Original Articles

Making road safety a public health concern for policy-makers in India

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ABSTRACT

Background. Road traffic injuries contribute substantially to the disease burden in India. This paper describes the road safety issues discussed by members of the Indian Parliament, and highlights the gaps that need to be addressed to make road safety visible as a public health problem to policy-makers in India.

Methods. All questions asked to and information provided by the Ministry of Road Transport and Highways, and questions relating to *accident* asked to the Ministry of Health and Family Welfare of the Government of India were reviewed for the two Houses of the Indian Parliament for the years 2002 to 2004.

Results. Of the 1529 questions asked to the Ministry of Road Transport and Highways, only 140 (9.1%) were related to road safety, whereas 1076 (70.5%), 181 (11.8%), 51 (3.3%) and 81 (5.3%) were related to other aspects of the national highways, state roads, vehicles and other issues, respectively. Data on the magnitude of road crashes dealt only with the number of crashes and fatalities and not with the age, sex and type of road users affected by road traffic injuries. The parliamentarians were informed that human error was the main cause of road crashes in India; however, the robustness of this information is questionable. Strategies to prevent road crashes focused mainly on training of drivers with little attention to other factors that cause road crashes. The discussion on legislations also focused on drivers, ignoring other road users. Ten of the 4741 questions (0.2%) asked to Ministry of Health and Family Welfare were related to accident, the majority of which were about the setting up of trauma care services.

Conclusion. An appropriate policy and intervention response by policy-makers is not possible with data that are presented in a manner that do not highlight the true nature of the problem, and are neither comprehensive nor robust. Majority of the proposed road safety interventions by the Ministry of Road Transport and Highways are based on the traditional view of human error as a major cause of road crashes highlighting the lack of a scientific public health approach towards prevention of road crashes. It would be useful to build the technical capacity of the Ministry of Road Transport and Highways in road safety to use the available data more effectively, and to facilitate generation of further relevant data about the magnitude, underlying causes and impact of road traffic injuries, for policy-makers to better understand the critical issues for planning effective road safety policies and interventions to reduce the high burden of mortality and morbidity due to road crashes in India.

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INTRODUCTION

Road traffic injuries (RTI) are a major public health problem, especially in low- and middle-income countries, with an estimated 1.2 million people killed and 50 million injured in road crashes worldwide each year.[1] RTI are projected to become the third leading cause of disability-adjusted life years lost globally if the current trend continues.[2] The *World report on road traffic injury prevention* clearly indicates the urgent need for governments and other key players to increase and sustain action to prevent RTI. It recommends that governments make road safety a political priority by assessing the current status of road safety in their countries, reviewing relevant policies, institutional arrangements and capacity, and taking appropriate actions.[1]

An estimated 82 700 people died and 404 800 were injured in road traffic crashes in India in the year 2002.[3] In India, in 1998 RTI were the ninth leading cause of burden of disease and the third leading cause of death among people between 5 and 44 years of age.[4] Clearly, death in the economically productive age group results in a huge economic burden to society.[5] Even though RTI are estimated to constitute 3.5% of the total disease burden in India, only 0.1% of all health research published from India and included in PubMed in 2002 related to RTI.[6] Pedestrians, motorcyclists and cyclists are affected the most by RTI in India because affordable transport poses a higher risk of RTI than private car use,[7,8] as in many other developing countries.[1,9–12]

Road safety in India is the responsibility of the Ministry of Road Transport and Highways (MoRTH) and the Police Department, with the role of the Ministry of Health and Family Welfare (MoHFW) being limited to provision of trauma care

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following road crashes.[13,14] The government is one of the key players in road safety as it is responsible for formulating road safety policies and legislations, and implementing these. There is evidence that effective road safety policies can arise out of the efforts of informed and committed members of Parliament.[15] The aim of this paper is to describe the road safety issues discussed by members of the Indian Parliament, and to highlight the gaps that need to be addressed to make road safety visible to policy-makers as a public health problem that is commensurate with the burden of RTI in India.

