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# **THE AUCKLAND CHILD PEDESTRIAN INJURY STUDY:**

**A Case-Control Study**

**by Ian Gray Roberts**

**A thesis submitted for the degree of  
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at the  
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## SUMMARY

Pedestrian injuries are the leading cause of death in New Zealand children between the ages of one and fourteen years. Although child pedestrian mortality rates are declining, mortality rates in New Zealand are substantially higher than those of comparable motorised countries. For the children who survive pedestrian-motor vehicle collisions, the injuries are often particularly severe. Pedestrian injuries are a leading cause of severe brain injury in childhood, with high levels of long term disability. However, very little is known about the risk factors for child pedestrian injury and as a consequence there are few well established prevention strategies.

The Auckland Child Pedestrian Injury Study is a population based case-control study designed to identify and assess the contribution of potentially modifiable risk factors for pedestrian injuries in childhood. In particular the study was designed to examine the risks associated with traffic volume, vehicle speed, parked vehicles and the availability of safe areas for children's play.

The study was conducted between 1 January 1992 and 1 November 1993. Cases were all children, younger than fifteen years, killed or hospitalised as a result of a pedestrian-motor vehicle collision in the Auckland region. Both motor vehicle traffic and motor vehicle non-traffic (driveway related) pedestrian injury cases were included. Controls were a random

sample of the child population. Two controls were selected for each traffic pedestrian injury case and three for each non-traffic pedestrian injury case. Controls for school aged cases were randomly selected from school rolls. Controls for pre-school cases were selected by first randomly selecting a school aged child and then, using the street address of this school aged child as the starting point, visiting homes until an eligible pre-school control child was found.

The parents of 600 children participated in the study, the parents of 200 cases and the parents of 400 controls. Of the 200 cases, 156 were injured on public roads and 38 were injured in residential driveways, the remaining 6 children were injured in car parks and public parks. The response rate in the case group was 97%, the response rate in the control group was 99%. Exposure information was collected by way of interviewer administered questionnaires and the direct measurement of environment factors.

High traffic volume is a major risk factor for child pedestrian injury. Children living in neighbourhoods with the highest traffic volumes had close to ten times the risk of pedestrian injury. There was a dose response relationship with a steady increase in the magnitude of the risk as traffic volume increased. Vehicle speed was also a strong risk factor for child pedestrian injury and may be particularly important in residential streets. Having a street with a mean vehicle



speed of over 40 kph within 500 metres of the home increased the risk of child pedestrian injury six fold.

A high density of on street parking was associated with a fourfold increase in risk of pedestrian injury. Children from homes without a fenced play area were at a significantly increased risk of pedestrian injury, although the prevalence of this risk factor in the Auckland population was very low. Children from homes where the play area was unfenced were at a significantly increased risk of injury, close to twice the risk of children from homes where the play area was fenced. For driveway related pedestrian injuries, children from homes where there is no fence separating the driveway from the play area had twice the risk of injury.

The Auckland Child Pedestrian Injury Study has provided, for the first time, information on the aetiology of child pedestrian injury in a large population based sample in New Zealand. In addition the study has provided the opportunity to examine a number of methodological issues in this comparatively new sphere of epidemiologic inquiry.

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