Original Articles

Deaths due to road traffic crashes in Hyderabad city in India: Need for strengthening surveillance

RAKHI DANDONA, ASHISH MISHRA

ABSTRACT

Background. Road traffic crashes are an important cause of death and disability in India. Reliable and accurate data are necessary to plan strategies to reduce death and disability due to road traffic crashes. We assessed the utility of the available data on deaths due to road traffic crashes for road crash surveillance for a major metropolitan city of southern India.

Methods. We analysed the Department of Police database on deaths due to road traffic crashes for 2002 in Hyderabad, southern India and collected data from a leading newspaper for the same information using a standardized format.

Results. A total of 3039 cases of road traffic crashes were recorded in the police database for 2002, including 400 cases (13.2%) in which 411 people were killed. In the same year, 316 cases of road traffic crashes resulting in 353 deaths were reported in the newspaper. The majority of those who died due to these crashes were males. Seventy per cent of those killed were between 16 and 49 years of age. Pedestrians and riders of two-wheelers were the most vulnerable. Collision with a vehicle caused 86.4% of all crashes and 60% of the victims died before reaching a hospital. The available data were not comprehensive enough to provide a thorough basis for planning intervention strategies to reduce fatalities due to road crashes.

Conclusion. Despite the gaps in reporting of fatalities in road traffic crashes in these data sources, they provide insights into the magnitude and nature of deaths resulting from such crashes in Hyderabad. The available data have limitations and there is a need for strengthening the road traffic crash surveillance system to have reliable, accurate and adequate data on road traffic crashes and the resulting fatalities and injuries. These could then form the basis for planning effective intervention strategies to improve road safety.

Natl Med J India 2004;17:74–9

INTRODUCTION

Motor vehicle crashes are a common cause of death, disability and demand for emergency medical care. Globally, about 1 million people die each year from traffic crashes and about 20–50 million are injured or permanently disabled.[1] In 2000, road traffic injuries were ranked as the ninth leading cause of death and the eighth leading cause of disability-adjusted life-years (DALYs) lost globally by the Global Burden of Disease Study.[2] It is projected that by 2020, road traffic injuries would be the third leading cause of DALYs lost globally if the current trend continues.[2]

In 1998, deaths due to road traffic crashes were the seventh leading cause of death in all age groups in India.[1] According to the National Crimes Record Bureau, 76 732 people were killed in 300 000 road traffic crashes in India in 1998[3] and, for the same year, according to the WHO, about 217 000 people were killed in road traffic crashes in India.[1] Although the leading causes of death in India in numerical terms are cardiovascular diseases, respiratory infections and diarrhoeal diseases, the ranking of causes of death changes when age-at-death is considered. Road traffic crashes are the third leading cause of death for people between 5 and 44 years of age.[1] It is estimated that the morality rate in road traffic crashes has risen from less than 30 per 100 000 in the early 1970s to more than 50 per 100 000.[4] Despite this, road safety has not received enough attention in India as well as in many other developing countries, and hence has also not received adequate attention in health research and policy.

Experience in industrialized countries shows that concerted action based on reliable data and road safety research can lead to reduction in mortality rates due to road traffic crashes.[5,6] A critical first step towards improving road safety is the availability of reliable, accurate and adequate data on road crashes and the resulting fatalities and injuries.

Against this background, we assessed the adequacy of the available data on deaths caused by road traffic crashes for planning action to reduce fatalities due to road crashes in Hyderabad city, the sixth largest city in India with a population of 5.7 million in 2003.[7] The available data sources for road traffic crash deaths in the city were the police records, death certificates from hospital records and newspapers. We used data on road traffic crash deaths from two of these three sources—the police database and a leading local newspaper, as data from these sources are relatively easily available in the public domain. The police database was used for this analysis because it is the legal source of information that feeds into policy-making. Even though news of deaths in road crashes are, at times, reported dramatically in the newspapers, the newspaper data were used because these data are accessible to the public at large. Frequent reporting of deaths due to road traffic crashes is read by the public, including policy-makers, and has the potential to influence the mindset of the public to perceive road traffic crashes as a major problem that needs to be addressed. We did not use hospital records as such data on fatal road traffic crashes would, in all likelihood, already be reflected in the police records and, in addition, hospital data were not readily accessible.

