

Violence and injury mortality in the Cape Town metropole

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Objective. To describe accurately the violence and injury mortality in a South African city and demonstrate the utility of secondary data sources to identify injury control priorities

Design. Cross-sectional analysis of medicolegal laboratory (state mortuary), forensic and police data.

Setting. Metropolitan Cape Town, 1994.

Results. Non-natural causes (deaths due to homicide, suicide, accidents and undetermined causes) accounted for almost 4 000 deaths, which comprised approximately 30% of all-cause mortality during 1994. The five main violence and injury mortality categories were: homicide (1 789 cases; 46% of all non-natural mortality), transport accidents (1 130 cases; 29% of all non-natural mortality), fire (295 deaths; 8% of all non-natural mortality), suicide (291 deaths; 7% of all non-natural mortality) and drowning (96 cases; 2% of all non-natural mortality).

Conclusions. Priority issues in injury control include the increasing homicidal and suicidal use of firearms, road and rail commuter injury and the spatial distribution of injury. Surveillance, based on non-natural mortality, should be included in local, regional and national health information systems.

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In South Africa, homicide, suicide and transport accidents contribute substantially to the burden of disease, especially among the poor and disadvantaged.¹ The quality of national mortality data is a source of concern²⁻⁴ and estimates of the number of deaths due to 'undetermined causes' vary from 32% to approximately 60%.^{5,6}

Good-quality mortality data are regarded as fundamental to health resource allocation decisions, especially in the presence of substantial disparities in health indicators between various groups.⁷ In this context, cities such as Cape Town have significant differences in health status between suburbs, and qualitative review of mortality data reveals the effects of poverty and deprivation.^{8,9} While little work has been undertaken on intra-urban differentials in violence and injury incidence, earlier research has focused on differences in infant mortality rates between various

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suburbs of Cape Town.¹⁰⁻¹² This article aims to provide an accurate cross-sectional perspective on a single year's mortality from violence and injury in South Africa's second-largest city. It is hoped that this will stimulate interest in mortality surveillance in other parts of the country and raise awareness of injury control as a health priority.

Methods

Data sources

Information was extracted from death registers, autopsy reports and ancillary police and laboratory documentation from the two medicolegal laboratories (state mortuaries) at Salt River and Tygerberg for the period 1 January 1994 to 31 December 1994. All deaths in South Africa due to other than natural causes require examination by a district surgeon, forensic pathologist or medical practitioner, in terms of the Inquests Act.¹³ As no legal definition of non-natural mortality exists, it is current practice to admit to the medicolegal laboratories those in whom it is impossible to determine the cause of death. Deaths while under the influence of local or general anaesthetic or where the anaesthetic could have been a contributory factor are regarded as due to non-natural causes.¹⁴ The Cape Town metropole historically comprises the 01 statistical region including the Kraaifontein area and, for the purposes of the capture of non-natural mortality data, is regarded as the area served by the medicolegal laboratories at Salt River and Tygerberg.

Key variables

Ages of the deceased were extracted from the death registers of the medicolegal laboratories. Where possible, these ages were obtained during the identification process (when the deceased's next of kin and/or identity document were available). Cause of death coding is based on the 1975 *International Classification of Diseases*.¹⁵ Non-natural death (death by injury — either intentional or unintentional) is coded as E800 to E999. Cause of death is recorded according to suggested Centers for Disease Control (CDC) protocols for medical examiner surveillance systems (G. Parrish, CDC — personal communication).

Data quality and analysis

The non-natural deaths contained in the death registers of the two medicolegal laboratories are regarded by pathologists and epidemiologists as representative of almost all mortality due to violence and injury in the Cape Town metropole. As non-natural death invariably has legal and financial implications, it is likely that this mortality enters the vital registration system.^{2,6,8} Furthermore, misclassifications of non-natural death as due to natural causes are generally regarded as unusual, as most medical practitioners are reasonably concerned about the medicolegal implications of not referring these cases to the relevant authorities. It is possible that some in-hospital deaths, related to the late effects of injury, may have been certified as due to natural causes, and were therefore not admitted to the medicolegal

laboratories. An example of such a case would be a patient in a chronic vegetative state as a result of a head injury, who died of bronchopneumonia after a protracted period. The good coverage of injury deaths in the Cape Town metropole by the medicolegal process was demonstrated in a study of occupational fatalities, which found that while 28% of these deaths were not reported to the occupational safety authorities, it was not possible to locate any fatalities that were not admitted to a medicolegal laboratory.¹⁶

As this study aimed to provide a complete and accurate database on non-natural mortality in the Cape Town metropole during 1994, data cleaning comprised several steps: (i) all records with mismatched cause of death categories between mortuary records and autopsy data were extracted and examined; (ii) records of patients with an ill-defined cause of death* were extracted and, where possible, a more specific cause of death was assigned, using all available secondary data sources; (iii) missing data, where possible, were obtained from autopsy and hospital reports.

