

National Injury Mortality Surveillance System

A PROFILE OF FATAL INJURIES IN SOUTH AFRICA 1999

First Annual Report of the National Injury Mortality Surveillance System

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for

The Violence and Injury Surveillance Consortium, with Participating
Forensic Pathologists and the State Forensic Chemistry Laboratories

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EXECUTIVE SUMMARY

This is the first annual report of the National Injury Mortality Surveillance System (NIMSS). NIMSS is a mortuary-based system capturing 21 information items describing the “who, what, when, where and how” of fatal injuries. Despite its importance, such information has been missing from the national vital statistics on causes of death since 1991, and there are no indications that this situation will change in the near future.

This report covers 1 January to 31 December 1999, during which 14 829 fatal injuries were registered at 10 mortuaries in five provinces. This is approximately 25% of the estimated 60 000 fatal injuries occurring for the whole country each year, and the 1999 sample was biased to mainly urban areas. The NIMSS aims to progressively expand its geographical and case coverage until all injury deaths are included in what is intended to be an ongoing system for the epidemiological surveillance of fatal injuries.

Sex, age and population group. Of the 14 829 non-natural deaths, 21% were female and 79% male. Asians constituted 3% of all cases, Whites 11%, Coloureds 17% and Blacks 69%. The majority of victims were young adults, with 36% of all cases aged 15 to 29, and 37% aged 30-44. Seven percent of the victims were aged 0 to 4 years, 14% were aged 45 to 59 years and 6% were 60 years and over.

Manner of death. Homicide was the leading manner of death, accounting for 46% (N = 6 859) of all cases. Accidents accounted for 34% (N = 5 090), followed by suicide (8% or 1 157 cases). For 12% (N = 1 723) manner of death was undetermined. Males constituted 79% of all injury deaths, and there were 3.8 male deaths for every female death. The leading manner of death for males was homicide (51%) and for females, accidents (43%). The number of cases per month trended upward across the year for all manners of death except suicide.

External causes of death. Firearms overshadowed all other external causes, and accounted for 26% of all cases. The total of 3 906 firearm deaths was greater than the 3 684 deaths due to all motor vehicle accident (MVA) categories combined. In infants under one year, burns were the leading cause of death. From age 1 to 4 burns and pedestrian MVA deaths ranked first and second. From 5 to 14 years pedestrian injuries and drowning ranked first and second. From 15 to 64 firearms ranked first, and for those cases aged 65 years or more, firearms and MVA pedestrian deaths were approximately equal.

Homicide. Over half of the 6 859 homicides were inflicted by firearms, and a third by sharp instruments. The number of homicide victims rose abruptly in the 15 to 19 year age group and remained high until 39 years. There were 6.5 males per female homicide victim. Of the males, 51.7% were killed using firearms, while firearms accounted for 40.4% of female homicides. Strangulation homicides were over 6 times more frequent in females than in males. Strangulation and blunt instruments dominated up to 4 years of age, where after firearms and sharp instruments together accounted for around 80% of homicides per age group. Most homicides occurred in

private homes, and nearly 80% of sharp instrument victims had positive blood alcohol concentrations (BACs) in contrast to the 40% of firearm victims with positive BACs.

Suicide. Firearms and hanging each accounted for one third of all 1 157 suicides. Most suicide victims were between 20 and 30 years of age. There were 3.5 males for every female suicide. The leading external causes of suicide in males were firearms (37.8%) and hanging (37.7%), and in females poisoning (29.9%) and firearms (26.0%). Most suicides occurred in private homes, and 27 suicides were recorded as having occurred at or in places of custody. Under half of all suicide victims had elevated BACs.

Fatal accidents. Accident deaths due to transport, burns, falls and drowning, and other external causes accounted for 5 090 or 34% of all fatal injuries. Of these 77% were transport-related, 9% were due to burns, 5% due to drowning, and 8% due to other external causes.

Transport-related deaths. Of the 3 880 transport-related deaths, 92% were MVAs, 5% were railway-related and 3% involved cyclists. Pedestrians accounted for 39% of the MVAs, followed by 27% where the user category was unknown. There were 2.9 males per female transport-related death. Pedestrian deaths ranked as the top external cause of death from age 1 to 14 years, among the top three from 15 years onwards, and as the third leading cause across all ages. Most MVA-related deaths occurred from early afternoon to mid-evening on Fridays and weekends. BAC was positive for 65% of pedestrians and 53% of drivers.

Burns, falls, drowning and other accident deaths. Of the 1 169 deaths due to these causes, 41% were due to burns, 27% due to a cluster of 'other' accidents, 20% drowning, and 12% falls. Burns were the leading external cause of death under one year of age, and drowning ranked equal second with pedestrian deaths in this age group. Burns and drowning were the second and third leading external causes of death from 1 to 4 years of age, and drowning the second leading cause from 5 to 14 years. There were 4 males per female victim of drowning and falls, as against 1.5 males per female burn death. Most burn and fall deaths occurred in private homes, and drowning deaths in the sea, lakes and rivers, although a substantial proportion of drownings also happened in private homes. BACs were positive in 52% of the burn fatalities, 42% of the drowning deaths and 28% of the falls. There were 318 fatal accidents due to 'other' causes. In adults, contact with blunt objects (e.g. falling masonry) and crushing (mostly in mine accidents) were among the leading causes. In infants and children choking and poisoning by ingestion (e.g. of paraffin and other household chemicals) were prominent.