METHODS

The data on deaths due to road traffic crashes in the city are reported to the office of the Deputy Commissioner of Police (DCP), Traffic every morning by each police station in the city. Two data entry operators at this office enter data on a daily basis in a FoxPro database. Access to these data for analysis was given

Centre for Public Health Research, Administrative Staff College of India, Bella Vista, Raj Bhavan Road, Hyderabad 500082, India
RAKHI DANDONA, ASHISH MISHRA

Correspondence to RAKHI DANDONA; *rakhi@asci.org.in*

© *The National Medical Journal of India 2004*

by the DCP. The variables recorded in the police database were date, time and location of the road traffic crash; name of the police station of jurisdiction and street code; victim and 'accused' vehicle with identification numbers of the vehicles; nature and cause of the crash; number of people injured and dead; name, age and sex of the victims; name and address of the kin of the victim.

Three leading newspapers of the city were reviewed for information on road traffic crashes for a month to assess the extent of their coverage. We chose one of these, *Deccan Chronicle*, which publishes a daily column 'Police roster' that carries news related to injuries (road traffic crashes, suicides, homicides, fire injuries and violence), thefts, and other crimes that are under the jurisdiction of the city police. The sources of news on road traffic crash deaths for this column were information from the police headquarters and government hospitals that are designated for conducting postmortems. A data collection format was designed to capture the details of the road traffic crashes that resulted in death, based on a review of newspaper reports to determine all the variables that could be recorded. The variables included date and day of road crash; vehicles involved; number of people dead and injured; nature of crash; and victim's age, sex, driving status and time of death. Any other information available was noted under 'comments'. Data on road traffic crashes that resulted only in injuries and not deaths could not be collected as the newspapers do not usually report these. These data were collected daily by one of the authors (AM) from 2 January 2002 to 7 January 2003, and were randomly cross-verified by the other (RD). Newspapers for the first week of January 2003 were reviewed to document deaths of people who were injured in the last week of December 2002. Newspapers were not published for 5 days in that year, due to festival holidays. The data were then entered in a Microsoft-Access database.

We did not attempt to document the extent to which the reported cases were the same in both the data sources, as the limited detail available would have made this task difficult. Data were analysed using SPSS software (SPSS for Windows, Rel.10.0.5. 1999. Chicago: SPSS Inc.).

RESULTS

A total of 3039 cases of road traffic crashes were recorded in the police database from 1 January to 31 December 2002. Four hundred and eleven people were killed in 400 of the 3039 crashes (13.2%). Among the crashes that were fatal, 1 person was killed in each of 391 crashes (97.8%), 2 in each of 8 crashes (2%), and 4 in 1 crash (0.2%). For the same period, 316 cases of road traffic crashes resulting in 353 deaths were reported in the newspaper. One person had died in each of 289 cases (91.5%), 2 persons in each of 19 (6%), 3 persons in each of 6 (1.9%), and 4 persons in each of 2 (0.6%). The results are presented for variables available from the two data sources.

Age and sex

The age and sex of the persons killed in the road traffic crashes are shown in Fig. 1 for both sources of data. The majority of those who died due to these crashes were males in both the data sources. Of all the persons killed, 70% were between 16 and 49 years of age, with 31.6% and 36.8% between 16 and 29 years of age in the police database and newspaper reports, respectively.

Vehicles involved

Tables I and II show the types of vehicles of the victims and 'accused' involved in the road traffic crashes that resulted in deaths in the year 2002 according to the police database and the newspaper. These data suggest that pedestrians and riders of two-wheelers were the main victims in road traffic crashes. On the other hand, truck and lorry type of vehicles, and buses accounted for the majority of 'accused' vehicles in these crashes. 'None' (no other vehicle involvement) as a category was reported only by the newspaper.