METHODS

Background of the Indian Parliament[16]

The Indian Parliament consists of a bicameral legislature, the *Lok Sabha* (House of the People or the lower house) and the *Rajya Sabha* (Council of States or the upper house). The principal function of Parliament is to pass laws on matters that the Constitution specifies to be within its jurisdiction. Members of the *Lok Sabha* are elected directly by the people through universal adult franchise, and represent the people with the total effective membership distributed among the states. Members of the *Rajya Sabha* are elected by elected members of the Assemblies of the States and Union Territories in accordance with the system of proportional representation, and the President of India nominates a few members.

Question hour (QH) is the first hour of any session of the *Lok Sabha* and *Rajya Sabha* that is devoted to questions asked by members to the government. A question is primarily asked for the purpose of obtaining information on matters of public importance and various criteria are followed for the questions to be admitted in a house for answer. The members can ask questions on any aspect of administration and governmental activity, and government policies come into sharp focus as the members try to elicit pertinent information during the QH. Through the QH, the government has the opportunity to remain in touch with the people, as parliamentarians can put forward the grievances of the public regarding matters concerning administration. This provides an opportunity to the government to adapt its policies and actions as needed. In certain cases, questions may lead to the appointment of a commission, a court of inquiry or even legislation when the matters raised are grave enough to agitate the public and are of wider public importance.

Data collection and analysis

The questions admitted to the *Lok Sabha* and *Rajya Sabha* during QH are available on the respective websites of the Indian Parliament.[17,18] Questions for the MoRTH were searched for all the sittings of the two houses for the years 2002, 2003 and 2004 (available for February–December 2004 for the *Lok Sabha* and for July–December 2004 for the *Rajya Sabha*). No records of questions for the MoRTH were found on the Indian Parliament website for the year 2005. Each question and its answer were then downloaded for review, following which the questions were classified into 5 categories as summarized below:

1. Road safety: relating to any aspect of road safety
2. National highway: relating to any aspect of the national highways and national border roads other than road safety
3. State roads: relating to all aspects of state highways other than road safety
4. Vehicle: relating to vehicle registration and pollution norms
5. Others: could not be classified under any of the above

In order to understand the various issues related to road safety that were discussed by parliamentarians, the questions under road safety were further classified into those relating to the magnitude, causes and prevention of road crashes, and legislation relating to road crashes.

In addition, questions for the MoHFW were also searched for all the sessions of the two Houses of Parliament for the years 2002, 2003 and 2004. For this search, accident, trauma, emergency and road accident were used as key words. These questions and their answers were downloaded and reviewed to assess the issues related to road safety raised for the MoHFW.

RESULTS

A total of 431, 328 and 167 questions in the *Lok Sabha*, and 281, 262 and 60 questions in the *Rajya Sabha* were asked to the MoRTH in the years 2002, 2003 and 2004, respectively. The distribution for the different categories of questions in the two Houses is shown in Table I. Questions related to the national highways were predominant in both the Houses in all the 3 years. Overall, the proportion of questions on road safety was small (140; 9.1%), it was slightly higher in the *Rajya Sabha* than the *Lok Sabha*.

On reviewing these questions, it was found that some of them had sub-questions that covered a different aspect of road safety than the one in the main question. In order to capture all the issues raised in these questions, such sub-questions were treated as separate questions for detailed analysis of road safety questions. Therefore, a total of 196 questions related to road safety were available for further analysis (Fig. 1). The various issues raised/discussed under each category of road safety questions are listed in Table II, and the information provided to the two Houses under each category of road safety question is summarized below.

