

FACTSHEET: CHILD CYCLING INJURY PREVENTION



Cycling is an important source of exercise, transportation and recreation for children in New Zealand, and for many New Zealand children, learning to ride a bicycle is an important part of their play and development. There are significant benefits for children and their communities associated with cycling, including health benefits such as higher daily levels of physical activity, and better cardiovascular fitness; improved liveability of communities and improved community accessibility and cohesion. However, cycling related injuries are one of the top ten causes of unintentional injury related deaths for children in New Zealand.

Fatal injuries 2003-2007:

In the five year period 2003-2007 a total of 12 children died as a result of cycling- related injuries.¹

- Boys were over-represented in cycling related fatalities: 11 boys died compared to one girl.
- European children accounted for half (6) of all bicycling related deaths.
- Boys aged 10 – 14 years were at greatest risk of fatal injury, accounting for seven deaths.
- A total of eight children died as a result of a crash involving a motor vehicle and a child cyclist.
- All child cyclist deaths involved boys aged between five to 14 years.
- Tamariki Māori were over represented in bicycling related deaths involving a motor vehicle and child cyclist, accounting for half of all these deaths.

Non-fatal injuries 2005-2009:

Cycling related injuries are one of the top three causes of unintentional injury related hospitalisations for children in New Zealand (5.7 per cent of all child injury hospitalisations).¹ In the five year period 2005-2009 a total of 2,436 child cyclists aged 0 – 14 years were injured severely enough to be admitted to hospital, an average of 487 hospitalisations per year.

- Hospital admissions for cycle injuries were significantly higher for males, for Māori and European children compared to Asian/Indian children, and for children from areas of higher socio-economic deprivation (see Table 1).² Other New Zealand research has identified increased risk of hospital admissions for child cyclist injuries for males and children living in urban areas.³
- Children aged between 10 – 14 years accounted for the highest number of all cyclist hospitalisations (57 per cent).
- Approximately one third of all injuries occurred among children aged five to nine years.
- Child cyclists aged 10 – 14 years had the highest rate of hospitalisation, 14.1 per 100,000 population per year, and they also had the highest risk of non-collision crashes (i.e., falling off a bicycle).⁴⁻⁵
- Boys in New Zealand are over-represented in bicycling related injuries. In the period 2005–2009, more than three times as many boys as girls were admitted to hospital with bicycle related injuries, and the gender difference increased with age, i.e. Boys = 1,890 and Girls = 546.¹
- Most children are injured while cycling on the road or around the home, however for a large number of injuries the scene of the injury is unknown.⁶
- There is limited data available about high-risk times for child cyclist injuries, however data extrapolated from the New Zealand Household Travel survey suggests that children are at increased risk of injury between 4–6pm.⁴
- Approximately 14 per cent of child cyclists aged 0 – 14 years (179) are injured in a crash with a motor vehicle (collision crashes). Children aged 10 – 14 years are at greatest risk, particularly boys. Boys aged 10 – 14 years account for nearly two-thirds (62 per cent) of this group.
- Most children injured in a crash with a motor vehicle are cycling on the road at the time of their injury.

Table 1. Hospital Admissions for Cyclist Injuries in Children Aged 0 – 14 Years by Gender, Ethnicity and NZ Deprivation Index Decile, New Zealand 2006–2010

Variable	Rate	Rate Ratio	95% CI	Variable	Rate	Rate Ratio	95% CI
New Zealand Cyclist Injuries 0–14 Years							
NZ Deprivation Index Decile				NZ Deprivation Index Quintile			
Decile 1	57.7	1.00		Decile 1–2	56.1	1.00	
Decile 2	54.5	0.94	0.79–1.13	Decile 3–4	61.0	1.09	0.96–1.23
Decile 3	65.1	1.13	0.95–1.34	Decile 5–6	64.7	1.15	1.02–1.30
Decile 4	57.2	0.99	0.83–1.18	Decile 7–8	68.5	1.22	1.08–1.37
Decile 5	63.6	1.10	0.93–1.32	Decile 9–10	73.9	1.32	1.18–1.48
Decile 6	65.5	1.14	0.96–1.34	Prioritised Ethnicity			
Decile 7	65.9	1.14	0.96–1.35	European	73.9	1.00	
Decile 8	70.7	1.23	1.04–1.44	Māori	68.1	0.92	0.85–1.00
Decile 9	81.9	1.42	1.21–1.66	Pacific	40.7	0.55	0.47–0.64
Decile 10	67.2	1.16	0.99–1.37	Asian/Indian	26.1	0.35	0.29–0.43
Gender							
Female	31.0	1.00					
Male	98.5	3.18	2.91–3.46				

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population. Note: Rate is per 100,000; Ethnicity is Level 1 Prioritised; Decile is NZDep2001.

Interventions to reduce injuries to child cyclists

Safekids New Zealand recommends that the following interventions are supported to reduce the risk of injury and death to child cyclists.