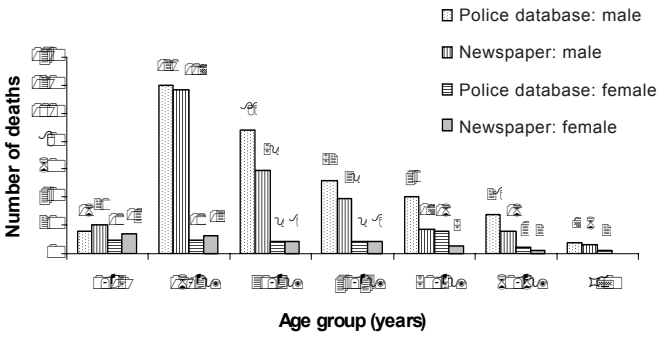


FIG 1. Age and sex distribution of the persons killed in road traffic crashes in 2002 according to two data sources. Data on age and sex were not available for 29 victims reported in the newspaper.

TABLE I. Details of the vehicles of victims involved in road traffic crashes that resulted in death in 2002 according to two data sources

Type of vehicle	Police database (*n*=400)	Newspaper (*n*=316)
Cycle*	37 (9.3)	17 (5.4)
Motorized two-wheeler†	127 (31.8)	122 (38.6)
Car, jeep	4 (1)	12 (3.8)
Truck, lorry type‡	4 (1)	24 (7.6)
Bus	1 (0.3)	3 (0.9)
Auto-rickshaw, 7-seater§	17 (4.3)	26 (8.2)
Pedestrian	161 (40.3)	78 (24.7)
Others	48 (12)	0
Not known	1 (0.3)	34 (10.8)

Values in parentheses are percentages * Non-motorized two-wheeler
† Motorbikes, scooters and mopeds ‡ Heavy vehicles meant for carrying load
§ Auto-rickshaws and seven-seaters are motorized three-wheelers for carrying 3 and 7 passengers, respectively

TABLE II. Details of the 'accused' vehicles involved in the road traffic crashes that resulted in death in 2002 according to two data sources

Type of vehicle	Police database (*n*=400)	Newspaper (*n*=316)
Cycle*	1 (0.3)	1 (0.3)
Motorized two-wheelers†	78 (19.5)	19 (6)
Car, jeep	44 (11)	22 (7)
Truck, lorry type‡	134 (33.5)	140 (44.3)
Bus	63 (15.8)	42 (13.3)
Auto-rickshaw, 7-seater§	30 (7.5)	11 (3.5)
Others	0	31 (9.8)
None	0	42 (13.3)
Not known	50 (12.5)	8 (2.5)

Values in parentheses are percentages. * Non-motorized two-wheeler
† Motorbikes, scooters and mopeds ‡ Heavy vehicles meant for carrying load
§ Auto-rickshaws and seven-seaters are motorized three-wheelers for carrying 3 and 7 passengers, respectively

TABLE III. Distribution of vehicles involved in road traffic crashes for different age groups of the victims (n=411) according to the police database for 2002

Vehicle	Age group (years)							
	0–15	16–29	30–39	40–49	50–59	60–69	>70	Total
Cycle*	4 (10.8)	6 (16.2)	8 (21.6)	3 (8.1)	10 (27)	6 (16.2)	0	37
Motorized two-wheeler†	2 (1.5)	58 (43.6)	41 (30.8)	19 (14.3)	9 (6.8)	4 (3)	0	133
Car, jeep	1 (20)	2 (40)	0	1 (20)	1 (20)	0	0	5
Truck, lorry‡	0	1 (25)	1 (25)	1 (25)	1 (25)	0	0	4
Bus	0	0	0	0	1 (100)	0	0	1
Auto-rickshaw, seven-seater§	0	10 (55.6)	3 (16.7)	2 (11.1)	0	3 (16.7)	0	18
Pedestrian	17 (10.4)	33 (20.2)	26 (15.8)	30 (18.2)	32 (19.5)	17 (10.4)	9 (5.5)	164
Not available	3 (6.1)	20 (40.8)	17 (34.7)	5 (10.2)	2 (4.8)	2 (4.8)	0	49

Values in parentheses are percentages * Non-motorized two-wheeler † Motorbikes, scooters and mopeds ‡ Heavy vehicles meant for carrying load § Auto-rickshaws and seven-seaters are motorized three-wheelers for carrying 3 and 7 passengers, respectively

TABLE IV. Distribution of vehicles for different age groups of the victims (n=353) according to the newspaper for 2002. Data on age were not available for 29 persons