Magnitude of road crashes

Of the 196 questions on road safety, 53 (27%) were on the

TABLE I. Distribution of the various categories of questions asked to the Ministry of Road Transport and Highways, Government of India in the two Houses of Parliament for the years 2002, 2003 and 2004

Questions related to	*Lok Sabha*			*Rajya Sabha*			Total
	2002	2003	2004*	2002	2003	2004*	
National highway	335 (77.7)	241 (73.5)	104 (62.3)	178 (63.3)	181 (69.1)	37 (61.7)	1076 (70.5)
Road safety	25 (5.8)	26 (7.9)	15 (9.0)	34 (12.1)	32 (12.2)	8 (13.3)	140 (9.1)
State roads	35 (8.1)	36 (11)	31 (18.5)	38 (13.5)	30 (11.5)	11 (18.3)	181 (11.8)
Vehicle	9 (2.1)	12 (3.7)	3 (1.8)	12 (4.3)	14 (5.3)	1 (1.7)	51 (3.3)
Others	27 (6.3)	13 (4)	14 (8.4)	19 (6.8)	5 (1.9)	3 (5)	81 (5.3)
Total	431 (100)	328 (100)	167 (100)	281 (100)	262 (100)	60 (100)	1529 (100)

*Data available only for Parliament sessions held from February to December 2004 for *Lok Sabha* and July to December 2004 for *Rajya Sabha*. Values in parentheses are percentages.

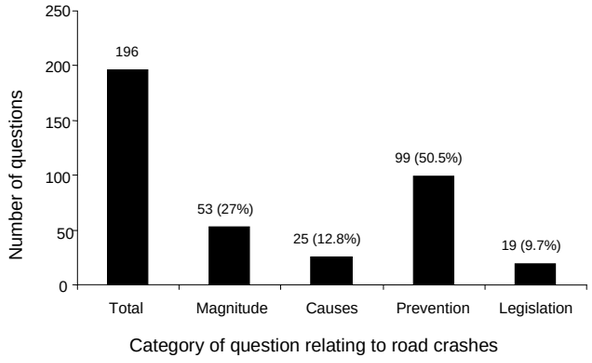


FIG 1. Distribution of the various categories of questions on road safety in the two Houses of the Indian Parliament for the years 2002, 2003 and 2004

TABLE II. Summary of the issues raised/discussed in the two Houses of Parliament under different categories of road safety in the years 2002, 2003 and 2004

Category of road safety	Issues raised/discussed
Magnitude of road crashes	• Number of road crashes on national highways and in the country • Number of people killed in road crashes on national highways • Number of road crashes per 1000 vehicles in the country • Social cost of road crashes
Causes of road crashes	• Various causes of road crashes • Human factor as the most important cause of road crashes • Non-availability of data on environmental factors as a cause of road crashes
Prevention of road crashes	• Steps taken by the Ministry to prevent road crashes • Recommendations made by various committees • Development of a manual for safety in road design • Participation of non-governmental organizations in road safety • Funds allocated and available for road safety activities from the Ministry • Establishment of a National Road Safety Council
Legislations related to road safety	• For driving under the influence of alcohol • Provision of non-bailable warrant for drivers responsible for the death of a person in a road crash • For controlling transportation of hazardous material • For a smooth transport system on the highways • Need for better procedures for driving license • Revision of vehicle safety standards

magnitude of road crashes in both the Houses combined. Of these 53 questions, 18 (34%) were related to magnitude for the country as a whole, 14 (26.4%) for national highways, 11 (20.7%) for state highways, 3 (5.7%) for states, 2 (3.8%) for cities, and 5 (9.4%) for other aspects of magnitude. The details of crashes on the national highways provided to both the

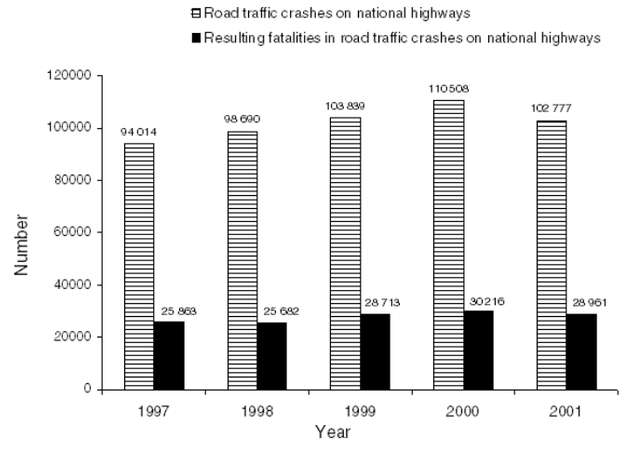


FIG 2. Distribution of road traffic crashes and the resulting fatalities on the national highways in India from 1997 to 2001 reported in the Indian Parliament

