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Factsheet

Traffic Related Child Pedestrian Injury

Injury to child pedestrians aged 0 – 14 years is a leading cause of traffic related¹ child deaths in New Zealand. For the five year average (2002-2006), child pedestrian injuries accounted for 31 percent of all traffic related child deaths. For hospital admissions (2004-2008), child pedestrians accounted for 28 percent of all traffic related child injuries.²

A child's physical structure

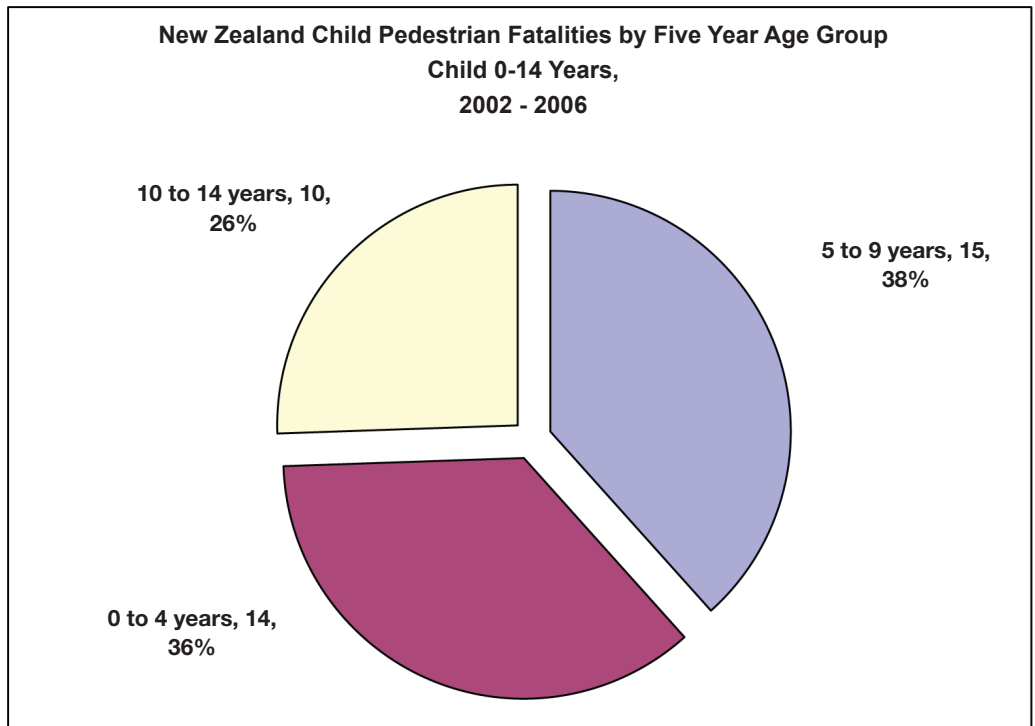
A child's head, chest, abdomen and limbs are all in a state of growth. Their relative softness make a child physically more vulnerable to the impact of injury than an adult. Furthermore, the smaller physical stature of children can create problems, as it limits their ability to see or be seen over certain heights such as parked cars or large trucks – a known risk factor in child pedestrian injuries.³

Key facts

Deaths: See Figure One.

- In New Zealand, traffic related injury to pedestrians aged 0 to 14 years accounts for approximately 10 percent (n=39) (2002 - 2006) of all unintentional child injury deaths.
- On average (2002 - 2006), almost eight (7.8) child pedestrians aged under 15 years die every year in New Zealand.
- Child pedestrians in the 0-4 and 5-9 age groups accounted for the highest percentage of child pedestrian deaths.⁴

Figure One



Source: Data supplied by the Injury Prevention Research Unit (IPRU), University of Otago, 2010. Analysed by Safekids New Zealand.

- On average, more tamariki Māori (Māori children) are being killed as child pedestrians than any other non-Māori children. In the five years (2002 – 2006), tamariki Māori accounted for almost half (49 percent, n=19) of all child pedestrians (n=39) killed in a traffic related crash.⁵

Safekids New Zealand's mission is to reduce the incidence and severity or unintentional injuries to children in New Zealand ages 0-14 years.

