduce injury rates, particularly if they are provided at home. The review notes conflicting findings on the provision of equipment. There was no evidence, however, that home safety education was less effective in those participants at greater risk of injury. Further research is required however to confirm these findings.

#### Systematic reviews: Road safety

Ehiri JE, Ejere ODH, Magnussen L et al. Interventions for promoting booster seat use in four to eight year olds travelling in motor vehicles. Cochrane Database of Systematic Reviews (2012)(11)

It has been recommended that booster seats be used for children aged from around 4 to 8 years to reduce the potential for injury in the event of a crash. Various interventions have been implemented to increase the use of these booster seats. This review examines the effectiveness of the interventions to increase acquisition and use of the booster seats in the target audience. Five studies (3,070 participants) were examined and all showed a positive effect. The effective interventions included incentives combined with education, distribution of free booster seats with education and education only. The study in which the intervention was enforcement of the law demonstrated no marked beneficial effect, although before and after studies that did not meet the inclusion criteria for the meta-analysis did show some beneficial effect of legislation.

Kardamanidis K, Martiniuk A, Ivers RQ, Stevenson MR, Thistlethwaite K. **Motorcycle rider training for the prevention of road traffic crashes.** Cochrane Database of Systematic Reviews 2010, Issue 10. Art. No.: CD005240. DOI: 10.1002/14651858.CD005240.pub2

This review considered evaluations of the effectiveness of motorcycle rider courses in reducing the number of traffic offences, crashes, injuries and death. There was a variety of content and delivery within the 23 research studies included in the review. The evidence was unclear as to whether training reduces any of these outcomes, and what kind of training is most effective. The authors concluded they could not recommend a particular type of rider training. They did note that some form of rider training was necessary for learning basic motorcycle handling techniques and to ride a motorcycle safely and that further research was required.

Thompson DC, Rivara F, Thompson R. **Helmets for preventing head and facial injuries in bicyclists.** Cochrane Database of Systematic Reviews (2009) (4)

The main conclusion from this review of cycle helmets was that helmets provide between 63 to 88% reduction in the risk of head, brain and severe brain injury. This is for all ages of riders. This conclusion was based on the results of five case control studies that met the inclusion criteria and were considered well conducted. Helmets are considered to provide protection for events involving motor vehicle crashes (69%) as well as other causes (68%).

#### Systematic review: water safety

Leavy JE, Crawford G, Leaversuch F, et al. A review of drowning prevention interventions for children and young people in high, low and middle income countries. Journal Community Health DOI 10.1007/s10900-015-0105-2 October 2015.

The authors of this review identified 15 studies from five different countries that met PRISMA criteria. The studies examined were varied, with more than seven designs utilised and the age of the participants, duration, strategies and evaluation measures and outcomes varied between interventions. All used aspects of the International Life Saving Federation (ILSF) drowning prevention chain-control measures (education and information, denial of access, supervision and acquisition of survival skills): 40% of the studies depended on education and information. Only three studies used a multi-themed approach while supervision was a key theme in two studies. While the review identifies considerable limitations in all the studies, for example because of their over reliance on self-report and focus on short term effects, the authors provide a useful analysis for intervention studies.

#### Systematic reviews: Sport and recreational injury

Rossler R, Donath L, Verhagen E et al. **Exercise-based injury prevention in child and adolescent sport: a systematic review and meta-analysis.** Sports Med. 2014;44(12):1733-48. doi: 10.1007/s40279-014-0234-2.

Conclusions drawn following examination of 21 trials conducted on 27,561 athletes with an age range of 10.7 to 17.8 years were that there was good evidence that there were beneficial effects of exercise based injury prevention programmes for organised youth sports. Programmes focusing on specific injuries and injuries in general showed significant reductions and girls benefited more than boys. Multimodal programmes that included jumping/plyometric exercises were recommended. However, there is little data for effects of such programmes for children  $< 14$  years and for individual sports.