Houses are shown in Fig. 2. It was reported that there were 9.31, 8.61, 8.09, 7.37 and 6.83 road crashes per 1000 vehicles from 1998 to 2002, respectively, in India; however, the total number of road crashes had increased over the years due to the increasing number of motor vehicles on the road. The numbers of people killed in the country in road crashes were 79 000, 81 000, and 83 000 whereas the numbers of people injured were 399 000, 404 000 and 405 000 in the years 2000, 2001 and 2002, respectively.

The Working Group on road safety set up by the Government of India in 2000 had estimated the annual economic cost of road crashes at Indian Rupees (Rs) 550 billion (US$ 13 billion), and the social cost at 3% of the gross domestic product for 1999–2000 in India. In response to another question, the MoRTH confirmed that it was aware of the report on injuries published by the Southeast Asia Regional Office (SEARO) of WHO.[19]

Causes of road crashes

Of the 196 questions on road safety asked in both Houses, 25 (12.8%) were related to causes of road crashes. The members were informed that 83.5% of crashes in the country were due to the fault of drivers, 2.4% due to the fault of passengers, 2.3% due to the fault of pedestrians, 3% due to a mechanical fault in the vehicles, 1.1% due to bad roads, 0.9% due to bad weather and 6.8% were due to other factors. Human factors as the cause of crashes included lack of traffic discipline on the part of road users, overspeeding, overloading of vehicles and driving under the influence of alcohol. In response to a question on hoardings as a cause of road crashes (causing drivers to be distracted), the MoRTH informed that such data were not available and added that no hoardings are allowed on national highways. Data on road intersections, trees, absence of central median (divider) on the highways, and use of alcohol by drivers, and various types of vehicles as causes of road crashes were not available with the MoRTH. A few questions were related to causes of accidents on some specific national highways.

Prevention of road crashes

Of the 196 questions on road safety in both the Houses in the 3 years, 99 (50.5%) were related to the prevention of road crashes. The members were informed that a National Road

TABLE III. Summary of the steps proposed/taken to prevent road crashes raised/discussed in the two Houses of the Indian Parliament in the years 2002, 2003 and 2004

In relation to	Steps proposed/taken to prevent road traffic crashes
Drivers	• Minimum educational qualification • Minimum experience of 3–4 years of driving a light motor vehicle and a fixed upper age limit for issuing driver's licence for heavy vehicles • Provision of assistance for Driver Training Schools and for refresher training of heavy motor vehicle drivers • Every driving licence to have a unique identifier, including fingerprint of the driver
Vehicles	• Tighten fitness norms for transport vehicles • Improve design of trucks and buses to reduce harm in road crashes • Fit reflectors on vehicles in rural areas • Improve readability of vehicle registration numbers
Road	• Remove encroachment • Widen and improve roads • Better design of highways • Use of thermo-plastic road markings • Augmentation of retro-reflective signage
Traffic law enforcement	• Enhance penalty for traffic violations, especially for drunken driving • Tackle overloading of vehicles • Fit speed governors in vehicles • Use interceptors to check traffic violations • Mandatory use of fog lights in bad weather • Computerize data on drivers' license and vehicle registration • A highway patrol management model to control road crashes
Emergency care	• Extend scheme for provision of ambulances • Trauma care centres to be available at every 50 km on national highways • Aid post to be available at every 100 km on state highways • Remove liquor shops from national highways
Publicity	• Undertake campaigns on road safety • Provide grants to voluntary organizations for road safety programmes • Institute a national award for voluntary organization/individuals for outstanding work in road safety • Institute award for State Transport Undertakings with the lowest accident record • Observe a Road Safety Week across the country
Others	• *Manual for safety in road design* developed based on road safety practices in India and other countries • *Highway safety code* detailing the safety measures for road users developed • Road safety education to be a subject at school level • Encourage non-governmental organizations involved in the area of road safety • Increase the budget for road safety • Establish a branch of the Central Institute for Road Transport, Pune • Constitute a Road Safety Cell in every district • Set up an All India Road Safety Research Centre