Cognitive development ⁶

The developmental processes taking place in children have an effect on their ability to make safe decisions in the road environment, and these processes are closely related to age.⁷

Children's sensory faculties are also less fully developed. Their ability to synthesize information, from their peripheral fields of vision and their auditory sense, is limited, which can lead to their missing critical cues of danger, thus increasing their risk of road traffic injury.⁸

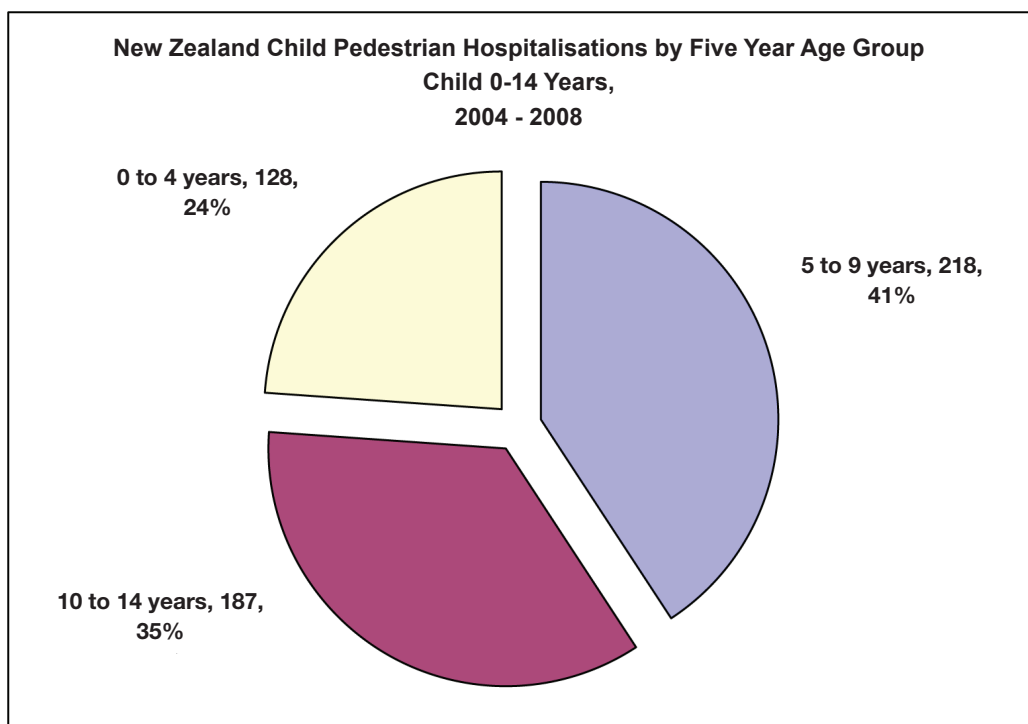
Road traffic crashes involving young children include a large proportion of "dart and dash" cases. In such cases, a child pedestrian is injured through a "critical behavioural error", where they have failed to stop or slow down before attempting to cross the road. This type of behaviour is due to a child's "centration" – the inability of the child to switch attention from one task to another.⁹

These cognitive processes are more developed in children aged 11 years and older who appear to be able to recognize a given road location as dangerous and show judgement that allows them to be safe on the roads.¹⁰

Hospitalisations:

- Annually, on average (2004-2008), 107 child pedestrians are injured severely enough to be admitted to hospital. This is equivalent to at least two child pedestrians admitted to hospital a week.
- Hospital discharge data showed that for the five year average (2004-2008), children in the 5-9 year age group, followed by the 10-14 year age group, have a higher incidence of being injured and hospitalised as pedestrians compared to younger children (0-4 years).¹¹ See Figure Two.

Figure Two



Source: Data supplied by the Injury Prevention Research Unit (IPRU), University of Otago, 2010. Analysed by Safekids New Zealand.

