

Risk-taking behaviour of Cape Peninsula high-school students

Part VI. Road-related behaviour

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Abstract The prevalence of a wide range of risk-taking behaviour among high-school students in the Cape Peninsula, South Africa, was investigated. In this article, the findings for road-related behaviour are presented. Cluster sampling techniques produced a sample of 7 340 students from 16 schools in the three major education departments. A self-administered questionnaire was completed in a normal school period. Estimates for each education department were weighted to produce an overall estimate. During the previous year, 8,5% of the students had been involved in a motor vehicle accident, and 7,4% had been injured in a pedestrian accident. Of those who had driven a vehicle, 63,2% reported driving without a licence; 16,1% drove an overcrowded vehicle; and 8% reported driving under the influence of alcohol or cannabis. Of those who had been on a motorcycle, 47,9% reported riding without a helmet. Despite the availability of seat belts, 37,3% had failed to wear one on the last occasion they were in the front seat of a vehicle. Variations according to gender, standard, and home language(s) were identified. The prevalence of risk behaviour was higher in males, who also showed a more pronounced increase in such behaviour with age. The need for accident prevention programmes remains urgent.

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In both developed and developing countries unintentional injury is the leading cause of mortality and morbidity in adolescents and young adults.^{1,3} Indeed, in the 15 - 24-year age group more lives are lost through unintentional injury than all other causes combined.^{1,2}

For all ages, road-related accidents claim more lives than any other major external cause of death.⁴ In the USA, 40% of all deaths among people aged 16 - 22 years are due to motor vehicle accidents.⁴ In South Africa, the problem is of similar magnitude.⁴ Of the 56,8% of adolescent deaths that were due to external causes during the period 1984 - 1986, road accidents were the main cause of death for all population groups in the 10 - 14-year age group. Among adolescents aged 15 - 19 years, road accidents were the most common cause of death for whites and Asians, but were second to assault for the other population groups.³

Mortality data are, however, only the tip of the iceberg. Unpublished data from Cape Town's Groote Schuur Hospital Trauma Unit indicate that in 1991, each death due to road-related accidents was paralleled by 44 admissions and 77 patients treated on an ambulatory basis for road-related injuries. And although no deaths were recorded for the age group 13 - 19 years, there were 163 admissions and 391 outpatients. These figures reflect the international profile of disproportionately high injury rates among the adolescent population.^{1,3}

The success of environmentally based prevention efforts in European countries⁶ has done much to dispel the myth that 'accidents' are by definition the unavoidable result of random events. Accordingly, research has increasingly focused on identifying demographic and individual risk factors which increase the likelihood of becoming a 'victim' to unintentional injuries.^{1,2,7} Seen from this perspective, the high accident rate among adolescents may in part be ascribed to a variety of developmental and social factors associated with this life phase. These include experimentation, emotional instability, risk taking, inexperience and role expectation, as well as a generally greater exposure to high-risk activities such as drunken driving.^{1,2,8} It is therefore likely that a substantial proportion of road-related injuries are preceded by identifiable risk-taking behaviour. This possibility was investigated as part of a larger study on risk-taking behaviour among Cape Peninsula high-school students.⁹

Methods

The methodology of the larger study of which this work forms a part has been described in detail elsewhere.⁹ The study population was defined as all Cape Peninsula high-school students. Cluster sampling yielded a sample of 7 340 students from 16 schools in the three major education departments. A self-administered questionnaire was completed by each student under conditions approximating those of examinations. Means were weighted to account for the fact that different proportions of students were selected from each education department.

The questionnaire items dealing with road-related behaviour during the previous year included the following: (i) motor cycle riding and helmet use; (ii) motor vehicle accidents; (iii) pedestrian accidents; (iv) seat-belt use; (v) unlicensed driving; (vi) vehicle overcrowding; and (vii) driving while affected by alcohol or cannabis.

