

CRIME, VIOLENCE AND INJURY
PREVENTION IN SOUTH AFRICA:
DATA TO ACTION



**CRIME, VIOLENCE AND
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DATA TO ACTION**

**Ashley Van Niekerk, Shahnaaz Suffla, Mohamed Seedat
(Editors)**



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**ASSESSING THE PREVENTION RESPONSE
TO CHILD ROAD TRAFFIC INJURIES**

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ABSTRACT

In 2000, road traffic fatality rates among children in South Africa were estimated to be double the world rate. This was mainly as a result of the large number of pedestrian deaths, which accounted for 77% of child road traffic fatalities. In this chapter we assess our response to the challenge of road traffic injuries among children in South Africa. We also discuss some of the prevention strategies that could be adopted using the public health approach as a methodological framework. Current data have revealed that pedestrians accounted for the bulk of child road traffic injuries, followed by motor vehicle passengers and cyclists. Most fatalities occurred in the 5–9 year and 15–19 year age groups, and male children were more at risk than females across all age groups.

Key-words: child, traffic, injuries

INTRODUCTION

In South Africa, the National Injury Mortality Surveillance System (NIMSS) revealed that in 2003, 28.4% of all injury deaths were the result of road traffic injuries. Children were particularly vulnerable road users, with 17% of all pedestrian and passenger fatalities occurring among children and young adults below the age of 20 years (Harris, Sukhai & Matzopoulos 2004). Among children aged 1–14 years, motor vehicle pedestrian collisions were the largest single cause of injury-related death, whilst for children aged 10–19, passenger deaths were the second largest cause (Harris, Sukhai & Matzopoulos 2004). In 2000, more than 4 000 children younger than 20 years lost their lives on South Africa's roads and road traffic fatality rates among children were estimated to be double the world rate (Matzopoulos,

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Norman & Bradshaw 2004). In 1998, approximately 11 000 children under injured (Road Accident Fund 2002). This was mainly as a result of the large number of pedestrian deaths, which accounted for 77% of child road traffic fatalities, compared to motor vehicle passenger and cycling deaths, which accounted for 20% and 3% respectively. The need to address child road traffic safety will become even more urgent, since road traffic injuries are set to increase by as much as 80% between 2000 and 2020 in sub-Saharan Africa (Kopits & Cropper 2003).

In this chapter, we assess the South African response to the challenge of child road traffic injuries and discuss some of the prevention strategies that could be adopted. We use the public health approach as a methodological framework. This approach stipulates that injuries are predictable rather than random events. It should be noted that the treatment of injuries has traditionally been the preserve of emergency medicine and curative services, but this addresses only one of the major sources of fatal and severe injury crashes, namely reducing the consequence of injury post collision.

Other measures to mitigate the severity and consequences of injury can be achieved by reducing exposure to risk, preventing crashes from occurring and reducing the severity of an injury in the event of a crash (Peden *et al.* 2004). Interventions typically utilise a combination of three strategies, known as the three "E's" of injury control: education (awareness campaigns and training), enforcement (legislation and policing) and engineering (including the road environment and vehicle design).

In the first section, we review current South African child road traffic injury data from NIMSS and the Red Cross War Memorial Children's Hospital (hereafter the hospital) in Cape Town in order to identify child road traffic injury priorities. The second section identifies several good practice strategies that are described in the international literature, many of which are cited in the *World Report on Traffic Injury Prevention* (Peden *et al.* 2004). In the final section we discuss some of the child safety initiatives currently underway in South Africa in order to identify strategic gaps and possible areas for improvement.

CURRENT DATA ON CHILD ROAD TRAFFIC INJURIES IN SOUTH AFRICA

The starting point for any effective prevention strategy is the collection of accurate and reliable information about specific injury events. Although the National Traffic Information System (eNaTIS) is the most detailed source of traffic collision data in South Africa and has played a major part in directing

the Department of Transport's (DoT) road safety strategy, it was not available to the public at the time of writing this chapter.² Therefore, we have had to restrict our analysis to three other data sources:

- NIMSS data from selected state mortuaries
- database of the Child Accident Prevention Foundation of South Africa (CAPFSA) from patients presenting to the trauma unit of the hospital
- road accident statistics for 1999 published by the DoT (DoT n.d.).

THE NATIONAL INJURY MORTALITY SURVEILLANCE SYSTEM (NIMSS)

NIMSS produces and disseminates descriptive epidemiological information from medico-legal post-mortem investigations and collates information from three points in the investigative procedure, namely post-mortem reports, SAP 180 forms and chemical pathology laboratory results (Butchart *et al.* 2001). In 2003, NIMSS recorded 24 600 non-natural deaths mainly from urban mortuaries and maintained full coverage in six major cities: Cape Town, Durban, East London, Port Elizabeth, and Pretoria/Tshwane (Matzopoulos, Norman & Bradshaw 2004).