Vehicle	Age group (years)							
	0–15	16–29	30–39	40–49	50–59	60–69	³70	Total
Cycle*	6 (35.3)	3 (17.6)	0	3 (17.6)	0	4 (23.5)	0	17
Motorized two- wheeler†	5 (3.9)	65 (50.4)	30 (23.3)	13 (10.1)	10 (7.8)	1 (0.8)	0	129
Car, jeep	2 (10.5)	7 (36.8)	3 (15.8)	1 (5.3)	1 (5.3)	0	0	19
Truck, lorry‡	0	17 (53.1)	8 (25)	3 (9.4)	1 (3.1)	2 (6.3)	0	32
Bus	0	2 (40)	2 (40)	1 (20)	0	0	0	5
Auto-rickshaw, seven-seater§	1 (2.7)	9 (24.3)	10 (27)	5 (13.5)	0	2 (5.4)	0	37
Pedestrian	18 (22.5)	19 (23.8)	6 (7.5)	14 (17.5)	6 (7.5)	8 (10)	4 (5)	80
Not available	2 (5.9)	8 (23.5)	8 (23.5)	7 (20.6)	4 (11.8)	1 (2.9)	2 (5.9)	34

Values in parentheses are percentages * Non-motorized two-wheeler † Motorbikes, scooters and mopeds ‡ Heavy vehicles meant for carrying load § Auto-rickshaws and seven-seaters are motorized three-wheelers for carrying 3 and 7 passengers, respectively

According to the police database, among the two-wheeler riders who were killed, 45.3% were killed in a crash with truck and lorry type of vehicles, and 22.3% in a crash with buses. On the other hand, according to the newspaper, 79% of the two-wheeler riders were killed in a crash with truck and lorry type of vehicles, and 15% in a crash with buses. Among the pedestrians, 26.4% and 42.3% were killed in a crash with truck and lorry type of vehicles, according to the police database and newspaper, respectively.

Tables III and IV show the distribution of vehicles for the different age groups of the victims for the police database and newspaper, respectively. In both data sources, the majority of victims between 16 and 39 years of age were riding a motorized two-wheeler, and a majority of those >60 years of age were pedestrians.

The proportion of males who were killed in a road crash while riding a motorized two-wheeler was 34.8% according to the police database, and 41.2% according to the newspaper (Fig. 2). Both sources reported that the majority of female victims were pedestrians followed by riders of a motorized two-wheeler.

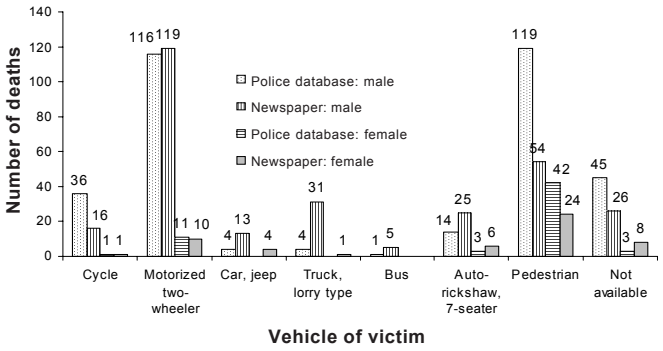


FIG 2. Distribution of vehicles for the victims who were killed in road traffic crashes in 2002 for the two sexes according to two data sources

Nature of the crash

The nature of all road traffic crashes was recorded as 'head-on collision' in the police database. Figure 3 shows the details reported for the crashes in the newspaper. Data were not available for 1 crash, and 13.6% of all the crashes were due to reasons other than collision with a vehicle. 'Fell down' included crash events wherein the victim fell either from a moving vehicle or while attempting to get into a vehicle, and 'collision with a non-moving object' included hitting a tree, road divider, wall and electricity pole while riding a vehicle. 'Fell down' was the most common nature of crash recorded for victims who were travelling in a bus