Results

Motorcycle riding and helmet use (Table I)

Of the total sample, 32,5% (95% confidence interval (CI) 28,5 - 36,4) had been on a motorcycle during the previous year and of these 47,9% (95% CI 44,2 - 51,6)

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reported riding without a helmet. For each standard and language group more males than females had ridden a motorcycle, but females used helmets more often. In comparison with the other language groups very few Xhosa-speaking students had been on a motorcycle.

TABLE I.
Percentage (with 95% CIs) of students who during the previous 12 months had ridden a motorcycle as a passenger or a driver (*N* = 7 340)* and who had ridden without a helmet (*N* = 1 941)†, by standard and home language(s), and gender

	Males	Females
Motorcycle riding		
Standard		
6	31,7 (27,3 - 36,0)	23,4 (18,8 - 28,1)
7	34,0 (30,3 - 37,7)	22,7 (18,9 - 26,5)
8	37,1 (30,4 - 43,9)	27,0 (20,8 - 33,3)
9	45,7 (38,9 - 52,4)	31,8 (25,3 - 38,4)
10	55,1 (48,4 - 61,7)	27,0 (22,6 - 31,3)
Language(s)		
Afrikaans	41,2 (36,7 - 45,7)	31,7 (27,6 - 35,8)
Afrikaans and English	40,0 (34,7 - 45,2)	27,4 (23,4 - 31,3)
English	46,7 (44,9 - 48,5)	27,3 (25,7 - 28,8)
Xhosa	4,4 (3,8 - 5,1)	4,0 (3,2 - 4,9)
Non-use of helmet		
Standard		
6	45,3 (38,3 - 52,3)	45,1 (39,0 - 51,3)
7	49,9 (43,6 - 56,2)	43,5 (38,0 - 49,0)
8	54,9 (48,3 - 61,5)	43,4 (36,5 - 50,4)
9	53,3 (42,1 - 64,6)	43,3 (33,9 - 52,7)
10	52,4 (44,9 - 60,0)	44,5 (35,7 - 53,4)
Language(s)		
Afrikaans	55,7 (51,8 - 59,7)	55,5 (51,4 - 59,7)
Afrikaans and English	51,6 (42,3 - 61,0)	36,1 (26,1 - 46,2)
English	52,7 (46,5 - 58,9)	45,3 (39,2 - 51,4)
Xhosa	20,3 (15,1 - 25,5)	19,7 (8,0 - 31,4)

* 63 missing responses.
† 104 missing responses.

Motor vehicle accidents (Table II)

Of the entire sample, 8,5% (95% CI 7,3 - 9,6) had been involved in an accident while travelling in a motor vehicle during the previous 12 months. Males showed a more marked increase with standard. The incidence was lowest among Xhosa-speaking students.

TABLE II.
Percentage (with 95% CIs) of students who during the past 12 months had been involved in an accident while travelling in a motor vehicle (excluding motorcycles), by standard and home language(s), and gender (*N* = 7 340)*

	Males	Females
Standard		
6	7,3 (5,5 - 9,0)	5,9 (5,0 - 6,9)
7	9,3 (7,5 - 11,0)	6,0 (4,6 - 7,4)
8	10,5 (8,0 - 13,0)	6,9 (4,8 - 8,9)
9	12,2 (9,8 - 14,7)	6,4 (4,6 - 8,3)
10	14,9 (12,8 - 17,0)	9,5 (6,8 - 12,1)
Language(s)		
Afrikaans	9,2 (7,8 - 10,6)	4,9 (4,1 - 5,6)
Afrikaans and English	11,6 (9,1 - 14,1)	9,0 (6,4 - 11,6)
English	13,6 (12,6 - 14,6)	9,0 (6,4 - 11,5)
Xhosa	4,4 (3,8 - 5,1)	4,0 (3,2 - 4,9)

*124 missing responses.

Pedestrian accidents (Table III)

As pedestrians of the total sample 7,4% (95% CI 6,1 - 8,7) reported that they had been injured as pedestrians by a motor vehicle, a motorcycle or a bicycle. There was a higher male-to-female incidence for each standard and language group. An inverse association was noted between reported pedestrian injuries and school standard. Xhosa females reported the lowest incidence of pedestrian injuries.