Child road traffic injuries among children aged 0–19 years accounted for approximately one fifth of all pedestrian and passenger deaths. Motor-vehicle pedestrian collisions accounted for more child deaths in the 1–4, 5–9 and 10–14 year age groups than any other cause (see Table 1).

Table 1. Leading external causes of death from injuries among children < 19 years, 2003

Rank	Age groups (years)					Overall ranking*
	< 1	1–4	5–9	10–14	15–19	
1	Burns	Pedestrian	Pedestrian	Pedestrian	Firearm	Firearm
2	Abandon, baby	Drowning	Drowning	Firearms	Sharp	Pedestrian
3	Suffocation	Burns	Burns	Burns	Pedestrian	Sharp
4	Blunt	Passenger	Passenger	Passenger	Blunt	Burns
5	Pedestrian	Traffic unspecified	Traffic unspecified	Drowning	Hanging	Drowning

(Source: Harris, Sukhai & Matzopoulos 2004)

²The National Traffic Information System (eNaTIS) is available on: <http://www.natits.com>.

Child road traffic deaths have a greater level of priority for Black and Coloured's South Africans, as children younger than 20 years accounted for between 16% and 17% of road traffic deaths in these population groups, significantly higher ($p < 0.01$) compared to approximately 12% among Asians and Whites. Overall, males accounted for 61.3% of all child road traffic deaths with a male to female ratio of 1.6:1 (see Figure 1). The largest male to female ratio was among the 15-19 year age group (2.2:1) and the smallest was among the 10-14 year age group (1.2:1).

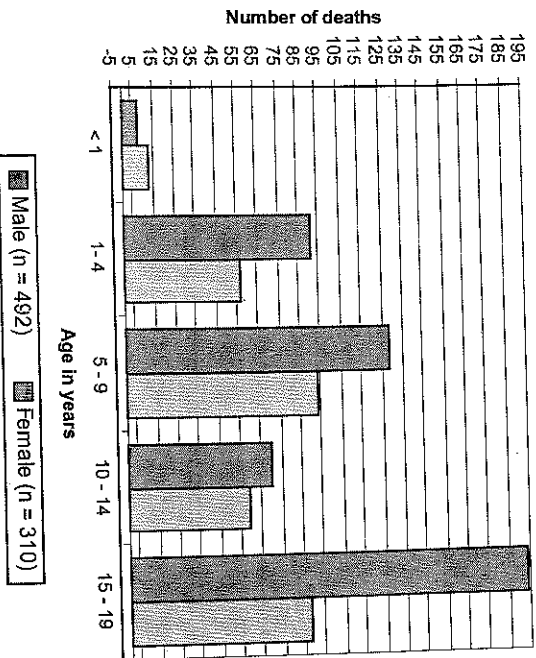


Figure 1. Age and gender of childhood traffic death, NIMSS 2003

More than one third of child road traffic deaths (37%) occurred over weekends (see Figure 2).

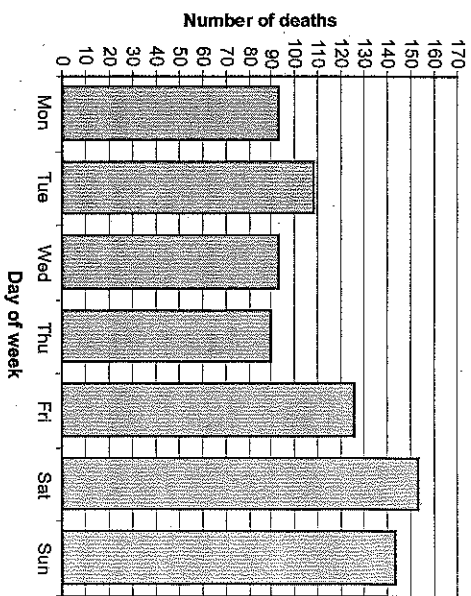


Figure 2. Day of childhood traffic death, NIMSS 2003 (n = 806)

More child road traffic deaths occurred on Saturdays than any other day, but this was mainly due to the large number of deaths in the 15-19 year age group (67). The 5-9 and 10-14 year age groups recorded the highest number of deaths on Fridays (40 and 25 deaths respectively). In the 5-9 year age group there were noticeable peaks at the times when children were travelling to and, especially from, school (see Figure 3).

