

ROAD TRAFFIC INJURIES IN KARACHI: THE DISPROPORTIONATE ROLE OF BUSES AND TRUCKS

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Abstract. Road traffic accidents result in substantial injury and death in Karachi. We reviewed the patient logs of the two largest government hospitals in Karachi between December 1993 and February 1994 to identify those persons most likely to be injured in a road traffic accident and to identify the vehicle types which were most likely to be involved. 86% of 727 road injury victims were male. Their mean age was 31 years. One hundred of thirty-one (18%) died. Pedestrians and motorcyclists were the most common victims accounting for 46% all injuries and 51% of deaths. Although buses and trucks were less than 4% of the registered vehicles in Karachi they were the striking vehicle among 49% of all injuries and 65% of the deaths. Road traffic accidents disproportionately affect wage earners. Specific interventions to improve the road safety of trucks and buses are needed.

INTRODUCTION

There are an estimated 10 million road traffic accidents resulting in 885,000 deaths annually worldwide (World Health Organization, 1995). Although injury and death rates from road traffic accidents are decreasing in most industrialized countries they are increasing in many less developed countries. For example between 1968 and 1983 road traffic mortality decreased by 20% in Europe, but increased by more than 200% in African countries and by 150% in Asian countries (Söderlund and Zwi, 1995). This marked increase in motor vehicle injuries and deaths in less developed countries has been associated with the rapid rise in motor vehicle ownership (Shiow-Ing and Malison, 1990). For example in Saudi Arabia between 1971 and 1989 as the number of registered vehicles increased from 150,000 to 5 million, the number of motor vehicle associated deaths between 1979 and 1989 increased from 2,871 to 23,697 (Shanks *et al*, 1994). Not only do motor vehicle accidents kill and maim the population, but they also consume a large quantity of limited health resource. Indeed, road traffic accidents are estimated to consume approximately 1% of the Gross National Product of developing countries (Stansfield *et al*, 1992).

In Karachi, Pakistan there has been a marked increase in the number of motor vehicles on the road increasing from 278,000 (Bureau of Statistics, 1986) in 1984 to 500,000 in 1992 (Bureau of Statis-

tics, 1994). In this setting we would predict an epidemic of road traffic accidents. Thus we conducted a study to identify persons most likely to be injured in a road traffic accident and to identify the vehicle types most likely to be involved.

METHODS

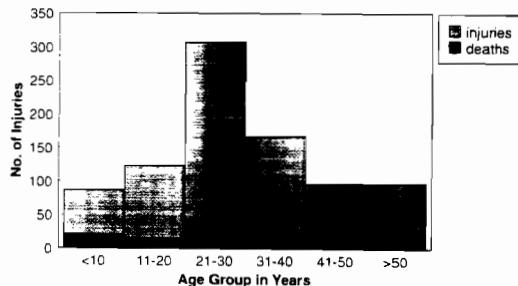
Pakistan law requires that all road traffic accidents which result in physical harm to persons, be reported to the medicolegal officer in recognized government hospitals. The details of these cases are recorded in an official record book maintained by the medicolegal officers upon examination of the injured victims in the hospital emergency room. There are eight government hospitals with medicolegal officers in Karachi, but the two largest, Abassi Shaheed Hospital, and the Jinnah Post Graduate Medical Center Care for 73% of all motor vehicle accident victims transported by the largest ambulance service in the city (Edhi Ambulance Service, personal communication). We retrieved data for road traffic accidents occurring during the three month period between 1st December 1993 to 28th February 1994 from the medical legal records kept at these two hospitals using a data summary sheet. For each registered accident we recorded the date, sex, age, road user class of the victim, and the type of striking vehicle. We entered data on microcomputer and analyzed it using Epi Info (Dean *et al*,

1990). We used relative risks and Yates corrected chi squares to compare the distribution of vehicle types involved in traffic accidents in the study to the official government estimates of frequencies of types of vehicles registered in Karachi (Bureau of Statistics, 1994).

RESULTS

There were 727 road injury victims reported during the three month period at the two study hospitals. Six hundred twenty seven (86%) were males. The mean age of victims was 31 years, with 54% of the non-fatally injured victims and 47% of the deaths occurring among persons between age 20 and 40 years (Fig 1). One hundred thirty-one (18%) of the 727 injured persons died during the study period; 63 (8.7%) were dead on arrival at the hospital, while 68 (9.4%) died later in the emergency room or after being shifted to the ward.