TABLE III.
Percentage (with 95% CIs) of students who during the past 12 months had been injured by a motor vehicle, motorcycle and bicycle while walking or stading, by standard and home language(s), and gender (*N* = 7 340)*

	Males	Females
Standards		
6	11,3 (9,0 - 13,6)	8,1 (6,4 - 9,9)
7	10,9 (8,4 - 13,4)	5,7 (4,1 - 7,3)
8	8,5 (6,8 - 10,3)	5,7 (4,0 - 7,3)
9	6,6 (4,3 - 8,8)	4,3 (3,1 - 5,6)
10	5,5 (1,7 - 9,3)	4,9 (2,9 - 6,9)
Language(s)		
Afrikaans	7,7 (6,4 - 9,0)	5,7 (4,2 - 7,2)
Afrikaans and English	9,9 (6,8 - 13,1)	5,8 (3,6 - 8,0)
English	10,4 (8,2 - 12,6)	7,0 (6,1 - 8,0)
Xhosa	8,8 (7,2 - 10,4)	3,4 (3,0 - 4,5)

*130 missing responses.

Risk behaviour related to the use of motor vehicles

Of the total sample, 95,1% (95% CI 93,8 - 96,3) had travelled in a motor vehicle during the previous year, and 32,1% (95% CI 28,8 - 35,4) reported personally driving a vehicle on a public road; 45,9% (95% CI 41,5 - 50,2) of males and 20,2% (95% CI 17,5 - 22,8) of females drove a vehicle on a public road.

Seat-belt use

Although 78,5% (95% CI 76,0 - 80,9) of students endorsed the safety value of seat belts, only 62,7% (95% CI 59,3 - 66,1) had actually worn a safety belt on the last occasion they had travelled in the front seat of a motor vehicle; 58,9% (95% CI 54,3 - 63,5) of males students and 66,0% (95% CI 63,0 - 68,9) of females had worn a safety belt.

Driving without a licence (Table IV)

Of the students who had travelled as a passenger in a motor vehicle, 29,8% (95% CI 28,3 - 31,3) had known or strongly suspected on the last occasion they had done so that the driver did not have a licence. For males there was a tendency for the percentage to increase with standard, whereas among females this trend was less apparent. Variation between the language groups was not marked.

Of those who had personally driven a motor vehicle on a public road, 63,2% (95% CI 58,1 - 68,2) had driven without a licence. Males were more likely to have done so, and the rates for both males and females increased up to Standard 9. The proportion of Xhosa-speaking students who had driven a vehicle without a licence was low in comparison with the other language groups.

TABLE IV.
Percentage (with 95% CIs) of students who had travelled as a passenger ($N = 6\ 875$)* or driver ($N = 2\ 116$)† in a motor vehicle in the previous 12 months, who either knew that the driver did not have a licence, or drove a vehicle without a licence; by standard and home language(s), and gender

	Males	Females
As passengers		
Standard		
6	26,3 (22,4 - 30,1)	24,2 (17,4 - 31,0)
7	25,5 (21,1 - 29,9)	25,8 (22,8 - 28,8)
8	33,1 (27,5 - 38,8)	23,6 (21,2 - 26,0)
9	40,7 (34,1 - 47,4)	28,4 (24,9 - 31,9)
10	48,1 (43,1 - 53,1)	31,0 (26,8 - 35,2)
Language(s)		
Afrikaans	33,8 (31,8 - 35,8)	25,6 (22,5 - 28,8)
Afrikaans and English	33,8 (28,3 - 39,3)	24,8 (19,7 - 29,9)
English	32,2 (29,5 - 35,0)	23,4 (20,1 - 26,7)
Xhosa	35,9 (33,6 - 38,3)	37,2 (33,8 - 40,6)
As drivers		
Standards		
6	56,3 (50,0 - 62,7)	35,1 (27,2 - 43,1)
7	69,3 (61,7 - 76,9)	50,4 (39,7 - 61,0)
8	76,6 (71,3 - 81,8)	58,7 (51,5 - 66,0)
9	78,6 (73,2 - 84,0)	69,7 (62,6 - 76,8)
10	62,0 (57,3 - 66,7)	48,3 (38,8 - 57,7)
Language(s)		
Afrikaans	72,5 (66,0 - 79,0)	57,9 (54,8 - 61,0)
Afrikaans and English	71,9 (65,7 - 78,1)	56,7 (46,9 - 66,4)
English	67,0 (63,0 - 70,9)	52,0 (47,3 - 56,7)
Xhosa	45,8 (36,4 - 55,3)	22,7 (14,9 - 30,4)

