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Estimating the South African trauma caseload

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A survey of medical superintendents revealed that an estimated 1.5 million trauma cases presented to South Africa's 356 secondary and tertiary level hospitals in 1999. Injury rates for traffic, violence and other injuries showed considerable inter-provincial variation, with violence accounting for more than half of the trauma caseload. This type of survey is a simple low cost alternative for monitoring injury patterns and supplementing burden of disease and injury costing studies.

1. Introduction

National and local government, service planners, non-governmental organizations and the media are increasingly calling for a comprehensive approach to address the epidemic of injury and violence in South Africa. However, this has been compromised by lack of data. In the late 1990s, a consortium of research organizations successfully implemented a national injury mortality surveillance system (Butchart *et al.* 2001), but were less successful in establishing a non-fatal injuries surveillance system that would be suitable for the design and evaluation of injury prevention interventions.

In this short report, the results of a rapid assessment, conducted during the piloting of the non-fatal injury surveillance study, are described. The aim of the assessment was to ascertain trauma caseloads at secondary and tertiary level state health facilities to provide a baseline measure from which to monitor injury trends and to inform the establishment of a nationally representative sentinel system.

2. Materials and methods

Brief questionnaires were sent to medical superintendents at 356 secondary and tertiary level health facilities requesting information about trauma caseloads. A weighted analysis was used with a finite population-correcting factor and 95% confidence intervals to estimate the total population within provinces and nationally. Caseload data for non-responding facilities were extrapolated by weighting the responding facilities within each province for the total sample, i.e. non-responding facilities were assumed to average the same caseload as responding facilities in each province. The distribution of injuries due to traffic, violence and other causes was also assumed to mirror the cumulative provincial proportions from responding facilities. Injury rates were calculated from these estimates using the population figures from the 1996 National Census and a 95% confidence interval was calculated for the total injury rate in each province.

As many of the reported caseloads were rounded to the nearest 1000, as they had been estimated by respondents and not based on collected data, the combined estimate was subject to a reporting error, which is not reflected in the current standard errors or confidence intervals.

3. Results

A total of 318 trauma-treating facilities were identified, of which 67% responded to the questionnaire. The provincial

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response rates were as follows: 56% of the trauma-treating facilities from the Eastern Cape; 79% from the Free State; 67% from Gauteng; 70% from KwaZulu-Natal; 79% from Mpumalanga; 89% from Northern Cape; 49% from Limpopo Province; 45% from North-West Province; and 100% from the Western Cape. Incident cases were quantified by 209 (98%) of the trauma-treating facilities that responded to the questionnaire, while 168 (79%) of these facilities specified the proportion of injuries that were due to violence, traffic and other injuries. The total annual caseload from responding facilities was more than 1 million, which was extrapolated to 1.5 million for all state facilities (table 1). The mean number of cases per facility varied considerably, with Gauteng hospitals reporting the highest average of 11 023 cases per year (30 per day).

Most of the data (82%) were available from the hospital's trauma registers, while 18% of the hospitals collected statistics specifically for the purposes of this study. A review of hospital trauma registers revealed that the name, age, sex, place of residence and a brief description of the injury (e.g. assault, road traffic injury, burn, etc) was typically recorded, which was not sufficient for an injury surveillance system to inform the design and evaluation of prevention programmes.

More than half of all the injuries were attributed to violence, although there was some inter-provincial variation, as violence accounted for 64% of trauma cases in the Northern Cape and only 33% in the Limpopo Province. The Northern Cape had the highest overall injury rate (81 per 1000), followed by the Western Cape (59 per 1000) and these provinces also reported higher rates of violence-related injuries (table 2).

4. Discussion

It was estimated that the annual trauma caseload at secondary and tertiary level health facilities was approximately 1.5 million (40 per 1000 population). However, previous epidemiological studies of injuries at all severity levels indicated that more than half of all injuries presented at other treatment sites, including clinics, traditional healers and private hospitals and practitioners (Butchart *et al.* 1997), implying that the national total at all treatment centres and levels of severity would be greater than 3 million (80 per 1000 population). While violence was the

Table 1. Annual trauma caseloads by province.