Brussoni MJ, Olsen LL, Pike I, Sleet DA. **Risky play and children's safety: balancing priorities for optimal child development** *Int. J. Environ. Res. Public Health* 2012; 9(9): 3134-3148.

This review examines the role of injury prevention and its relationship between child development, play and concepts of risk taking. This is a useful review to inform discussion around the debate of whether children are over-protected. The authors suggest a modification to the safety paradigm to aim to create an environment for children that is "as safe as necessary" rather than "as safe as possible". They discuss the options for increasing opportunities for play, the importance of play and the effects of parents curtailing children's activities and the potential reactive response may be problematic for the interventions that have made a major difference to injury death and hospitalisations for children, such as child car restraints

#### Data links – New Zealand

Statistics New Zealand. Injury Information Portal [http://search.stats.govt.nz/browse\\_for\\_stats/health/injuries.aspx](http://search.stats.govt.nz/browse_for_stats/health/injuries.aspx)

This website provides links to various websites that provide data on New Zealand injury.

Injury Prevention Research Unit. **New Zealand Injury Query System** <http://ipru3.otago.ac.nz/nigs/>

Visitors to this website can select from year range, age range, cause of injury, intent, gender, region (district health board, territorial local authority, all New Zealand) to create tables of for injury, either fatal or non-fatal. The data come from public hospital discharge data and the New Zealand Coronial Service. A customised enquiries service is also available.

New Zealand Child and Youth Mortality Review Committee. **10th Data Report 2009-2013.** <http://www.hqsc.govt.nz/assets/CYMRC/Publications/tenth-data-report-2009-2013.pdf> (2014)

The Health Quality and Safety Commission publish an annual report from the NZ Child Mortality Review Group in which the data on deaths to those aged between 0 to 24 years are presented in 5-year age groups. It uses the underlying cause of death classification from the Ministry of Health's Mortality Collection.

#### International reports

World Health Organization. **Injuries and Violence: The Facts.** 2014

[http://apps.who.int/iris/bitstream/10665/149798/1/9789241508018\\_eng.pdf?ua=1&ua=1](http://apps.who.int/iris/bitstream/10665/149798/1/9789241508018_eng.pdf?ua=1&ua=1)

This publication outlines the magnitude of death from injury in the global context, noting that more than 5 million people die each year as a result of injuries. Of these 24% are road traffic injuries and the report notes that road traffic injuries are the leading cause of death among 15–29 year olds worldwide. Evidence-based measures to reduce main causes of injury death are listed which are relevant to the New Zealand context.

Peden M, Oyegbite K, Ozanne-Smith J et al (eds). **World report on child injury prevention** World Health Organization and Unicef 2008 [http://www.unicef.org/eapro/World\\_report.pdf](http://www.unicef.org/eapro/World_report.pdf)

The World report notes that for each area of child injury, there are proven ways to reduce the likelihood and severity of injury. Much of the problem is a lack of awareness of the problem and the lack of political will to make a difference. While this report was published in 2008 and includes much directed towards middle income countries, in its examination of each area of injury, it contains interventions that are current, known to be effective and many are relevant to New Zealand. Each chapter provides key messages, makes recommendations for reducing childhood injury and offers fact sheets intended for various audiences.

European Public Health Alliance (EPHA) and TACTICS. EPHA Briefing: Mandated responsibility for intentional and Unintentional Child Injury Prevention in Europe focusing on road safety, water safety, home safety and intentional injury. [http://epha.org/IMG/pdf/EPHA\\_Briefing\\_-\\_TACTICS-child\\_safety-Final.pdf](http://epha.org/IMG/pdf/EPHA_Briefing_-_TACTICS-child_safety-Final.pdf) (2014)

The underlying rationale for the development of this brief is the United Nations Convention on the rights of the Child. This document provides a strategy for the member states of the EU to reach a set of objectives to improve the well-being of children. Included are the development of a framework for an evidence based review, the promotion of multisectoral action, and to identify the role of the health sector in developing and coordinating policies and delivering services to meet the health needs of children and young people. Safety for children and young people is one of the seven priority areas for the EU.