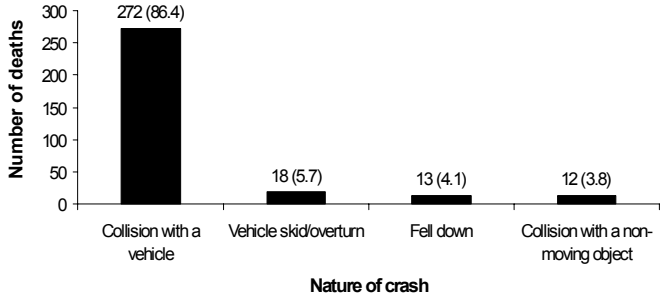


FIG 3. Nature of crash reported by the newspaper for the 316 road crashes in which 353 persons were killed in 2002. Data were not available for 1 crash (values in parentheses are percentages)

TABLE V. Distribution of nature of crash for the vehicles of victims according to the *Deccan Chronicle* data for 2002

Vehicle	Nature of crash (*n*=316)					
	Collision with a vehicle	Skid/ overturn	Fell down	Collision with non-moving object	Not available	Total
Cycle*	17 (100)	0	0	0	0	17
Motorized two-wheeler†	103 (84.4)	11 (9)	4 (3.3)	3 (25)	1 (0.8)	122
Car, jeep	9 (75)	0	0	3 (25)	0	12
Truck, lorry‡	11 (45.8)	3 (12.5)	5 (20.8)	5 (20.8)	0	24
Bus	1 (33.3)	0	2 (66.7)	0	0	3
Auto-rickshaw, seven-seater§	21 (80.8)	4 (15.4)	0	0	1 (3.8)	26
Pedestrian	77 (98.7)	0	1 (1.3)	0	0	78
Not available	33 (97.1)	0	1 (2.9)	0	0	34

Values in parentheses are percentages * Non-motorized two-wheeler † Motorbikes, scooters, luna and mopeds ‡ Heavy vehicles meant for carrying load § Auto-rickshaws and seven-seaters are motorized three-wheelers for carrying 3 and 7 passengers, respectively

as they died because of falling down, either while boarding or getting down from the bus (Table V).

Cause of the crash

'Negligence of the driver' was recorded as the cause of crash for all road traffic crashes in the police database. No mention of the driver's behaviour was made in any newspaper report.

Time of death

In the police database, all the deaths were recorded as 'spot dead'. According to the newspaper, only half of the victims had died on the spot (Fig. 4).

Injured

A total of 3116 people were injured, but survived a road crash according to the police database.

DISCUSSION

We analysed the data on deaths due to road traffic crashes in Hyderabad in 2002 from two sources—the police database and newspaper reports. The police is empowered by the state governments of the Indian states to make an investigation if it is reported to them that a person has been killed by an *accident* in accordance with the Code of Criminal Procedure.[8] Therefore, once a death in a road traffic *accident* is reported to the police, it is documented in the police database. The newspaper, as expected, reported only those cases of road crashes that had resulted in fatality as these cases make news. We discuss the extent of information about road traffic crash fatalities available from these two data sources, which are relatively easily available in the public domain, its utility for road crash surveillance, and identify the gaps in information and make recommendations for strengthening surveillance.

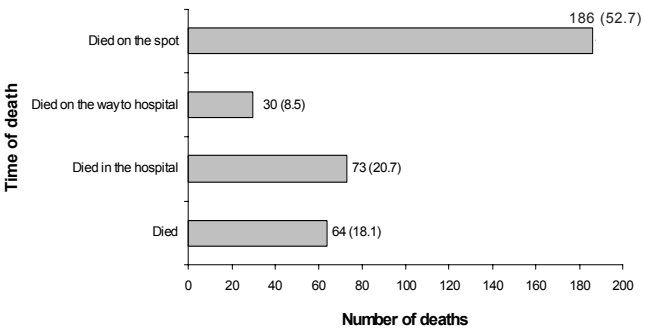


FIG 4. Time of death reported by the newspaper for the 353 persons who were killed in road crashes in 2002 (values in parentheses are percentages)

'Surveillance' refers to the ongoing and systematic collection, analysis and interpretation of health data essential to planning, implementation and evaluation of health practice, closely integrated with the timely dissemination of these data to those who need to know.[9] In other words, to plan a healthcare system that makes the best use of available resources to address the problem of fatalities and injuries due to road traffic crashes, four questions are important for a planner: what is the problem, what is the cause, what works and how can it work.[10] A good road traffic crash injury surveillance system can provide answers to the first two questions and can help to answer the other two. How the first two questions for good surveillance are answered by these two data sources is discussed.