Safety Council (NRSC) had been appointed by the government with the Minister heading the MoRTH as its Chairman, and that it had endorsed a National Road Safety Policy in December 1994. The steps taken by the MoRTH and those proposed by the NRSC and other committees to prevent road crashes are summarized in Table III.

The members were informed that Rs 245.5 million (US$ 5.4 million) had been allocated for road safety in various Indian states in 2002–03, and that the road safety budget in 2002–03 was increased to Rs 300 million (US$ 6.7 million) from Rs 103 million (US$ 2.3 million) in 2001–02. The MoRTH had provided Rs 13 million to set up the Central Institute for Road Transport, Pune which is a centre of excellence on road safety, and had also provided funds for setting up Driver Training Institutes in some states. However, it was pointed out that the MoRTH neither provides funds to nor maintains details of organizations, autonomous bodies and educational institutions engaged in research activities on road safety in the country. Members were also informed that safety equipment are now being installed on certain national highways, and that the government policy allows only display of information signs for a hospital and not the name of a particular hospital on national highways.

Legislations related to road safety

Of the 196 questions on road safety asked in both the Houses, 19 (9.7%) were about legislations related to road traffic crashes. Of these 19 questions, 6 (31.6%) were about careless driving and driving under the influence of alcohol, 7 (36.8%) about the drivers' licensing system, and 6 (31.6%) about the use of seat belts, load regulations and vehicle norms for safety.

Provision of legislation to ensure deterrent punishment for drunken driving (a major cause of road crashes) and removal of liquor shops from national highways, issue of non-bailable warrants against drivers who kill and injure innocent travellers, and cancellation of the licence of drivers involved in road crashes were raised by some members. In addition, the need for uniform criteria for issuing driving licences for all the state governments was also raised, including ensuring that no individual holds more than one driving licence.

The MoRTH had issued instructions to the automobile industry to conform to the revised standards in vehicles of passenger safety features such as steering wheels, seats, seat belts and brakes. The MoRTH clarified that it was not empowered to make laws to control vehicles carrying hazardous material without proper safety measures, for example, long iron rods.

Questions to the MoHFW

A total of 4741 questions were asked to the MoHFW in the two Houses for the years 2002, 2003 and 2004. Of these, 10 (0.2%) were related to accident, trauma, emergency and road accident. Seven of these questions were related to setting-up or upgradation of trauma care services and the remaining 3 were related to proper attention to accident victims when they arrive at trauma centres for treatment.

DISCUSSION

RTI are not seen as a major public health concern in India even though these contribute considerably to the disease burden. This is also highlighted by the scarce health research output on RTI from India.[6] Road safety policies aimed at effectively reducing mortality and morbidity due to RTI require the

participation of various stakeholders, with the government being one of the important ones. This paper analyses the road safety issues that were raised/discussed by members of the Indian Parliament and the information provided to them by the MoRTH and MoHFW in 2002, 2003 and 2004 within the context of available data on RTI and road safety. Adequately informed politicians are essential to achieve effective road safety as they authorize policies, programmes and budgets. This paper highlights the gaps that need to be addressed for effective road safety policies in India.

The majority of questions (70.5%) raised by parliamentarians for the MoRTH in the years 2002–04 were related to national highways and mostly included questions on construction of new highways, funds available and allocated for the construction and repair of highways, and road connectivity in various parts of the country. Road safety accounted for 9.1% of all the questions asked, and half of these were about prevention of road crashes. The small number of questions asked to the MoHFW were related to trauma services.