Manner of death undetermined. The age distribution of the 1 723 deaths where the manner was undetermined showed a concentration of cases among the very young (0 to 4) and the elderly (65 years and over). For deaths between these age groups the pattern by victim age and seasonal trend for deaths where the manner was undetermined was similar to that for suicides.

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PREFACE

Information about deaths due to external causes is of critical importance for monitoring demographic, seasonal and socio-economically related trends in major causes of death and disability such as homicide, motor vehicle accidents, burns, falls, and drowning. Despite its importance, such information has been missing from the national vital statistics on causes of death since 1991, and there are no indications that this situation will change in the near future.

The National Injury Mortality Surveillance System (NIMSS) was established to fill this gap by providing information about deaths due to external causes. The information is collated from existing investigative procedures at mortuaries, state forensic chemistry laboratories and the courts. All deaths due to external causes are included, allowing an overview of how the different categories of external cause (e.g. gunshots, burns) contribute to the profile of non-natural mortality in men, women, and children.

As of November 2000 there were no alternative sources for the information about fatal injuries that the NIMSS collects, analyses and disseminates. It is therefore essential that the system establish links with vital statistics so that the information vacuum around non-natural deaths in the vital statistics is filled. It is also important to link the system with the police data base, so that levels of under-reporting deaths due to interpersonal violence and motor vehicle accidents can be established. Similar reasoning underlies the need to link the NIMSS with the national database on road accidents and injuries.

The utility of the information collected by the NIMSS lies in the pointers it provides for improving the prevention and control of injuries in South Africa, and in evaluating the impact of direct (e.g. gun law enforcement) and indirect (e.g. socio-economic development) interventions that should reduce some of the major causes of fatal injury. This first report, although limited in coverage to only 25% of all non-natural deaths, provides a baseline profile for future monitoring and an information platform to reinforce the ongoing extension and improvement of the system.

The NIMSS data reported here are limited to the numerator data, and a major challenge is to establish useful denominators. This is most likely to be successful if done at the level of each participating mortuary's catchment area, until all mortuaries serving a particular geographical area are included and rates can be calculated for entire cities, provinces and the country as a whole.

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Deputy National Commissioner L.J. Eloff, and Mr. J.J. Botma facilitated establishment of the NIMSS among the various South African Police Services personnel at provincial and mortuary level.

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1. THE NATIONAL INJURY MORTALITY SURVEILLANCE SYSTEM

The National Injury Mortality Surveillance System (NIMSS) produces and disseminates descriptive epidemiological information for deaths due to non-natural causes that in terms of the Inquests Act of 1959 are subject to medico-legal investigation. The ultimate goal is to establish a permanent system that will register all such deaths that occur annually in South Africa.

1.1 Goals of the NIMSS

The goals of the NIMSS are:

- to provide ongoing and systematic information about the incidence, causes and consequences of all non-natural deaths at local, regional and national levels
- to enable the early identification of new injury trends and emerging problem areas so that adequate interventions can be timeously established
- to determine priorities for injury and violence prevention action, both for high-risk groups and socio-environmental risk factors
- to help evaluate direct and indirect violence and injury prevention and control measures
- to monitor seasonal and longitudinal changes in the non-natural fatality profile.

In achieving these goals the NIMSS is intended to meet the information requirements of three main stakeholder groups, namely the forensic medico-legal services; the national crime prevention strategy; and violence and injury prevention agencies at local, provincial and national level.

For **Forensic medico-legal services** the NIMSS will provide vital information for the allocation of resources, auditing of costs and rationalisation of services. The current absence of information and the fragmented nature of these services prevents proper assessment of their costs, inhibits their evaluation and impedes proper planning.

For the **National Crime Prevention Strategy** the NIMSS will provide crucial baseline data for all deaths due to violence and other injuries, including information on particularly sensitive indicators such as gunshots, alcohol and other substance involvement, the covariance between violence and unintentional injury deaths, and demographic and geographic variations in the magnitude and patterning of violent deaths.

Injury prevention agencies include national and local government, the South African Police Services, non-governmental organisations, business and para-statal. The NIMSS will provide descriptive information needed for the design and implementation of preventive interventions at municipal, metropolitan, provincial and national levels.

1.2 Aims of the NIMSS

The NIMSS uses existing medico-forensic investigative procedures. It collates onto a single data form and into a single computer database items spread between four points in the investigative procedure, namely postmortem reports, SAP 180 forms, chemical pathology laboratories and criminal justice system reports.

For 1999 to 2000 the NIMSS is being piloted with funding from the Department of Arts, Culture, Science and Technology's Innovation Fund on Crime Prevention. It has been introduced into 10 mortuaries around the country and the aim is to evaluate and refine the system before extending it as a uniform reporting system to all medico-legal examination centres in South Africa.