What is the problem?

To understand the problem, we need to know how many people are killed in road traffic crashes and who these people are.

Magnitude. Hyderabad, with a population of 5.5 million, had an estimated 1.2 million motor vehicles in 2002.[11] A total of 3039 road crashes were recorded in the police database for 2002, of which 400 crashes resulted in 411 deaths. In other words, there were 8.3 road traffic crashes and 1 death in these crashes per day in Hyderabad. The rate of deaths per 100 cases of road crashes for the city was 13.5 in 2002. The newspaper reported 353 deaths for the same period, which is fewer than that reported in the police database.

The data on 'accidental deaths and suicides' in India are recorded by the National Crimes Record Bureau (NCRB), which functions under the Ministry of Home Affairs, Government of India. These statistics are obtained from the police departments of various states in the country. According to the NCRB report, 76 732 people were killed in road traffic crashes in 1998 in India.[3] However, for the same year, WHO reported that an estimated 217 000 people were killed in road crashes in India.[1] These data highlight a difference of 2.8 times between the two reports. The main reason for this difference in the estimates is the use of different data sources. Police records are the source of data for the NCRB report. On the other hand, WHO estimates are based on an update of the original analysis in the 1990 Global Burden of Disease Study, which used the medical certificate of cause of death (registered deaths) from the Sample Registration System in the state of Maharashtra.[12]

Victims. Data from both the police database and newspaper

show that 70% of those killed in road crashes were between 16 and 49 years of age; 61% if those 15–44 years of age are considered. A review of several published studies from developing countries showed that young adults (15–44 years of age) account for 48%–78% of all road crash fatalities and injuries.[13] From the WHO database, it is estimated that up to 70% of the total years of life lost due to road traffic injuries is accounted for by this age group.[14] Clearly, death in this economically productive age group results in a huge economic burden on the society. The direct costs of road crashes are estimated at 1%–2% of the gross national product annually in the low- and middle-income countries.[15]

More than 80% of those killed in road crashes were males in both the data sources. The review by Odero *et al.* also showed that males outnumbered females among those who were killed in road crashes, possibly because males have a higher exposure to road traffic compared to females due to economic opportunities.[13]

According to both the data sources, riders of two-wheelers and pedestrians were the most vulnerable group in road crashes. A little over 40% of those killed were riders of two-wheelers according to both the data sources. If one were to include people whose mode of transport was bus, auto-rickshaw or seven-seater in the category of pedestrians, as these people also walk on the road to use these public transport vehicles, then the proportion of pedestrians killed was 44.9% and 33.8% in the police database and newspaper, respectively. There was a notable difference in the proportion of deaths in this category between the two data sources. Competing for space with faster moving motor vehicles on the same road makes these groups more vulnerable to road crashes.[16–18]

What is the cause?

The newspaper was the better source of information for data on how these people were killed because in the police database all the crashes were recorded as 'head-on collision'. Nearly 87% of all crashes were the result of collision with a vehicle. However, there are no data to suggest the possible reasons for these collisions. More than 80% of the riders of motorized two-wheelers, auto-rickshaws and seven-seaters, and pedestrians were killed due to collision with a vehicle. These vehicles were mainly truck and lorry type of vehicles, and buses. Another 10% of the crashes could possibly be attributed to the 'physical environment'.

Data on the time of death are important in planning emergency trauma care. The newspaper data, to an extent, could assist in providing some information because every victim was recorded as 'spot dead' in the police database. Nearly half the victims died on the spot after the road crash, and data for the time of death for 18% were not available. The data suggest that 30% of the victims died on the way to, or in, the hospital. There is no information available on how these people were transported to the hospital, whether an ambulance service was available, and how long after reaching/being admitted to the hospital these people died. This kind of information is important in planning emergency medical services.

However, the above has to be viewed against the background that the chances of cases with 'collision with a vehicle' or 'spot dead' being reported to the police is higher, as these are linked to compensation and insurance claims for which police documents are necessary.