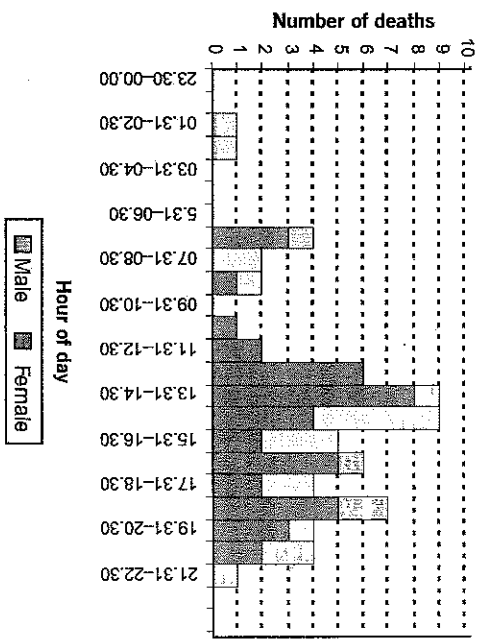


Figure 3. Pedestrian deaths 5-9 years by time of death and sex, NIMSS 2003 (n = 68)

¹The concept of "population group" or "race" and its constituents, i.e. "Asian", "Black", "Coloured" and "White" are social constructs and are not meant to signify any inherent genetic or biological differences between these groups. Instead, they are used as demographic markers where such profiling allows for identifying vulnerable populations in order to plan and implement effective prevention and intervention programmes

Road traffic fatalities among children younger than 20 years were not uniformly distributed across the four cities where NIMSS had full coverage (see Figure 4). In Tshwane and Johannesburg, road traffic fatalities peaked in March; whereas in Cape Town and Durban, the peaks were in January and June respectively.

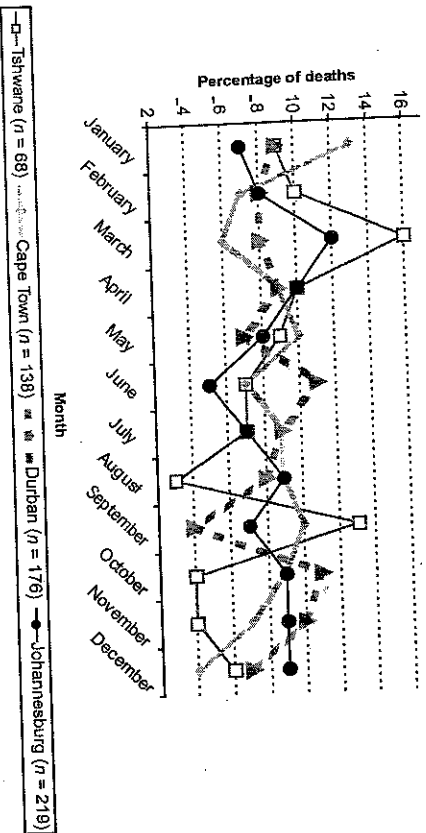


Figure 4. Injuries by month of death among children aged 0-19 years

CHILD ACCIDENT PREVENTION FOUNDATION OF SOUTH AFRICA (CAPFSA) DATABASE

CAPFSA keeps a database of all injured patients presenting to the trauma unit of the hospital. This hospital serves the greater Cape Town area and treats all children younger than 13 years seeking medical attention in the state sector.

From 1992 to 2000, 8 273 children presented to the trauma unit as the result of road traffic injuries sustained as pedestrians (65%), 2 327 (18%) as passengers and 1932 (15%) as cyclists. Between 1999 and 2000, pedestrian injuries accounted for approximately half of all children between the ages of 5-9 years who were treated at the hospital. Whereas cyclist and passenger injuries were distributed throughout the city, the bulk of the pedestrian injuries that presented were from the former townships of Langa, Nyanga, Khayelitsha, Atlantis and Gugulethu.

Figure 5 shows trends in the number of pedestrian injuries seen at the hospital annually. The numbers increased steadily until 1997 when there was a sharp drop in the incidence of pedestrian injuries, which can be attributed to the new Western Cape referral system that saw children with less severe injuries being treated at the primary level.