Magnitude of road crashes

For a problem to be addressed as a public health concern, its magnitude and nature must be visible to policy-makers.[20] The data requested by and provided to parliamentarians dealt only with the number of crashes and people killed in these crashes, mostly on national highways. Although the data required to highlight trends in age-specific and sex-specific fatalities due to RTI are available from various sources, including the police records used by the MoRTH,[3–5,21] these are not assembled in a manner that could enable policy-makers to visualize important trends that would be useful in planning action. The available data clearly suggest that road users between 15 and 49 years of age and men account for the majority of fatalities due to RTI in India.[3,4,7,8,21] Age-, sex-, and road user-specific data are also necessary to comprehend the actual burden of RTI in social and economic terms. In addition, available data also suggest that, among the various types of road users, pedestrians and motorcyclists account for a large proportion of RTI in India.[7,8] The poor assembly and presentation of the data on RTI to policy-makers also highlights the need to improve the analytical and interpretative capacity of the technical experts within the MoRTH who prepare the answers on behalf of the Ministers to the questions raised in Parliament. Some concerns have been raised regarding the quality of data on road crashes maintained by the government;[8,22] however, this is beyond the scope of this paper.

In addition to mortality due to road crashes, data on RTI not resulting in death are also imperative for comprehensive road safety policies and planning of trauma care services, as many of the injured who survive a road crash utilize healthcare facilities. A study conducted in a government hospital in Chennai revealed that road traffic crashes accounted for 35% of cases in casualty departments,[23] and for 60% of traumatic brain injuries in a study in Bangalore city.[24] Such data play an important role in planning trauma care services. Only one question was asked in Parliament regarding the number of people who survived injuries sustained in road crashes.

The members were also informed that the total number of road crashes had increased over the years due to the increasing number of motor vehicles on the road. This statement reflects the perception that RTI are a price to be paid for the increasing motorization which is necessary for achieving mobility and economic development. However, there is sufficient evidence worldwide that factors such as poor road infrastructure, poor law enforcement, non-safe design of vehicles, and inadequate urban and environmental planning are also important contributors to road crashes.[1] Lack of understanding of the reasons for the increase in road crashes in India highlights the lack of a public health perspective among the technical experts within the MoRTH and police departments.

Causes of road crashes

The members of Parliament were informed that human error, mostly of drivers, was responsible for a majority of the crashes, with vehicle and environmental factors having a very small role. They were also informed that lack of traffic discipline and driving under the influence of alcohol accounted for the majority of human errors. The robustness of this information is questionable. A recent review of data on accidents collected by the Hyderabad City Traffic Police revealed that the cause of accident for all the cases was recorded as 'negligence of the driver' because such a recording by the police did not require any proceedings in a court of law, and thereby served to reduce the administrative burden for the police as their resources were limited.[8] Such inaccuracy in data reinforces the traditional view that road crashes are caused solely by human error. There is sufficient evidence worldwide to suggest that it is time to move beyond this traditional view as factors such as road design, vehicle, traffic law enforcement also influence human behaviour on the road.[1,25–27]

Over the past many years, there have been paradigm shifts in the perception and understanding of road crashes among road safety professionals around the world.[1] One of these shifts is the understanding that common driving errors and pedestrian behaviour should not lead to death or serious injuries, and that the traffic system should help road users to cope with the changing traffic conditions.[1] In other words, the traffic system should attempt to accommodate for human error on the road rather than blaming crashes on negligence of the road user as is currently being done in India. A fundamental change in perceiving and dealing with road crashes is needed among the technical experts in MoRTH and police department by moving beyond the negligence of the road user as the predominant cause of road crashes. This could be achieved by building capacity of the technical experts in MoRTH in developing a scientific public health approach towards road crashes. Such an approach would then generate robust data on the range of underlying causes of road crashes and assist in creating a system that tries to accommodate for human error on the road.[1]