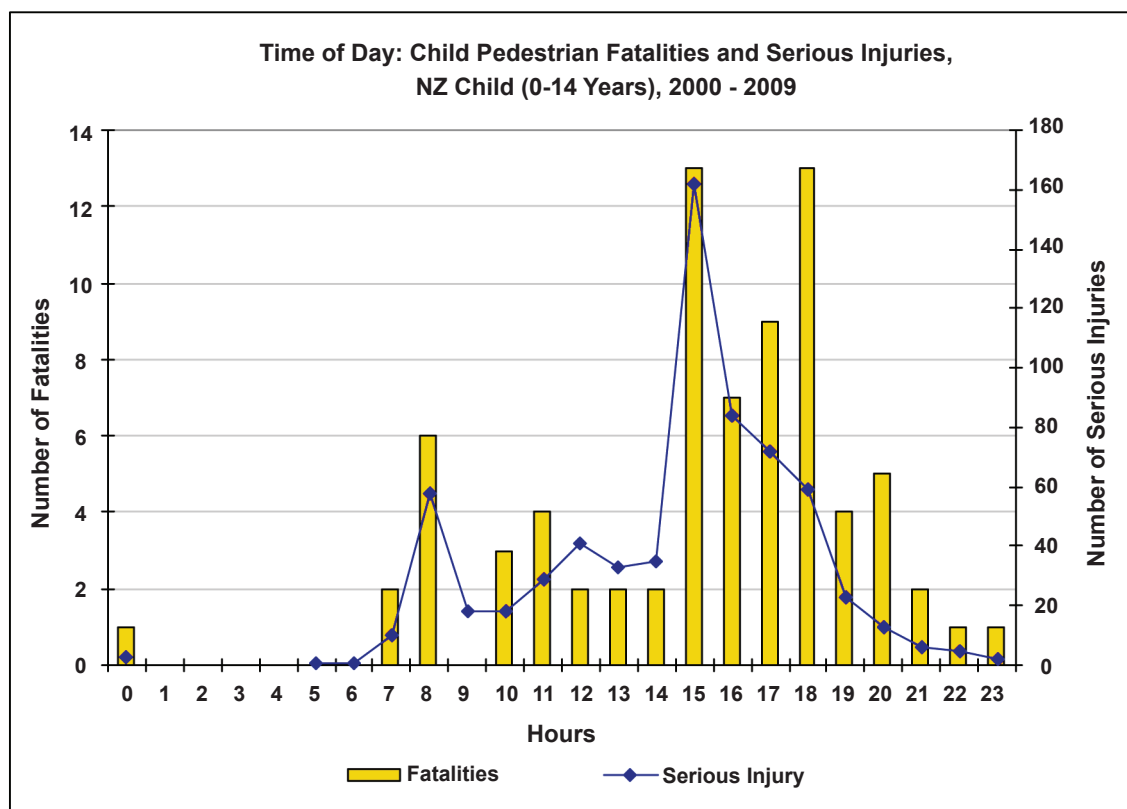
- Māori and Pacific child pedestrians are at greater risk of a pedestrian injury than non-Māori and non-Pacific pedestrians. Māori and Pacific children are more than twice as likely to be admitted to hospital for pedestrian related injuries, than Asian and European children.¹²
- An analysis report produced by Safekids New Zealand on the state of child unintentional injury in New Zealand showed that hospital admissions for child pedestrian injuries were *significantly higher* for both Pacific (50.8 per 100,000) and Māori (44.5 per 100,000) than for Asian (21.0 per 100,000) and European (17.7 per 100,000) children.¹³
- In New Zealand, hospital admissions for child pedestrian injuries were also *significantly higher* for:
 - Males (34.1 per 100,000) than females (20.1 per 100,000).
 - Children in urban areas (29.0 per 100,000) than rural areas (17.9 per 100,000).
 - More deprived areas (51.7 per 100,000) than less deprived areas (13.2 per 100,000).¹⁴

Children in more deprived areas (NZ Deprivation Index 9-10) are almost four times more likely to be hospitalised for child pedestrian injuries than those in less deprived areas (NZ Deprivation Index 1-2).

Features of Child Pedestrian Injury (2000-2009)

- The majority of traffic related injuries involving child pedestrians and vehicles occurred during week days (80 percent).
- Of the child pedestrian crashes where the type of vehicle was known, more than three-quarters (78 percent) involved a Car. This was followed by a Van/ Ute at 13 percent.
- Of the drivers at fault or part fault in child injury crashes, just under two-thirds (64 percent) held a Full drivers licence.
- Of the drivers at fault or part-fault in child pedestrian injury crashes, three out of five (61 percent) were male.¹⁵
- The highest number of child pedestrian fatalities occurred between 3pm – 4pm (1500hrs-1600hrs) and 6pm - 7pm (1800hrs-1900hrs).
- The highest number of child pedestrian serious injuries occurred between 3pm and 4pm (1500hrs-1600hrs). This coincides with the same time as most journeys from school.¹⁶ See Figure Three.

Figure Three



Source: Data accessed via the New Zealand Transport Agency's (NZTA) Crash Analysis System (CAS), 2010. Analysed by Safekids New Zealand.

Note: The number of child pedestrian fatalities and serious injuries are the result of children involved in a traffic related crash.

Case Study: Paediatric Pedestrian Trauma: The Danger After School¹⁷

Children's Trauma Service, Starship Children's Hospital, Auckland, New Zealand

Aim: To examine the demographics of road pedestrian trauma in children in the Auckland region and to provide data that can help target prevention strategies.

Methods: A retrospective analysis was conducted of all children (0–14 years) in the Auckland region admitted to the hospital or killed following a pedestrian versus vehicle injury for the 6-year period 2000–2005. Excluded were pedestrians injured in a driveway.