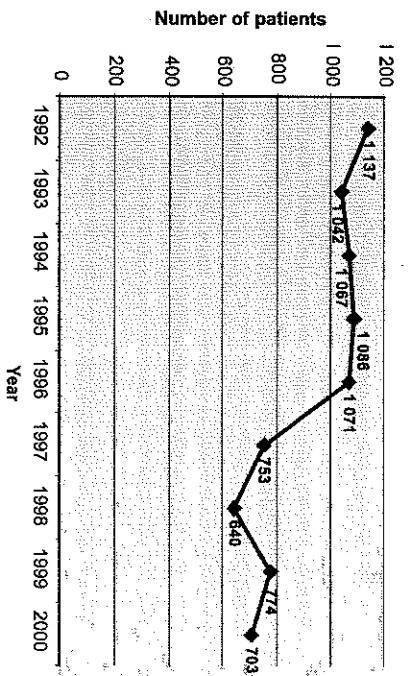


Figure 5. Pedestrian injuries treated at Red Cross War Memorial Children's Hospital, 1992-2000

Although a similar percentage of pedestrian and passenger fatalities were fatal (0.4% versus 0.3% respectively), 28% of pedestrians recorded moderate to severe injuries, which was significantly higher ($p < 0.01$) than the 21% of passengers and cyclists who were moderately to severely injured.⁴ No cyclist deaths were recorded. CAPFSA data also revealed that only 1 out of 5 child passengers who presented to the hospital were wearing suitable child restraints.

DEPARTMENT OF TRANSPORT ROAD ACCIDENT STATISTICS FOR 1999

The DoT runs two surveillance systems that record fatal crashes, namely eNaTIS, which is a comprehensive system that records details of all collisions whether or not they result in injuries, and Arrive Alive's National Fatal Accident Information Centre, which compiles fatal crash statistics for rapid dissemination during the Easter and Christmas vacation periods although the data collection takes place all year round. Despite indications that these surveillance systems may under report traffic crashes by as much as 30% (DoT 2003), eNaTIS statistics include detailed information about the circumstances of crashes that are useful for informing prevention.

Unfortunately, the 1999 injury statistics did not include cyclist injuries, and the passenger statistics were limited to a description of severity. A total of 475 child passengers younger than 20 years were fatally injured in 1999, and there were 17 "slight" and 4 severe injuries for each fatality.

⁴The CAPFSA database uses the Abbreviated Injury Score (AIS).

Surprisingly, only 417 pedestrian deaths were recorded in this age category, with 6.5 "slight" and 3.8 severe injuries for each fatality, indicating that the level of severity for pedestrian injuries was higher than for passengers. The total number of fatalities was fewer than the 437 recorded by NIMSS in 2003 from mortuaries representing less than half the national mortality caseload, and it seems that much of eNaTIS under-reporting may be due to the poor capture rate for pedestrian injuries.

The eNaTIS data did describe some important contributing factors for pedestrian injuries that may inform prevention initiatives. More severe and fatal injuries were most common on Fridays, Saturdays and Sundays, but "slight" injuries were more evenly distributed during the week, which may correspond with higher intoxication levels among drivers on weekends. More pedestrians were injured while walking with their backs to the traffic than while walking facing traffic.

INTERPRETATION OF FINDINGS

The analysis indicates that among children, the reduction of motor vehicle pedestrian collisions should be our most important priority and children in the 5-9 year age group warrant special attention. Young children simply do not possess all of the skills and attributes necessary to survive in traffic. They are at a physical disadvantage because of their height and immature visual and hearing ability and also have many limitations on a cognitive level, including a poor attention span; an imprecise perception of speed, distance, movement and direction; impulsiveness and unpredictability and a limited understanding of abstract concepts such as "safe" and "dangerous". The preponderance of pedestrian injuries may also have its roots in South Africa's urban design. Historically, the country's racially segregated cities saw infrastructure concentrated in the urban centre with millions of relatively poor city dwellers living in townships on the urban periphery often 10-20km removed from their daily activities. The rapid expansion of this peri-urban population following the relaxation of apartheid "influx control" laws has contributed to an increase in the use of motorised transport, especially minibus taxis and privately owned cars. As these developments were not well planned, there are currently few safe transport corridors between townships and city centres to accommodate all road users, including pedestrians and cyclists. The risk of traffic collisions may have been exacerbated by the many immigrants from rural areas who are not familiar with the urban roads and high-density traffic.

The analysis also shows that child passengers account for a considerable number of preventable injuries, especially as child restraints are under

utilised, and cyclist deaths should not be ignored, especially in light of the recent DOT initiatives to promote cycling among learners and women (DOT 2005). It is clear, however, that child traffic injuries follow different patterns in different cities and that prevention activities should be informed by reliable data collection at the city level. This will assist local authorities and prevention agencies in directing safety initiatives at the most needy neighbourhoods and at the most appropriate times.

CHILD TRAFFIC INJURY PRIORITIES AND EXAMPLES OF EFFECTIVE INTERVENTION STRATEGIES

Whereas for passenger and cyclist deaths there are several well established safety intervention practices, namely child seats (or seatbelts) and cycle helmets, the factors underlying pedestrian deaths are numerous and complex. Rivara (1990) has argued that no single intervention is completely effective and prevention should include pedestrian skills programmes, parent education, legislation, environmental modifications and vehicle changes at local, state and national levels.