Prevention of road crashes

Many of the recommendations to address the cause of road crashes related to drivers, followed by traffic law enforcement. The recommendation to train drivers is not surprising because 'fault of driver' was reported as the major cause of road crashes. In India, it is relatively easy for people to get a licence without proper driving skills. Hence, emphasis on proper training of drivers through a proper driving licence system, though necessary, should not be viewed as an effective way to reduce road crashes as evaluation of most driver training programmes worldwide has shown no evidence that these programmes are effective in reducing road crashes.[25,28–30] In addition, focusing solely on drivers would not result in the desired level of road safety for all road users in the current social context in India. For many crashes between a pedestrian

and a motor vehicle in India, the pedestrian is seen as a victim of negligence of the driver, irrespective of what caused the crash (for example, sudden appearance of a pedestrian on the road). All road users should be required to obey traffic laws irrespective of whether they are pedestrians or drivers. However, reliable data on what caused the crash are not readily available in the police records in India to inform policy-makers of the appropriateness of preventive strategies.

Increasing the penalty for traffic law offences was also recommended. A recent review of the penalty for traffic law offences in Hyderabad city revealed that the majority of offences incurred a fine of Rs 50 (US$ 1.1) to the drivers,[27] which is less than the per capita GDP per day (US$ 1.3) in India.[31] Many people whose earnings are close to the average GDP per day are likely to be pedestrians or users of the public transport system, and hence do not feature in the traffic law enforcement activity of the police. The average per day income of drivers who feature in the traffic law enforcement activity is likely to be higher. It has been suggested that the effectiveness as a deterrent of an amount less than the income of one day even for the lower end of the income spectrum of vehicle owners in Hyderabad city needs to be assessed, and revisions made accordingly.[27] This is also likely to be true for other cities in India.

In addition to penalty, traffic law enforcement *per se* needs to be made more visible, as the perception of a likelihood of being caught is a much stronger deterrent than the severity of penalty.[27,32,33] Data from Hyderabad city suggest that only 0.6 traffic personnel are available per 10 000 population in the city resulting in a low perceived risk among drivers of being detected and punished for a violation, making them less apprehensive of traffic law enforcement.[27] However, enhancing traffic law enforcement was not mentioned among the preventive strategies discussed in Parliament.

Better road design and improved vehicle safety norms are necessary to prevent road crashes but these measures should be based on data substantiated by research that is relevant for India. Locally designed vehicles that do not conform to international safety standards are increasing in India, e.g. a three-wheeled vehicle to seat 7 passengers. Though it may be unreasonable to impose international safety standards on such vehicles in the social and economic context of India, these vehicles should be manufactured to conform with good scientific principles including provision of basic safety equipment to make them safe for the drivers and other road users.[34]

The MoRTH informed Parliament that much importance was given to road safety campaigns in preventive strategies. It is now well established that the belief that increasing road user knowledge would produce behaviour change reflects a naïve view of human behaviour.[25,30] There is sufficient evidence that such campaigns neither result in a change in behaviour nor a reduction in road crashes, but these are still advocated, resulting in a waste of resources.[30] There are only a few conditions under which such education is effective—programmes intended for children and programmes where the communicator has some control over an area of importance to the audience.[30,35]

Provision of emergency care for those injured is as important as preventing crashes. Reviews of trauma care capacity in low- and middle-income countries have shown that many doctors and nurses providing trauma care have had little training in the field, many hospitals do not have essential low-cost supplies for trauma care, and in many hospitals there are prolonged delays before emergency surgery is undertaken.[36] The strategies listed by the MoRTH dealt only with provision of ambulances and trauma care centres on the highways. Many of the injury-related disabilities and deaths in low- and middle-income countries are readily amenable to low-cost measures, and guidelines for emergency medical systems in low- and middle-income countries are available which contain recommendations on various aspects of emergency trauma care.[37] It is essential that such guidelines are taken into account by policy-makers and technical experts in the MoRTH and MoHFW to improve emergency care in India.