The data were captured using the epidemiological database package, Epi Info 5.¹⁷ Frequency counts were used to show the distribution of cause of death by age.

Results

In 1994, there were 1 789 homicide, 291 suicide, 1 130 transport and 714 other non-natural fatalities in the Cape Town metropole (Table I). Sharp force (938) and firearms (462) were the most common causes of death in the homicide category (Table II). Most homicides occurred in the 15 - 24-year (565) and 25 - 34-year (644) age categories. Homicide was the cause of death of 230 women, 67 children (younger than 15 years) and 53 elderly (over the age of 60 years). Most homicides (60%) occurred in 10 suburbs, with Khayelitsha (239), Nyanga (164), Guguletu (126) and Mitchell's Plain (124) ranking highest. Almost 40% of suicides (114) involved the use of firearms. Seventeen female suicides occurred in the 15 - 24-year age category. Suicide was the cause of death of 29 elderly and 5 children. Two childhood suicides were attributed to the use of firearms (Table III).

Table I. Mortality counts for major causes of non-natural mortality in the Cape Town metropole (1994) by cause of death

Cause of death	No. of deaths
Homicide	1 789
Transport accidents	1 130
Fire	295
Suicide	291
Drowning	96
Falls	89

The most common causes of death in the transport category were: motor vehicle/pedestrian (761), motor vehicle/passenger (131), motor vehicle/driver (79) and railway fatalities (130). The highest number of transport-related fatalities occurred in the 25 - 34-year age category (304). The deaths of 156 children were transport-related (Table IV).

There were 677 deaths from other accidental causes of non-natural mortality and a further 37 of undetermined cause (either homicide, suicide or accidental death). The age category composition of the most important other

* The categories termed 'ill-defined' included skeletal remains, unknown whether homicide, suicide, accident or other; unnatural death, unknown whether homicide, suicide, accident or other; homicide undetermined; suicide undetermined and accident by other/unspecified causes.

causes of non-natural death are shown in Table V. Most of these deaths were due to fire (295), surgical/medical procedures (120), drowning (96) and falls (89). Spatial analysis of the distribution of death by fire showed that 73% of fatalities occurred in 10 main areas. The 88 deaths in Khayelitsha accounted for 30% of all deaths by fire in the Cape Town metropole in 1994. Drowning remains a problem of the young, with 35 deaths (36%) of children recorded.

Discussion

Violence and injury accounted for approximately 30% of all-cause mortality in the Cape Town metropole during 1994. An increasing proportion of both firearm homicides and suicides have occurred in Cape Town since 1986.¹⁸ The availability of firearms in the home is regarded as a risk factor for suicide, and may be associated with the increased risk of adolescent suicide.²⁰

Table II. Age distribution of homicide in the Cape Town metropole (1994) by cause of death

Cause of death	Age (yrs)								Total
	0 - 14	15 - 24	25 - 34	35 - 44	45 - 54	55 - 64	65 - 74	75+	
Sharp force	14	314	369	143	70	21	6	1	938
Firearms	8	196	156	66	24	9	2	1	462
Blunt force	9	36	69	59	28	18	5	9	233
Undetermined	9	3	28	17	7	1	3	3	71
Strangulation	13	4	6	3	1	0	1	4	32
Legal intervention	1	10	14	6	0	0	0	0	31
Child abuse*	12	0	0	0	0	0	0	0	12
Burns	0	2	2	0	0	2	1	0	7
Late effects	1	0	0	2	0	0	0	0	3
All causes	67	565	644	296	130	51	18	18	1 789

* Infanticide and fatal child abuse, according to police records.

Table III. Age distribution of suicide in the Cape Town metropole (1994) by cause of death

Cause of death	Age (yrs)								Total
	0 - 14	15 - 24	25 - 34	35 - 44	45 - 54	55 - 64	65 - 74	75+	
Firearms	2	28	39	16	13	3	6	7	114
Hanging	2	13	24	11	4	4	0	2	60
Poisoning	0	8	7	14	9	2	3	1	44
Gassing	1	5	4	5	7	1	2	1	26
Motor vehicle exhaust	0	0	6	13	4	2	1	0	26
Trains	0	5	2	1	0	0	0	0	8
Jumping	0	4	1	0	0	1	1	0	7
Unspecified	0	0	2	1	1	1	0	1	6
All causes	5	63	85	61	38	14	13	12	291