Environmental modifications that take into account the different needs of pedestrians, cyclists and motorists, and speed reduction are important strategies for reducing a pedestrian's exposure to risk as well as reducing the severity of an injury in the event of a crash. Speed reduction can be achieved through traffic calming and lowering speed limits in areas with higher volumes of pedestrian and cyclist traffic. However, traffic calming through road design is preferable, as it is not reliant on enforcement by police and traffic officials or responsible driver behaviour. This is supported by several studies in the international academic literature. An Australian study which examined child pedestrian injury rates indicated that environmental changes may well affect traffic flow and reduce pedestrian risks, as child pedestrian injuries tend to occur in situations of high traffic flow where large numbers of vehicles exceed speed limits, particularly on residential roads (Dunn *et al.* 1994). Several studies (Dunn *et al.* 1994; Duperrax, Burnn & Roberts 2003), indicated limits to the effectiveness of child educational programmes. Traffic-calming devices such as speed humps, speed restrictions and road narrowing appear to be more effective ways of controlling injury rates. There is also evidence that countries placing a stronger emphasis on environmental change to control traffic flow have experienced greater reductions in child pedestrian injury and mortality rates (Kidsafe 1995).

Safer modes of transport are also an important means of reducing exposure to risk, as road usage puts people at greater risk per kilometre travelled than other modes of transport (Koonstra 2003; Miller et al. 1999). Among road users, drivers and passengers are 10 times more likely to be killed for each kilometre travelled than passengers in high occupancy vehicles (Koonstra 2003). Prioritising public transport means that not only are occupants exposed to less risk, but pedestrians and cyclists also benefit from the resulting decrease in traffic volumes. Other strategies to reduce the risk of exposure include better land use to reduce the distances that people travel (e.g. high density housing with easy access to schools and amenities) and safety impact assessments as part of land use planning (Peden et al. 2004).

For crash prevention, increased pedestrian and motor vehicle visibility are priorities. Again, speed reduction not only affords drivers more time to see pedestrians, but also allows them more time to take evasive action. Wider sidewalks, wider road shoulders and intersections with unencumbered visibility are examples of appropriate road design interventions to increase pedestrian visibility. Reflective clothing has also been advocated, but evidence remains inconclusive especially as it is difficult to ensure pedestrians' adherence. Legislation for mandatory use of lights by cars improves their visibility for all road users and has been proven as an effective intervention for crash reduction in a number of settings (Farmer & Williams 2002; Hollo 1998; Koonstra, Bijleveld & Hagenzieker 1997). In order to reduce the severity of an injury in the event of a crash, creating safer car fronts is an important strategy for improving pedestrian safety (Bly 1990; Crandall, Bhalla & Madely 2002; EEVSC 1994; Pritz 1984). Research should also be conducted to accurately assess the relative impacts of high-fronted vehicles (e.g. trucks, buses and sports-utility vehicles) on child pedestrians, as well as vehicles fitted with bull-bars.

It should be emphasised that several studies have shown that educational programmes have had limited success when applied in isolation and the question arises as to whether road safety education is wasted on young children. Nevertheless, programmes for alerting children to traffic safety may have some long-term utility in raising and improving their safety awareness. The situation may well be similar to the education of parents and drivers in the creation of a safer environment: while it may not significantly influence the immediate safety of young children, it does at least lay down the foundation for future safe behaviour on the road.

REVIEW OF CURRENT SOUTH AFRICAN INJURY PREVENTION INITIATIVES AIMED AT CHILDREN

A preliminary review of the child pedestrian safety sector reveals several measures to protect children in the traffic environment. Some of the stakeholder groups and initiatives relating to child road safety, include (but are not limited to):

- the DoT's Arrive Alive campaign
- research agencies such as the University of Natal Interdisciplinary Accident Research Centre (UNNARC); the Council for Scientific and Industrial Research (CSIR); the MRC-UNISA Crime, Violence and Injury Lead Programme (CVILP); and the North-West University Faculty of Education Sciences
- non-profit organisations such as Drive Alive, Soul City, Centre for Education in Traffic Safety and CAPFSA, which are involved in public awareness campaigns and lobbying as well as community outreach projects
- international agencies and consortiums such as the Global Road Safety Partnership.

One of the overarching strategies is the *Road to Safety Strategy 2001-2005* (DoT 2001), which has identified six interlocking and overlapping focal areas requiring intervention with the ultimate aim of reducing traffic collisions:

1. Road environment quality
2. Driver fitness
3. Vehicle fitness
4. Pedestrian safety and fitness (safe road usage by pedestrians)
5. Reform of regulatory and monitoring institutions
6. Targeted communication campaigns to challenge public attitudes and behaviour supported by private sector sponsorship; practical road safety training in schools and tertiary institutions; community road safety forums and programmes.