	No. of facilities supplying caseloads (1)	No. of reported cases (2)	Mean no. of cases per facility (SE) (3)	No. of facilities not supplying caseloads (4)	Total no. of trauma cases (2) + (4) × 3
Eastern Cape (n = 59)	33	150 705	4567 (1321)	26	268 255 (110 222 – 426 288)
Free State (n = 28)	21	79 626	3619 (1181)	7	105 903 (34 052 – 177 754)
Gauteng (n = 27)	18	198 406	11 023 (2386)	9	297 609 (161 662 – 433 556)
KwaZulu-Natal (n = 56)	38	200 144	5267 (1106)	18	294 212 (169 080 – 419 343)
Mpumalanga (n = 24)	18	41 759	2320 (376)	6	55 539 (36 573 – 74 506)
Northern Cape (n = 18)	15	50 414	3361 (996)	3	60 497 (22 051 – 98 943)
Limpopo Province (n = 44)	22	52 112	2369 (1058)	22	104 244 (7402 – 201 086)
North West Province (n = 31)	14	36 954	2640 (1091)	17	81 668 (8754 – 154 582)
Western Cape (n = 31)	30	236,032	7,868 (1,065)	1	243 113 (175 821 – 310 405)
All provinces (n = 318)	209	1046 152	4742 (284)	109	1511 040 (1335 011 – 1687 068)

Table 2. Distribution of annual trauma rates per 1000 population, South Africa, 1999.

	Population	Estimated violence injury rate	Estimated traffic injury rate	Estimated other injury rate	Total injury rate
Eastern Cape	5865 000	27	9	9	45.7 (18.8 – 72.7)
Free State	2470 000	27	7	9	42.9 (13.8 – 71.9)
Gauteng	7171 000	17	9	16	41.5 (22.5 – 60.4)
KwaZulu-Natal	7672 000	16	10	12	38.3 (22.0 – 54.6)
Mpumalanga	2646 000	10	5	5	21.0 (13.8 – 28.1)
Northern Cape	746 000	52	8	21	81.1 (29.6 – 132.7)
Limpopo Province	4128 000	8	13	4	25.3 (1.8 – 48.7)
North West Province	3043 000	18	4	4	26.8 (2.9 – 50.8)
Western Cape	4118 000	31	9	19	59.0 (42.7 – 75.4)
All provinces	37859 000	20	8	11	40.0 (35.2 – 44.6)

leading cause of injury in eight of South Africa's nine provinces, the proportions of violence, traffic and other injuries showed considerable inter-provincial variation.

A review of the medical literature revealed few internationally comparable non-fatal injury data. In Thailand in 1983 nearly 2 million injured people were treated in hospitals, representing a rate of 40.4 per 1000 population, while in the United States, the 2.8 million annual hospital admissions (Berger and Mohan 1996) represented a rate of 56 injuries per 1000 population. Although the South African rate for injuries presenting at secondary and tertiary facilities of 40 per 1000 population seems comparable, the finding is surprising, as South Africa's fatal injury rates for violence and transport are believed to be among the world's highest (Peden and Butchart 1999). The phenomenon could be ascribed to different thresholds of presentation in poorer countries, as a result of reduced access to care and different health-seeking behaviours among the injured. Health-care consumers afflicted by a variety of ailments compete for a limited number of beds and only the more severely injured patients seek medical attention. On a macro level, fiscal constraints limit the number of facilities, beds and the level of care available to the injured, while concurrently giving rise to an environment where safety is compromised. Furthermore, in societies where injury is endemic, the perceived injury severity is lower and patients with minor injuries are less likely to seek medical attention.

Although this rapid assessment was successful in establishing the national injury caseload at secondary and tertiary facilities, it became apparent during the piloting of surveillance instruments that it would not be possible for the research consortium to manage and maintain a national system without considerable financial and logistical support from government. In the absence of this support, rapid assessments, such as the one described above, will be conducted at 5 year intervals to monitor injury patterns and trends and supplement burden of disease and injury costing studies, while the researchers will continue to encourage provincial and national departments of health to implement comprehensive injury surveillance systems.

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