*215 missing responses.
† 51 missing responses.

Vehicle overcrowding (Table V)

Among those in the sample who had travelled in a motor vehicle as a passenger, 41,7% (95% CI 39,0 - 44,4) believed that the vehicle had been overcrowded. There were no major variations with respect to gender or language. Incidence for both male and female passengers increased with standard.

Of the students who had personally driven a motor vehicle, 16,1% (95% CI 15,1 - 17,1) reported that the vehicle had been overcrowded. In contrast to the previous finding, the incidence did not increase with standard for males and females. Both male and female Xhosa students reported driving an overcrowded vehicle more often than the other language groups.

Alcohol and cannabis (Table VI)

As passengers 14,5% (95% CI 12,3 - 16,7) reported having travelled in a vehicle the driver of which was affected either by alcohol or cannabis. Differences between the genders were small, and the main trend was an upward gradient with standard.

Among those who had driven a vehicle during the previous year, 8% (95% CI 6,3 - 9,7) reported having done so while affected by alcohol or cannabis. No consistent trends were noted between the different standard, gender and language groups. The proportion of students in lower standards who had driven while under the influence of alcohol or cannabis was as large in the higher standards.

TABLE V.
Percentage (with 95% CIs) of students who had travelled in a motor vehicle during the past 12 months as a passenger ($N = 6\ 875$)* or a driver ($N = 2\ 116$)†, who knew that the vehicle was overcrowded; by standard and home language(s), and gender

	Males	Females
As passengers		
Standard		
6	31,2 (26,3 - 36,1)	32,9 (28,0 - 37,8)
7	38,1 (32,0 - 44,3)	38,4 (36,1 - 40,7)
8	41,9 (35,9 - 47,9)	45,4 (39,9 - 50,9)
9	46,7 (41,5 - 52,0)	47,7 (43,0 - 52,3)
10	52,7 (49,3 - 56,1)	50,7 (46,8 - 54,7)
Language(s)		
Afrikaans	39,8 (36,8 - 42,8)	40,3 (35,9 - 44,8)
Afrikaans and English	43,5 (39,0 - 48,0)	43,3 (38,9 - 47,8)
English	42,0 (39,9 - 44,0)	44,9 (43,0 - 46,8)
Xhosa	38,2 (34,2 - 42,3)	42,9 (38,3 - 47,5)
As driver		
Standard		
6	16,1 (10,2 - 22,0)	23,5 (14,1 - 33,0)
7	17,0 (14,7 - 19,2)	20,8 (13,4 - 28,1)
8	11,9 (8,4 - 15,7)	15,8 (10,4 - 21,3)
9	15,5 (12,5 - 18,6)	10,9 (7,2 - 14,6)
10	17,9 (13,0 - 22,8)	7,6 (4,6 - 10,6)
Language(s)		
Afrikaans	16,6 (12,8 - 20,4)	13,8 (10,2 - 17,2)
Afrikaans and English	16,6 (13,5 - 19,8)	17,4 (13,5 - 21,3)
English	11,2 (9,8 - 12,5)	15,8 (13,5 - 18,0)
Xhosa	32,2 (30,7 - 33,7)	20,0 (13,5 - 26,6)

* 90 missing responses.
† 39 missing responses.