The DoT also launched the Arrive Alive Road Safety Campaign as a short-term initiative in 1997, but its initial success ensured further expansion and continued funding. Despite early successes in raising awareness of traffic crashes, the strategies have more recently attracted negative publicity in light of South Africa's continued high rates of road deaths (Automobile Association 2005).

It is worth noting that the two strategies employed by the DoT that relate to child pedestrian safety are both aimed at changing pedestrian behaviour (i.e. safe road usage and practical training in schools). As discussed above,

education in isolation is not believed to be effective, and passive strategies should be favoured over strategies that require active participation from the target group. The first reason is that it is particularly difficult to effect behaviour change and the second is that children under the age of eight years, who are not able to judge the speed of approaching vehicles accurately, require adult supervision in traffic. Parents should be made aware of their children's limitations in handling traffic situations safely and that as primary role models their participation is essential to ensure the success of educational programmes.

Other agencies that have been involved in teaching road safety directly to children include, the Faculty of Education Sciences at North-West University, which conducted a schools-based programme, and Drive Alive, which advocates the wearing of reflective clothing by school-children.

The Centre for Education in Traffic Safety has developed a curriculum for Traffic Safety Education for the training of teachers and education students and offers several certificate courses and degrees with specialisation in traffic safety education. There are also several cross-sectoral collaborative ventures that encourage business, civil society and government to work towards the sustainable reduction of road traffic collisions. One example is the Global Road Safety Partnership South Africa, which established the School Pedestrian Visibility Project in Eldorado Park with Drive Alive, the CSIR and 3M. Another example is the Umlazi Safe Communities Project, a collaboration between BP South Africa, the DoT, UNIAARC and the Mangosuthu Technikon, which trains teachers to integrate road safety into the classroom and volunteers to promote road safety in the community. However, no evaluation reports were available for any of these programmes when this chapter was compiled.

The only evaluation report that we were able to access which described a local traffic safety education campaign related to the Soul Buddyz programme, a multi media "edutainment" vehicle for children aged 8–12 years that incorporated television, radio and life skills booklets. The traffic safety messages promoted reflective material and encouraged children younger than nine years to be accompanied by an adult or older sibling in traffic. Advocacy campaigns included a reflector campaign to increase visibility of children to motorists and the promotion of scholar patrols in primary schools. The evaluation, which was not limited to traffic safety, but included the entire Soul Buddyz educational campaign, established the popularity of the traffic safety component, but found it difficult to attribute specific behaviour changes to Soul Buddyz. For example, whereas nearly two thirds of children were aware of reflectorisation, less than 5% of children owned reflectors and less than 2% used their reflectors regularly (Soul City 2001).

It is clear that we are unlikely to achieve a substantial reduction in the number of child pedestrian injuries unless statutory road safety campaigns acknowledge and address the specific hazards to which children are exposed. Schools are well placed to promote traffic safety, but strategies that reduce the risk of exposure, for example the Department of Education's policy of providing transport for children living more than 5 km from school, are likely to yield more positive results. Engineering measures for calming traffic flow and creating a safe traffic environment should also be prioritised, with designated safe play areas for children and demarcated safe routes to and from schools. Pedestrian routes should take into account their preferred destinations and provide direct access (reducing the temptation for pedestrians to take shortcuts through traffic), as well as their safety – the risk of robbery and assault is frequently cited as a reason for overhead bridges being under utilised.

CONCLUSION

Although measures to reduce children's exposure to risk in South Africa have fallen short, the recent introduction of legislation for the mandatory wearing of helmets by cyclists is an attempt to reduce the severity of an injury in the event of a crash. However, mandatory use of child restraints in cars has not been legislated and is urgently required, as child passenger deaths are a more important priority. The situation in South Africa is complicated by the different modes of transport used by children. Whereas cars are fitted with seatbelts for older children, and car seats can be fitted for younger children, many children travel by taxi, by bus and, especially in rural areas, on the back of a "bakke".⁵ Nevertheless, legislation stipulating the mandatory use of child restraints should be introduced for private car owners – these could be made available at lower cost through subsidies and seat swap programmes – and research commissioned to develop a child passenger safety strategy that can accommodate the needs of all communities. The research should be conceptualised around the following four phases: 1) Problem definition; 2) Risk factor identification; 3) Development and testing of pilot prevention programmes; and 4) Implementation of interventions and ongoing measurement of effectiveness (Van Niekerk & Durcan 2004).