1. Bicycle helmets

Bicycle helmets are effective in protecting child cyclists against head, brain and facial injuries.¹¹ Children's brains are particularly vulnerable to injury, and cycle helmets provide effective protection for cyclists and reduce the risk of injuries.^{7, 12-13}

Overall, the evidence suggests that wearing a helmet significantly reduces the risk to children of a range of injuries, while conversely the risk of death and serious injury appears increased among those who were not wearing a helmet at the time of their injury.¹⁴⁻¹⁵

In New Zealand, rates of helmet use among cyclists appear high, particularly among children and increases in helmet wearing have resulted in significant decreases in head injuries among cyclists.¹⁶ However, children and parents need to be supported with on-going education and awareness campaigns to ensure that bicycle helmets are appropriately fitted and correctly worn. Poorly fitting helmets have a substantially decreased protective effect, and children whose helmets fit poorly have double the risk of head injury compared to those whose helmets fit properly.¹⁷ Research findings suggest that many children may wear their helmets incorrectly, or have poorly fitting helmets, and strategies to increase the correct use and fitting of cycle helmets are likely to have a positive benefit on reducing the risk of head and brain injuries.¹⁷⁻¹⁸ Helmet wearing appears to decrease among older children¹⁹, and community based interventions should be targeted to appropriately reach older children to ensure they continue to consistently wear appropriately fitted bicycle helmets.

International data indicates that exposure is an important consideration for cycling injury risk: decreasing bicycle riding leads to increased risk of injury for cyclists, and increased risk of injury leads to decreasing bicycle use.⁷⁻⁸ Similar patterns are evident in New Zealand. Children and adolescents have experienced the greatest increase in the risk of injury, despite a substantial decline in the amount of cycling over the last two decades.^{5, 9} However, if fewer children use bicycles less frequently, they will have less opportunity to develop cycling and road safety skills, increasing their risk of injury as well as decreasing levels of physical activity. An analysis of the fatality rate per unit of exposure across a sample of OECD countries (New Zealand, the Netherlands, Germany, Switzerland, the UK, Norway and Sweden) for children aged 10 – 14 years demonstrated that New Zealand children are particularly vulnerable road users.¹⁰ New Zealand had the second worse fatality rate per 100,000 people divided by the average number of kilometers travelled.

Reducing the speed limit on urban roads is an effective intervention to reduce the risk of child cyclist injuries, as well as the risk of injuries to child pedestrians and other vulnerable road users.²⁸

Local authorities are encouraged to implement further initiatives to reduce speeds on roads which are used by child cyclists.³²⁻³³

Local authorities are also encouraged to develop cycle lanes and paths to separate child cyclists from motor vehicles. Separate cycle lanes and paths will provide protection for child cyclists (and other novice cyclists), and are likely to support increased participation in cycling by children and their families/whanau.³⁴ In addition, communities are encouraged to support 'share the road' campaigns, to create a road user culture where there is increased awareness between drivers and cyclists of each other's needs.^{28, 35}

2. Bicycle skills training

Cycling skills training has a positive effect in increasing knowledge and improving observed riding skills in children who receive training.²⁰⁻²¹ The implementation of a nationwide cycle skills training programme is an important component of supporting the development of confident and capable cyclists, and has the potential to contribute to reductions in injury deaths and hospitalisations for child cyclists. Children and communities are encouraged to participate in the NZTA Cycle Skills training programme.²²

Children under 10 years of age should not cycle on the road unless accompanied by a competent adult cyclist, and careful consideration should be given to the skills of the child, the traffic environment, and their road rule knowledge. Children cycling on the pavement should be encouraged to cycle slowly (at an adult jogging or walking pace), and be alert to risks including pedestrians and cars moving across the pavement from driveways. Acknowledging the increased injury risk for children aged 11 – 14, especially boys; careful supervision alongside bicycle skills training is recommended to support children who transition to cycling on roads.

3. Enhancing the safer use of bicycles as part of children's active travel

Integrating safe and user-friendly cycle routes to schools is an important part of school travel plans.²³⁻²⁴ A national level policy is required to support school travel plans, and to identify opportunities to support children to cycle to school while not increasing the risk for cycling related injuries for child cyclists.²⁵

4. Increasing the visibility of child cyclists

Because of their smaller stature, children are at increased risk of not being seen by other road users, and lack of visibility or conspicuity is an important factor contributing to injury in child cyclist and motor vehicle collisions.^{7, 26} Visibility aids such as bright coloured clothing, high visibility or reflective clothing, lights and reflectors aid the visibility of child cyclists, and child cyclists should be encouraged to wear visibility aids to make it easier for other road users to see them.

5. Engineering interventions and the impact of the built environment on encouraging safer cycling

A number of engineering features can be used to improve the safety of child cyclists, however a comparison of the effectiveness of engineering safety devices used in New Zealand and internationally concluded that there is no single engineering device that can solve transport safety issues among school aged children.²⁷ Overall, engineering devices need to be tailored for individual situations and user groups, and take account of the differences between rural and urban settings. Engineering features that support safety for child cyclists include the development of safe crossing places (particularly on routes to schools), traffic calming measures, school speed zone restrictions, and cycle lanes and paths.²⁷⁻³¹ When planning urban design, Local Authorities are encouraged to implement these features to reduce the risk of injury to child cyclists (as well as other vulnerable road users). Local authorities are also encouraged to develop safe crossing places for children as part of the connectivity of cycle routes for children's safe travel to school and other areas around their communities. Safe crossing places for children will require careful consideration to ensure that they meet the needs of children, which are different to the needs of adult cyclists.

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