Table IV. Age distribution of transport-related mortality in the Cape Town metropole (1994) by cause of death

Cause of death	Age (yrs)								Total
	0 - 14	15 - 24	25 - 34	35 - 44	45 - 54	55 - 64	65 - 74	75+	
MVA — pedestrian	123	106	202	158	85	43	28	16	761
MVA — passenger	22	33	36	16	8	7	5	4	131
MVA — driver	2	16	28	11	11	3	6	2	79
Railway accident	6	32	30	33	15	10	1	3	130
Motorcycle	1	4	5	1	0	0	0	0	11
Bicycle	1	2	2	1	0	1	0	0	7
Other vehicle	1	1	1	2	0	0	1	0	6
Sporting accident	0	0	0	0	1	0	0	0	1
Air transport	0	2	0	0	2	0	0	0	4
All causes	156	196	304	222	122	64	41	25	1 130

Table V. Age category distribution of other non-natural mortality in the Cape Town metropole (1994) by cause of death

Cause of death	Age (yrs)								Total
	0 - 14	15 - 24	25 - 34	35 - 44	45 - 54	55 - 64	65 - 74	75+	
Fire	75	34	75	60	26	14	7	4	295
Surgical/medical procedures	14	6	9	11	15	26	27	12	120
Drowning	35	10	16	16	12	3	1	3	96
Falls	9	6	11	17	20	9	8	9	89
Poisoning	3	1	5	8	1	1	0	0	19
Excessive cold	0	0	0	1	2	0	1	0	4
Electric current	0	0	0	4	0	0	0	0	4

Transportation accounted for almost one-third of injury death in Cape Town during 1994. The large number of pedestrian fatalities is cause for concern, especially in the light of the almost exclusive media focus on drivers and alcohol. In the UK, pedestrians and cyclists account for one-third of all fatal and serious injuries on the roads, although they account for only about 7% of all mileage travelled.²¹ The 130 railway-related deaths resulted in a mortality rate of 35/100 million passenger journeys, almost six times the fatality rate on the London Underground in 1993.²²

Other accidental non-natural deaths, although they comprise a smaller proportion of total deaths in the Cape Town metropole, are amenable to intervention strategies. Fires accounted for most of the fatalities in this category. Most deaths by fire occur in areas with large numbers of informal dwellings and limited access to electricity. There were a number of fresh-water drownings in canals, ponds and rivers. Many of the 14 drownings that occurred in Table Bay harbour were work-related. Occupational injuries were associated with fatal falls in the younger age categories, and have historically been underreported.¹⁶

Forensic data can be used to obtain accurate and complete information on deaths, better to understand the causes of these deaths and reduce those amenable to public health intervention.^{23,24} The current medicolegal process in South Africa lends itself to the provision of a comprehensive database on non-natural mortality, because of the statutory requirement for postmortem examination in these cases.¹³ Unfortunately, no data collected at local medicolegal laboratory level is fed into either provincial or national health information systems. This tragic waste of important information can, to some extent, be curtailed through the use of large metropolitan medicolegal laboratories as sentinel surveillance sites.²⁵ The potential benefits of postmortem examination findings for public health surveillance of injuries and the improvement of trauma care are substantial.²⁶ A medical examiner/coroner information-sharing programme has been developed by the CDC which aims to: (i) obtain more timely, accurate and complete information on non-natural deaths; (ii) better understand the causes of these deaths; and (iii) reduce the mortality from those causes amenable to intervention.²⁷

In the USA, targets for the reduction of injury and violence mortality have been set for the year 2000 and rates are being calculated on a yearly basis to monitor the effects of safety regulation and policy decisions.²⁸ In the USA, the consensus set of health status indicators for statewide surveillance includes: homicide and suicide rates, motor vehicle accident death rates and a work-related injury death rate.²⁹ It is hoped that a similar monitoring strategy will be adopted in South Africa as part of a public health approach to the reduction of injury and violence. The Department of Health recently released a discussion document, *Health Goals, Objectives, Strategies and Indicators for South Africa*. Violence and injury indicators are included in priority areas such as child, women's and adolescent health, occupational health, emergency services, substance abuse and mental health.³⁰

This article demonstrates the utility of routinely available data in providing information on the causes, and demographic and spatial features of violence and injury mortality. The data described have formed the foundation of a report that has been incorporated into the Draft Provincial Health Plan for the Western Cape.³¹ It is hoped that this

study will stimulate stakeholders at a provincial and national level to initiate similar projects. This would provide a more accurate picture of the debilitating effects of violence and injury in South Africa and contribute to the debate on avenues for prevention and health promotion.

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