Pedestrians (35%) and motorcyclists (13%) were the most frequent victims, accounting for approximately half of all injuries and deaths (Table 1). The vehicle that struck the victim was unknown among 31% of the non fatal injuries (241/595) and 28% of the deaths (37/131). Restricting the analysis to only those victims for whom the striking vehicle is known, in 27% (97/354) of the injuries and 43% (40/94) of the deaths the striking vehicle was a bus. In contrast, buses accounted for only 1.8% of the registered vehicles on the road. Similarly, in 22% (114/354) of the non-fatal injuries and 22% (21/94) of the deaths a truck was the striking vehicle. Trucks accounted for 1.9% of the registered vehi-



no age was listed for 24 persons

Fig 1—Number of motor vehicle injuries and deaths by age group presenting to the two major trauma hospitals, Karachi Pakistan, 12/93-3/94. (n = 703).

Table 1

Number and percent of motor vehicle injuries and deaths by road class of victim presenting to the two largest trauma hospitals, Karachi Pakistan, 12/93-3/94. (n = 726).

Class of road user	Injuries (%)	Deaths (%)
Pedestrian	196 (33)	55 (42)
Motorcyclist	79 (13)	12 (9)
Car	71 (12)	11 (8)
Bus	50 (8)	17 (13)
Truck	12 (2)	5 (4)
Other	19 (3)	1 (1)
Unknown	168 (28)	30 (23)

* The vital status of one victim was not recorded.

cles in Karachi. Thus, 49% of the non fatal injuries and 65% of the deaths were caused by large commercial vehicles that comprise less than 4% of the vehicles on the road in Karachi (Table 2).

Persons who were struck by a bus were 1.7 times more likely to die than persons who were struck by other vehicles (43% versus 27%, relative risk 1.7, 95% confidence interval 1.2, 2.4, $p = 0.007$).

DISCUSSION

Buses and trucks in Karachi were involved in a disproportionate number of road traffic injuries and deaths. This finding is similar to a report from Papua New Guinea, where buses had the highest accident rate of any vehicle type, and there was a strong correlation between the number of registered buses and the number of motor vehicle injuries (Jayasuriya, 1991). Clearly buses and trucks are dangerous far out of proportion to their numbers. Attempts to lower the rate of motor vehicle injury and death in Karachi should focus first on these highest risk vehicles.

Karachi road traffic accidents exact a particularly high price because they disproportionately affect wage earners. Although persons age 20-30 years comprise 17% of the Karachi population (Federal Bureau of Statistics, 1991) they were involved in 30% of the nonfatal motor vehicle injuries and 22% of the deaths. Moreover, 54% of the

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Table 2

Number of vehicles registered in Karachi and their relative contribution to road traffic injuries and deaths among motor vehicle accident victims with a known striking vehicle presenting to the three major trauma hospitals, Karachi Pakistan, 12/93-3/94.

Vehicle type	No. and (%) vehicles officially on the road in Karachi	Injuries (%)	Deaths (%)
Buses and minibuses	12,855 (1.8)	97 (27)	40 (43)
Trucks	13,775 (1.9)	77 (22)	21 (22)
Cars	309,987 (43)	112 (32)	17 (18)
Motorcycles	307,278 (43)	28 (8)	2 (2)
Other vehicles	73,694 (10)	40 (11)	14 (15)
Total	717,589	354	94

non-fatally injured and 47% of the dead victims were between 20 and 40 years of age. Disability and death in this age group represents substantial years of productive life lost, and also adversely affects the health, nutrition, and educational opportunities of family members dependent on their income.

Men in Karachi are at increased risk of road traffic injury and deaths compared to women. This increased risk likely reflects the greater exposures that males have to traveling and to motor vehicles. Indeed, the increased rates among Karachi men are similar to data from countries with similar male cultural roles like Saudi Arabia where 81% of the road traffic victims are males (Shanks *et al*, 1994).

It is possible that the injury victims seen at these two hospitals during this three month period are not representative of all Karachi road traffic injury victims. However, these two hospital see the majority of the reported motor vehicle injuries reported in the city, and we are not aware of data that suggests there is marked seasonal pattern of motor vehicle injuries in Karachi. It is also possible that had we been able to determine the striking vehicle for the one third of victims for whom it was not identified, the relative proportion may have changed of injuries that were due to buses and trucks. However, we have no reason to believe that buses and trucks would be any more likely to be identified than other vehicles. Moreover, even if we assumed that all of the undetermined striking vehicles were

neither buses nor trucks, buses and trucks would still account for a disproportionate number of injuries and deaths.

Clearly, road traffic accidents are a major public health problem in Karachi. Reducing road traffic injuries and death within the limited resources of a developing country requires a public health approach. This study suggests that focusing on identifying and controlling the risk factors for bus and truck injuries might be a particularly effective way to prevent injury and death.

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