Utility of these data for surveillance

Despite the gaps in reporting of fatalities in road traffic crashes in these data sources, they provide insights into the magnitude and nature of deaths resulting from road crashes in the city. These two data sources are complementary to each other. On the one hand, whereas the police database has a larger number of cases recorded with more details of where the crash happened, the newspaper reports are more descriptive in nature addressing issues related to the nature of the crash, cause of the crash and time of death. These data clearly suggest that males, people in their productive years, pedestrians and those riding two-wheelers are the most frequent victims on the roads of Hyderabad, and that 60% of them die before reaching the hospital—information that can be used to plan interventions to reduce fatalities from road traffic crashes in the city.

Limitations of these data

These data also highlight that there is a need to strengthen surveillance. The data currently available do not give the true magnitude of the burden due to road traffic crashes as there could be underreporting; reliability of these data needs strengthening as discrepancies were noticed between the two data sources; and these data are not comprehensive enough to plan proper intervention strategies to reduce fatalities and injuries due to road crashes. As it cannot be expected that the newspapers would cover all the above because it is not their prime responsibility, we focus on the police database for recommendations as it is the legal source of information on fatalities and injuries due to road crashes.

Strengthening surveillance

It is important to know the correct number of people killed in road traffic crashes to understand the real burden of road crashes. It is possible that some cases of road traffic crash deaths are not reported to the police. The possible reasons for this could be suboptimal coordination between the police and hospitals in the event of death occurring in hospitals due to a road crash; not all deaths are reported to police by the public; and because not all deaths related to road traffic crashes occur in hospitals. It is also possible that someone who was recorded as 'injured in road traffic crash' in the police database died at a later date but this is not reflected in the police database, which can result in underreporting of deaths due to road traffic crashes. A proper data collection mechanism with involvement of all the major stakeholders on whom this data collection depends needs to be put in place, including regular updating of the police database to understand the real burden of road crashes.

There is also a need to extend the coverage of data on road traffic crashes collected by the police to include all the factors needed to assess the true nature of road crashes. The reporting of road crashes is not adequate as the physical environment at the time of the crash, status of the people involved (alcohol or drug use and behaviour), use of protective gear for two-wheeler riders (helmet), condition of the vehicles involved in the crash are not covered in the police database. All this information is important to have a comprehensive understanding of the nature of road crashes, and plan and evaluate proper intervention strategies. Injury surveillance guidelines to develop surveillance systems in settings with scarce resources are available from WHO and the US Centers for Disease Control,[9,10] and could be used as an initial step to substantiate the content of the police database, and then adapted and modified according to local needs.

The reliability and accuracy of the data collected are also important. For example, in the police database the nature of crash was recorded as 'head-on collision', and the cause of crash as 'negligence of driver' for all the road crashes that resulted in death. We explored the reasons for this documentation. The office of the

DCP received these data from various police stations around the city. Many of the forms received did not have 'nature of crash' filled, and it was assumed to be 'head-on collision'. Second, recording of the cause of crash as 'negligence of driver' in the police report did not require any proceedings in a court of law, and thereby served to reduce the administrative burden, as the resources available with the police are limited. However, these reasons have to be seen within the administrative context of the police department. Currently, the Traffic Police Department is responsible for road safety but the investigation of a road crash is done by the law and order police and not by the traffic police. The traffic police only maintains the database related to road crashes. In other words, the traffic police is responsible for traffic safety but not for investigating mishaps that occur due to traffic. To improve the reliability and accuracy of data on road crashes, it is important that the administrative body responsible for maintaining traffic safety is also responsible for road crash-related investigations.

In conclusion, the police database and newspaper reports provide insights into the magnitude and nature of fatalities due to road traffic crashes. The limitations of the police database, which is the legal source of information on fatalities resulting from road traffic crashes, indicate a need for strengthening the road traffic crash surveillance system so that reliable, accurate and adequate data on road traffic crashes and the resulting fatalities and injuries can be collected. This could then form the basis for planning effective intervention strategies to improve road safety in the city. More effort is needed to have a comprehensive understanding of the various aspects of road traffic crashes, and the recommendations made for strengthening surveillance could serve as an initial step towards reducing fatalities and injuries due to road crashes in the long term. The Administrative Staff College of India, Hyderabad and the Traffic Police of Hyderabad have started working together towards this objective.