TABLE VI.
Percentage (with 95% CIs) of students who had travelled in a motor vehicle in the previous 12 months as a passenger ($N = 6\ 875$)* or driver ($N = 2\ 116$)†, who either knew that the driver was affected by alcohol or cannabis, or themselves drove under the influence of alcohol or cannabis; by standard and home language(s), and gender

	Males	Females
As passengers		
Standard		
6	9,7 (6,7 - 12,7)	10,3 (6,8 - 13,8)
7	10,6 (8,5 - 12,6)	11,0 (8,2 - 13,8)
8	16,9 (11,4 - 22,4)	12,6 (9,3 - 16,0)
9	19,6 (13,2 - 25,9)	16,3 (10,1 - 22,6)
10	22,6 (19,1 - 26,2)	20,8 (16,8 - 24,7)
Language(s)		
Afrikaans	13,4 (11,0 - 15,8)	12,4 (9,6 - 15,2)
Afrikaans and English	15,0 (10,8 - 19,3)	13,6 (10,0 - 17,2)
English	18,4 (15,9 - 21,0)	15,9 (14,8 - 17,0)
Xhosa	15,6 (12,1 - 19,2)	14,4 (11,1 - 17,7)
As drivers		
Standard		
6	8,7 (6,9 - 10,5)	7,8 (2,7 - 13,0)
7	7,7 (4,3 - 11,1)	9,2 (2,5 - 15,9)
8	8,7 (4,6 - 12,9)	7,8 (3,8 - 11,9)
9	6,4 (4,0 - 8,8)	5,2 (1,8 - 8,5)
10	10,2 (6,9 - 13,2)	6,7 (2,8 - 10,5)
Language(s)		
Afrikaans	9,1 (5,2 - 13,0)	3,5 (1,7 - 5,4)
Afrikaans and English	8,6 (5,7 - 11,4)	9,0 (3,7 - 14,4)
English	7,2 (5,1 - 9,3)	9,8 (8,1 - 11,5)
Xhosa	10,2 (5,5 - 14,9)	8,4 (0,0 - 16,9)

* 189 missing responses.
† 72 missing responses.

Discussion

Internationally, road-related death rates vary by gender, age, race and socio-economic status.¹ The findings of this study are generally in keeping with these trends. They show that males are overall at greatest risk for road-related accidents, the extent of this predominance being mediated by the nature of the accident. With the exception of pedestrian accidents, vulnerability increases with age and this tends to be most marked among males. Among the language groups Xhosa-speaking students, females in particular, seem less susceptible to road-related injury. No obvious variations appear to exist between the other language groups.

It can be misleading, however, to discuss road-related accidents as if all were similar events.⁴ To assess their overall significance for the prioritising of interventions each area of behaviour needs to be separately contextualised.

Following the international trend,^{4,6} younger adolescent males are more likely to be involved in pedestrian accidents. Similarly, in a local study of Cape Peninsula children¹⁰ it was found that the incidence of pedestrian injuries tends to decline after the age of 9 years. The fact that pedestrian deaths generally account for the second-largest category of road-related deaths⁴ affirms the importance of prevention programmes in this terrain. In several European countries successful attempts have been made to improve the safety of pedestrians by environment modifications.⁶ In South Africa, however, much remains to be done about ensuring adequately designed sidewalks, lighting and sufficient playgrounds for children. This applies to poorer communities in particular.

Besides those adolescents who rode a motorcycle without a helmet, the fact that a third of the population had been on a motorcycle at all during the past year may be a matter of concern. In the USA, for example, two-thirds of all motorcycle deaths occur in the 15 - 24-year age group.² Not only has the mortality rate for motorcyclists been found to be 5 - 15 times higher than for drivers and passengers involved in motor vehicle accidents,^{4,11} any injuries sustained are comparatively more severe in motorcycle accidents.¹¹ And although mandatory helmet use reduces the number of fatal injuries considerably,¹² the dangers remain exceedingly high.