One reason offered for the reliance on active measures such as education, awareness campaigns and enforcement, in low- and middle-income countries, is the prohibitive costs of environmental modification. However, this does not take into account the relative effectiveness of the prevention strategies or the associated long-term costs. The application of sub-optimal prevention strategies means that injuries that might otherwise have been prevented impose a financial burden on the health system and the survivor/deceased and their next of kin.

⁵Car with open back/pick-up truck.

Active measures require ongoing budgetary allocations and long-term costs may be greater, especially if injury costs are taken into account.

Children's safety on the road is the responsibility of all adults, parents, caregivers, drivers and other road users. A new culture that accepts children as equals on the road needs to be instilled in order to afford children greater respect and priority from other road users as well as from the various agencies that are instrumental in enhancing traffic safety. Interagency partnerships should be fostered at all levels in order to pool expertise and develop a coordinated response to this challenge. It is comforting to know that some priority is given to this issue with the *Road to Safety Strategy 2001–2005* (Dot 2001), which includes a National Pedestrian Action Plan that proposes a variety of pedestrian safety education and hazardous location upgrade programmes. It remains to be seen whether these interventions will materialise and if child pedestrians will receive due attention.

The traditional approaches of education, legislation (active measures) and environmental modification (passive measures) in pursuit of reducing both collisions and injury severity, deserve critical appraisal. Unless this is done, we are at risk of committing precious funding and scarce human resources to inappropriate strategies, as far as the target population or the physical environment is concerned. A systemic review of the sector should be undertaken along the lines of the *World Report on Traffic Injury Prevention* (Peden *et al.*, 2004) that will document current strategies, compare these strategies with those that have been proven effective, highlight deficiencies and suggest alternatives and improvements. There is also an urgent need for a traffic injury focal point that can take on the responsibility for collating information, documenting prevention programmes (i.e. setting objectives and putting in place systems to monitor and evaluate outcomes) and also facilitating programmes across different departments and sectors; we all know that road safety is as dependent on other functions of government, such as urban planning and social welfare, as it is on transport, but not enough is being done for these to be included.

REFERENCES

- Automobile Association 2005, Press release issued by the Automobile Association of South Africa, 14 February.
- Bly, PH 1990, 'Vehicle engineering to protect vulnerable road users', *Journal of Traffic Medicine*, vol. 18, p. 244.
- Brown, PJ & Inhorn, M 1990, 'Disease, ecology and human behavior', in *Medical anthropology: handbook of theory and method*, ed. TM Johnson & CF Sargent, New York, Greenwood Press.
- Butchart, A, Peden, M, Matzopoulos, R, Phillips, R, Burrows, S, Bhagwandin, N, Saayman, G, Cooper, A & Participating Forensic Pathologists 2001, 'The South African national non-natural mortality surveillance system—rationale, pilot results and evaluation', *South African Medical Journal*, vol. 91, pp. 408–417.
- Conroy, C & Fowler, J 2000, 'The Haddon matrix: applying an epidemiologic research tool as a framework for death investigation', *American Journal of Forensic Medicine and Pathology*, vol. 21, no. 4, pp. 339–342.
- Crandall, JR, Bhalla, KS & Madely, J 2002, 'Designing road vehicles for pedestrian protection', *British Medical Journal*, vol. 324, pp. 1145–1148.
- Dot n.d., 1999 RSA accident statistics, viewed: 17 October 2005, <http://www.transport.gov.za/projects/arrive/1999/stats/accidents/contents.html>
- Dot 2001, *Road to safety strategy 2001–2005*.
- Dot 2005, Shova Kalula ("Ride Easy") bicycle programme, viewed: 25 June 2005, <http://www.transport.gov.za/projects/index.html>.
- Dot 2003, 'Road accident reports misleading', *Presentation to Parliament Portfolio Committee on Transport*, viewed: 17 October 2005, <http://www.transport.gov.za/projects/arrive/1999/stats/accidents/contents.html>.
- Dunn, R, Hassall, J, Lee-Joe, T, Norton, R & Roberts, I 1994, 'Environmental factors and child pedestrians injuries', *Australian Journal of Public Health*, vol. 18, no. 1, p. 90.
- Duperrex, O, Bunn, F & Roberts I 2003, 'Safety education for injury prevention', *The Cochrane Library*, issue 4, Wiley & Sons, Chichester.
- European Enhanced Vehicle Safety Committee (EEVSCO), Working Group 10 1994, *Proposals for methods to evaluate pedestrian protection for passenger cars*.
- Farmer, CM & Williams, AF 2002, 'Effects of daytime running lights on multiple-vehicle daylight crashes in the United States', *Accident Analysis and Prevention*, vol. 34, no. 2, pp. 197–203.
- Harris, C, Sukhai, A & Matzopoulos, R 2004, 'National fatal injury profile, in *A profile of fatal injuries in South Africa 2003: fifth annual report of the National Injury Mortality Surveillance System (NIMSS)*, ed. R Matzopoulos, MRC–UNISA CIVILP Technical Report, Tygerberg.