Results: Over the 6-year period, 364 children were involved in pedestrian crashes resulting in 25 deaths. The median age was 7 years. Males comprised 63%. Pacific Islanders and Māori were over-represented. Three hundred seventeen patients had injury times recorded. Of these, 49% occurred between 3 and 7 pm. Injury peaks for school days showed a tri-modal pattern with injury peaks at 8–9 am, 3–4 pm and 5–6 pm with the 3–4 pm after-school peak predominating.

Conclusion: Prevention strategies should concentrate on the hours after school finishes and should be tailored for Māori and Pacific Island communities.

Further reading: Roberts, I. et al. "Child pedestrian injury rates: the importance of 'exposure to risk' relating to socioeconomic and ethnic differences, in Auckland, New Zealand." *Journal of epidemiology and community health*, 1996, 50(2): 162-165.

Supervision

Research that examined the risk of child pedestrian injury in connection with specific supervision practices showed a strong positive association between pedestrian injury and a lack of supervision both after school and on the journey to school.¹⁸

Key Safety Messages:

- Teach kids how to use pedestrian crossings and controlled intersections safely.
- Use existing, or establish new Walking School Buses.
- School Travel Plans save lives.
- Slow down for kids getting on or off buses - the law says 20 kph (in both directions).

Countries that are best at preventing child traffic injuries have adopted a holistic approach using a wide variety of measures. These include infrastructure improvements, education and publicity programmes aimed at children, caregivers and drivers, increasing the use of safety equipment and speed reduction measures.¹⁹

For more information on advocacy matters refer to the following documents:

- Advocacy for Child Safety:
http://www.safekids.org.nz/index.php/pi_pageid/33
- Safekids Community Falls and Pedestrian Safety Checklist:
<http://www.safekids.org.nz/index.php/page/Pedestrian>



Conclusion

Various research has shown that a child's physical and cognitive developmental factors increase the risk of a road traffic crash among child pedestrians, especially among younger children, where their small physical stature is combined with cognitive limitations to restrict their ability to make safe decisions.²⁰

Statistics from hospital discharge and crash analysis system datasets, together with evidence based research provides sufficient support for prevention strategies for traffic related child pedestrian injuries. Particular emphasis should be placed on Maori and Pacific children, children living in areas of high deprivation, and on the hours mostly associated with a child's journey from school (3pm-4pm).

¹ Note: For the purposes of this factsheet, traffic related crashes between children and motor vehicles take place on public roads.

² Data supplied by the Injury Prevention Research Unit (IPRU), University of Otago, 2010.

³ World Health Organisation *World Report on Child Injury Prevention*, 2008, p. 36.

⁴ Data supplied by the Injury Prevention Research Unit (IPRU), University of Otago, 2010.

⁵ Ibid.

⁶ Note: This is an area of ongoing research and new evidence relating to children's abilities on the road is regularly published.

⁷ Dunbar G, Hill R, Lewis V. "Children's attentional skills and road behaviour." *Journal of Experimental Psychology: Applied*, 2001, 7: 227-234.

⁸ Whitebread D, Neilson K. "The contribution of visual search strategies to the development of pedestrian skills by 4-11 year-old children." *British Journal of Educational Psychology*, 2000, 70: 539-557.

⁹ Pitcairn TK, Edlemann T. "Individual differences in road crossing ability in young children and adults." *British Journal of Psychology*, 2000, 91: 391-410.

¹⁰ Ampofo-Boateng K, Thomson JA. "Children's perception of safety and danger on the road." *British Journal of Psychology*, 1991, 82: 487-505.

¹¹ Data supplied by the Injury Prevention Research Unit (IPRU), University of Otago, 2010.

¹² Safekids New Zealand. *Analysis of Unintentional Child Injury Data in New Zealand: Mortality (2001-2005) and Morbidity (2003-2007)*. Auckland, Safekids New Zealand: 2009, p. 44.

¹³ Ibid.

¹⁴ Ibid.

¹⁵ Unpublished Crash Analysis System Data (2000 - 2009), New Zealand Transport Agency, 2010.

¹⁶ Ibid.

¹⁷ Newbury C, Hsiao K, et al. "Paediatric pedestrian trauma: The danger after school." *Journal of paediatrics and child health*, 2008, 44(9): 488-491.

¹⁸ Joly MF, Foggin PM, Pless IB. "A case-control study of traffic accidents among child pedestrians." pp. 533-536, in: *The vulnerable road user: Proceedings. International Conference on Traffic Safety 27-30 January 1991*. New Delhi, India.

¹⁹ Joint OECD/ ECMT Transport Research Centre, *Keeping Children Safe in Traffic Policy Brief*. 2004.

²⁰ World Health Organisation *World Report on Child Injury Prevention*. 2008, p. 37.