1.3 NIMSS Methodology

The NIMSS records 21 items of information for every deceased that enters the forensic medico-legal system in the participating facilities. To meet the system goals and enable international comparisons, the NIMSS classifies the primary medical cause of death using the International Classification of Disease version 9 (ICD 9) and assigns a probable manner of death code to each case. Spatial and temporal data is recorded, as is the presence of alcohol or any other substances in the deceased through information from forensic laboratory reports. Court findings will be used to assign a final manner of death code and specify the circumstances surrounding violent deaths.

The data are collected by the police and forensic pathologists at each site, and captured into a computerised database by clerks and secretarial staff at the mortuaries. The data are then sent to the consortium where they are combined with other mortuaries' data and data from the forensic chemistry laboratories, cleaned, and finally analysed by specialist research scientists. Quarterly and yearly reports are produced for the South African Police and forensic pathologist at each facility.

1.4 NIMSS Annual Report

The NIMSS annual report summarises the data from all mortuaries that participated during the reporting year. Since this is the first such report, it is hoped that readers will provide suggestions about how the data presentation can be improved to make subsequent annual reports as useful as possible for their purposes. We assume that the main utility of the report will be in providing information for use in presentations and research projects aimed at violence and injury prevention and control. We also hope that the report will serve to raise more questions than answers about the underlying causes and risk factors that drive the patterns of fatal violence and injury among the different age, sex and population groups by which the data have been analysed. For, if these questions can stimulate research to answer them, then the possibilities of violence and injury prevention will be greater than ever before.

Perhaps most importantly, it is emphasised that the annual report provides an overview of the data only, and does not fully reflect the rich amount of information in the surveillance database. This additional information includes, in particular, suburb-level indicators of where injuries occurred, and, of course, many cross-tabular analyses that could not be accommodated in this summary report. Agencies wishing to access this more detailed level of information are invited to send their requests for customised reports to the surveillance consortium.

2. PARTICIPATING FACILITIES AND DATA REPRESENTIVITY

Ten mortuaries in five provinces collected data for the period 1 January to 31 December 1999 (Table 1).

Table 1.Count of cases by province and Mortuary

| Province | City | Mortuary | TOTAL |
|---------------|----------------|-----------------|--------------|
| Eastern Cape | | | |
| | East London | East London | 991 |
| | Port Elizabeth | Louis le Grange | 402 |
| | Port Elizabeth | Gelvandale | 578 |
| Northern Cape | | | |
| | Kimberley | Kimberley | 432 |
| K.Z. Natal | | | |
| | Durban | Gale Street | 2621 |
| Gauteng | | | |
| | Pretoria | MEDUNSA | 544 |
| | Johannesburg | Germiston | 3375 |
| | Johannesburg | Roodepoort | 1388 |
| Western Cape | | | |
| | Cape Town | Salt River | 2483 |
| | Cape Town | Tygerberg | 2015 |
| TOTAL | | | 14829 |

A total of 14 829 fatal injuries were registered. This is nearly 25% of the estimated 60 000 non-natural deaths that occur in the whole country each year. The registered cases reflected the fatal injury profile for largely urban areas. Representivity was therefore low for all provinces. However, for the Cape Town metropole all mortuaries serving the area were included. City-level representivity was lowest for Johannesburg and Durban. In Johannesburg, only two out of seven mortuaries participated, and in Durban only one out of three. Because the registered cases were not adequately representative of most areas in the country, the data were not used to calculate rates, and the subsequent tables and graphs are restricted to simple descriptive analyses of the data on fatal injuries only.

Of the 14 829 non-natural deaths, 21% were female and 79% male. Asians constituted 2.7% of all cases, Whites 10.8%, Coloureds 17.3% and Blacks 69.3%. The majority of victims were young adults, with 36% of cases aged 15 to 29, and 37% aged 30 to 44. Four percent of the victims were aged 0 to 4 years, 15% were aged 45 to 59 years and 6% were 60 years and over.

For the year 2000, the NIMSS will double the case coverage to register approximately 50% of all non-natural deaths. This will involve the establishment of surveillance sites in most of the currently excluded provinces, as well as the addition of extra sites in major urban areas such as Johannesburg, Pretoria, Durban, Port Elizabeth and East London. Further expansion will occur in subsequent years until total case coverage is achieved.

Not all cases had information for every item, and therefore totals in the following graphs and tables vary. Owing to the relatively few cases where date and time of injury were available, date and time of death have been reported instead. While death would have occurred at the time of injury for a majority of cases, some victims will have died hours or days after the injury itself, and this bias must be kept in mind when reading the relevant tables and charts. Although information on drugs and other substances apart from alcohol was retrieved, this was available for only 91 (0.6%) of all cases. Accordingly, only the findings for blood alcohol content (BAC) are reported as g/100ml.

While the NIMSS also has provision to register perpetrator information and context of violence for homicides and suicides, the collection of this data can only occur after court investigations are concluded. This takes approximately two years, and therefore court information for the cases described here will become available only in 2001.