PEDESTRIAN INJURY IN SOUTH AFRICA FOCUSING INTERVENTION EFFORTS ON PRIORITY PEDESTRIAN GROUPS AND HAZARDOUS PLACES

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ABSTRACT

In South Africa, as in other low- to middle-income countries, pedestrians account for the major proportion of road traffic injuries (RTIs). In order to inform our responses to pedestrian injuries this chapter attempts to provide an overview of the human and environmental context within which pedestrian injuries occur and examines existing pedestrian safety efforts. More specifically, this chapter presents an analysis of pedestrian fatal injuries (2001–2004) and a review of current selected pedestrian safety efforts in South Africa. The interventions are reviewed against international benchmarks and analysed for local relevance and appropriateness. Analysis points to the need for re-defining target pedestrian groups for intervention and increased sensitivity for local specifics. Pedestrian safety measures must take cognisance of the local context of perceived and real crime, poverty and increased urbanisation and adopt a multidimensional approach. The immediate focus on educational interventions must widen to include engineering measures that recognise pedestrians as significant road users. Likewise this analysis suggests that interventions ought to address the pedestrian fatalities-alcohol nexus, at risk behaviours and at-risk environments.

Key-words: pedestrian injuries, pedestrian safety, prevention, South Africa

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- Hollo, P 1998, 'Changes in the legislation on the use of daytime running lights by motor vehicles and their effect on road safety in Hungary', *Accident Analysis and Prevention*, vol. 30, pp. 183–199.
- Kidsafe 1995, *The Magazine of the Child Accident Prevention Foundation of Australia*, Winter, pp. 21–22.
- Koornstra, MK (ed.) 2003, *Transport safety performance in the EU*, European Transport Safety Council, Transport Accident Statistics Working Party, Brussels, viewed: 17 November 2003, <http://www.etsc.be/rep.htm>.
- Koornstra, MK, Bijleveld, F & Hagenzieker, M 1997, *The safety effects of daytime running lights*, Report R-97-36, Institute for Road Safety Research, Leidschendam.
- Kopits, E & Cropper, M 2003, 'Traffic fatalities and economic growth', *Policy Research Working Paper Number 3035*, The World Bank, Washington DC.
- Matzopoulos, R, Bowman, B, Seedat, M & Sukhai A 2005, 'The National Injury Mortality Surveillance System', in *A profile of fatal injuries in South Africa 2003: fifth annual report of NIMSS*, ed. R Matzopoulos, MRC-UNISA CIVLP Technical Report, Tygerberg.
- Matzopoulos, R, Norman, R & Bradshaw, D 2004, 'The burden of injury in South Africa: fatal injury trends and international comparisons', in *Crime, violence and injury prevention in South Africa: developments and challenges*, ed. S Suffla, A van Niekerk & N Duncan, MRC-UNISA CIVLP, Tygerberg.
- Miller, T, Spicer, RS, Lestina, DC & Levy, DT 1999, 'Is it safest to travel by bicycle, car or big truck?', *Journal of Crash Prevention and Injury Control*, vol. 1, pp. 25–34.
- Peden, M, Scurfield, R, Sleet, D, Peden, M, Scurfield, R, Sleet, D, Mohan, D, Hyder, AA, Jarawan, J & Mathers, C (eds.) 2004, *World report on road traffic injury prevention*, World Health Organization, Geneva.
- Pritz, HB 1984, *Effects of hood and fender design on pedestrian head protection*, National Highway Traffic Safety Administration (NHTSA), Report no. DOT HS-806 537, NHTSA, Washington, DC.
- Rivara, FP 1990, 'Childhood pedestrian injuries in the United States', *American Journal of Diseases of Children*, vol. 144, pp. 692–696.
- Road Accident Fund 2002, 'Children as road accident victims', *Commission Report*, vol. 3, pp. 120–123, viewed: 17 October 2005, <http://www.transport.gov.za/library/docs/ra/fannexC-2.pdf>.
- Soul City 2001, *Soul Buddyz evaluation summary report*, Soul City, Johannesburg.
- van Niekerk, A & Duncan, N 2004, 'A new journal for the promotion of injury prevention in Africa', *African Safety Promotion: A Journal of Injury and Violence Prevention*, vol. 1, no.1, pp.1–4.