Mere application of road safety policies based on the experience of other countries will not improve road safety in India. Establishment of a National Road Safety Council and the recommendation to establish a research centre for road safety are important actions in this regard. Increasing the evidence base of road safety issues that are of relevance and concern in India and their possible solutions within the local context are necessary for effective policy-making. Experience in highly motorized countries has shown that concerted action based on reliable data and road safety research can lead to reduction in mortality rates due to road crashes.[1,9]

Legislation related to road safety

'Fault of driver' as a cause of road crashes was also reflected in the discussion on legislations. Though the legislations discussed were important, no legislation or its implementation was discussed relating to pedestrians and motorized two-wheeler (MTV) riders who sustain a majority of the fatalities and injuries due to road crashes in India.[7,8,21] Parliamentarians need to be presented road safety data for different types of road users for them to understand what legislations are needed to reduce fatalities and to effectively improve road safety. For example, even though the Indian Motor Vehicle Act of 1988 stipulates compulsory wearing of helmets by MTV users,[38] helmet use varies from very low to 100% based on the level of enforcement of the mandatory helmet law in the various states/cities in India. A recent study of MTV drivers in Hyderabad reported that only 30.2% of MTV drivers used a helmet,[39] and this finding is of importance because head injuries are the main cause of death and disability in MTV users.[24,40,41] Using a helmet has been shown to be the most successful approach to prevent and reduce fatal and serious head injuries in MTV users.[42–44] However, no question regarding the use of a helmet by MTV users was asked in Parliament. Again, the need for better assembly and presentation of the available data along with types of injuries by the technical experts in the MoRTH is highlighted to enable policy-makers to raise and discuss appropriate and relevant legislations for improving road safety in India.

Recommendations

The *World report on road traffic injury prevention* calls for governments to make road safety a political priority, and highlights recommendations with regard to policy, legislation and enforcement, and development of institutional capacity to improve road safety.[1] This report also makes specific recommendations for road safety interventions and provides guidance to various stakeholders in road safety which can be utilized by the MoRTH to improve road safety in India. For a broader recognition of road safety as a public health problem in India among parliamentarians, the following actions are recommended:

1. Make better use of the available data on road crashes to reflect the true magnitude of the problem in terms of age, sex and type of road user.
2. Increase the comprehensiveness of road crash data to better understand the factors that result in road crashes and the impact they cause to plan appropriate prevention strategies.
3. Improve the technical capacity of the respective ministries to analyse data, identify issues, and implement evidence-based solutions.
4. Put systems in place for technical experts in the respective ministries to be up-to-date with the latest information on road safety.
5. Take necessary steps to improve the robustness of data on road crashes.
6. Move beyond the traditional view of human error as a major cause of road crashes.
7. Ensure increased visibility of traffic law enforcement.
8. Reduce wastage of resources on general road safety campaigns as these are ineffective in improving road safety.
9. Ensure that legislations to improve road safety reflect the interests of road users who are most vulnerable to RTI.
10. Enact and enforce legislations requiring the use of helmets by users of MTV and seat-belt use by users of other vehicles.
11. Increase the role of the health sector in data collection and analysis, and improve coordination between the MoRTH and MoHFW for locally relevant and effective emergency care.

In the long run, various professionals working in different aspects of road safety need to work towards dissemination of their findings to the government and public in order to make road safety visible as a public health concern that is commensurate with the disease burden caused by RTI. Adequately funded research needs to be facilitated to generate data that can be utilized for implementing an informed, comprehensive and coordinated road safety agenda so that the high burden of mortality and morbidity due to road crashes in India can be effectively addressed. A related issue is the need to strengthen the research capacity in road safety in India through development of a critical mass of road safety professionals in university departments and research/academic institutes.

In conclusion, the data on road safety sought by members of the Indian Parliament and the manner in which these were presented to them by the MoRTH does not highlight the true nature of the problem to readily facilitate comprehensive assessment of RTI and legislations related to road safety. Appropriate policy and intervention responses by policy-makers are also not possible with data that are neither comprehensive nor robust. Much can be done to use the available data more effectively for appropriate preventive strategies and legislations for road safety, and to further generate relevant data about the magnitude, causes and impact of RTI in order to raise awareness about issues that are critical in planning road safety and to make road safety prominent in policy-making in India to a degree that is commensurate with the burden that RTI impose on society.

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