Injuries to passenger vehicle occupants are the prime cause of motor vehicle accident fatalities. In the USA, among males aged 15 - 19 years, one-third of all deaths are due to injuries sustained as motor vehicle occupants.⁵ Similarly, in the Groote Schuur Hospital Trauma Unit more than half of the road-related injuries among adolescents aged 13 - 19 years in 1991 involved vehicle occupants. It is disturbing, therefore, that a sizeable proportion (8,5%) of adolescents, predominantly older males, report being involved in motor vehicle accidents. Whether the accidents reported on are minor or not, it has been shown elsewhere that adolescents who have a history of vehicle accidents are more likely to be fatally injured later in life.² It is also likely that alcohol intoxication contributed to the accidents reported on in this study, since the relationship between alcohol and motor vehicle accidents has been demonstrated repeatedly.^{2,3} The dangers for both driver and passengers are compounded when the vehicle is overcrowded and the driver inexperienced and intoxicated.

In all the above types of road-related risk-taking behaviour the higher rates among males are not only due to differences in exposure to risky activities. Innate sex differences as well as societal role expectations are likely to play a role in the noted variations between the gender, since it is observed that despite controlling for

exposure males remain at higher risk.¹⁴ For example, although males travel more distance in motor vehicles than females, they also have higher death rates per kilometre travelled.⁴

Exposure may account for the finding that road-related risk taking increases with age. The patterns of pedestrian injury in this study show that specific categories of road-related behaviour are also mediated by age.⁴ Besides greater levels of exposure, the international concentration of motor vehicles injuries among 15 - 24-year-olds² has been attributed to such individual characteristics as inexperience, risk-taking as drivers of motor vehicles, and little experience with and poor judgement regarding the use of alcohol and drugs.²

Socio-economic variables are known to have significant influence on mortality rates due to external causes.^{3,10} The most likely explanation for the relatively low proportion of Xhosa-speaking adolescents who appear to engage in high-risk road-related behaviour is therefore the historically embedded economic inequity in South Africa. One consequence of their restricted access to the material commodities of an urban society is that Xhosa-speaking adolescents seem to be exposed less frequently to situations involving road-related risks. This does not, however, imply that they are less vulnerable to all physical injury, since socio-economic factors are associated with an increase in intentional injuries. The rate of death and injury arising from assault, for example, is far higher among the black population.^{5,14} In the light of sweeping political changes and the staggering pace of urbanisation¹⁵ this scenario is expected to change in the years ahead. Xhosa-speaking students are likely to become increasingly vulnerable to road-related injuries and should therefore be included in any preventive programmes.

The discrepancy between knowledge and behaviour in safety-belt use highlights the difficulty of attempting to modify adolescent behaviour through awareness education. Despite endorsing the effectiveness of seat belts and despite the possible legal repercussions associated with their non-use, more than a third of Peninsula adolescents do not appear to wear them regularly. The group possibly most at risk for road-related accidents is thus least amenable to educational approaches.⁴ In light of the limited effectiveness of educationally based safety campaigns in general,^{1,2,16,17} increased priority should be focused on measures that do not rely on personal responsibility. An example of such a measure would be legislation compelling vehicle manufacturers to fit air bags in their cars, thereby protecting the occupant automatically from the full effects of a collision.^{1,2} Internationally, these measures are generally proving far more effective than educational approaches aimed at changing individual attitudes and behaviour.^{1,2,6,16}

Although the causation of injury involves a complex interaction between individual, agent of injury and environment,¹⁸ most adolescent death and injury is potentially preventable. Despite the absence of longitudinal data the profile of patterns discerned in this study endorses the contributory role of behavioural and developmental antecedents in adolescent injury. Bearing in mind that adolescence inevitably involves a certain amount of physical risk taking, a major challenge is to devise strategies that facilitate the safe expression of these crucial developmental imperatives.

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