ACKNOWLEDGEMENTS

We thank Mr K. Sreenivasa Reddy, Deputy Commissioner of Police, Hyderabad Traffic Police, Government of Andhra Pradesh for providing access to the Department of Police database for road traffic injuries, and Mr S. Radhakrishnan for designing the database for data entry.

REFERENCES

1 Krug E (ed). *Injury: A leading cause of the global burden of disease*. Geneva:World Health Organization; 1999.
2 Murray CJL, Lopez AD, Mathers CD, Stein C. *The Global Burden of Disease 2000 Project: Aims, methods, and data sources (revised). Global Program on Evidence for Health Policy Discussion Paper No. 36*. Geneva:World Health Organization; 2001.
3 National Crimes Records Bureau. *Accidental deaths and suicides in India—1999*. New Delhi:Ministry of Home Affairs, Government of India; 2001.
4 Kapp C. WHO acts on road safety to reverse accident trends. *Lancet* 2003;**362:**1125.
5 Nantulya VM, Sleet DA, Reich MR, Rosenberg M, Peden M, Waxweiler R. Introduction: The global challenge of road traffic injuries: Can we achieve equity in safety*? Inj Control Saf Promot* 2003;**10:**3–7.
6 Mohan D. Road traffic injuries—a neglected pandemic. *Bull World Health Organ* 2003;**81:**684–5.
7 Registrar General of India. *Population totals: India, Census of India 2001*. New Delhi:Ministry of Home Affairs, Government of India; 2001. *http://www.censusindia.net* (accessed October 2003).
8 Government of India. *Code of Criminal Procedure—1973*. New Delhi:Ministry of Home Affairs, Government of India; 1973.
9 Centers for Disease Control. *CDC Surveillance Update*. Atlanta:Centers for Disease Control and Prevention; 1988.
10 Holder Y, Peden M, Krug E, Lund J, Gururaj G, Kobusingye O (eds). *Injury surveillance guidelines*. Geneva:World Health Organization; 2001.
11 Joint Transport Commissioner and Secretary. *Vehicles registered in twin cities*. Hyderabad:Government of Andhra Pradesh; 2003. *http://www.aptransport.org* (accessed October 2003).
12 World Health Organization. *The World Health Report 1999: Making a difference*. Geneva:World Health Organization; 1999.
13 Odero W, Garner P, Zwi A. Road traffic injuries in developing countries: A comprehensive review of epidemiological studies. *Trop Med Int Health* 1997;**2:** 445–60.
14 Krug EG, Sharma GK, Lozano R. The global burden of injuries. *Am J Public Health* 2000;**90:**523–6.
15 Jacobs G, Aaron-Thomas A, Astrop A. *Estimating global road fatalities*. TRL Report 445. London:Transport Research Laboratory; 2000.
16 Nantulya VM, Reich MR. The neglected epidemic: Road traffic injuries in developing countries. *BMJ* 2002;**324:**1139–41.
17 Afukaar FK, Antwi P, Ofosu-Amaah S. Pattern of road traffic injuries in Ghana: Implications for control. *Inj Control Saf Promot* 2003;**10:**69–76.
18 Odero W, Khayesi M, Heda PM. Road traffic injuries in Kenya: Magnitude, cases and status of intervention. *Inj Control Saf Promot* 2003;**10:**53–61.

The National Medical Journal of India

Fellowship Programme

Applications are invited from undergraduates and postgraduates in the Health Sciences for a 6 month ***Fellowship Programme*** in the art and science of publishing journals in the health sciences starting 1 June 2004. The fellow would be expected to work full-time in the editorial office of *The National Medical Journal of India* and to do a brief research study during his/her tenure. A fellowship allowance of Rs 10 000 per month (all inclusive) would be offered. Interested candidates should apply with their curriculum vitae along with a 1000 word write-up on how she/he expects to benefit from this programme and her/his future plans. Applications should be received in the Office of the *The National Medical Journal of India*, All India Institute of Medical Sciences, Ansari Nagar, New Delhi 110029, latest by 1 **May 2004**.