
Letter to the Editor

Dear Editor,

Factors involved in the past and present history of road traffic injuries and deaths in Iran

We enjoyed the articles by Naghavi et al.¹ and comments of Dr. Nayernouri² in the very important subject of road traffic injuries (RTI) and fatal RTI in Iran. Naghavi et al. emphasized the role of rapid motorization including increasing vehicular mass, cheap petrol (0.4 USD/gallon), and the increase in utilization of private cars for transportation in Iran. The authors found an association between the number of vehicles manufactured and the rates of RTI and fatalities over a time interval. Nayernouri highlighted disrespect for the law as a major cause of road traffic accidents and stressed the necessity of police enforcement of traffic laws.

With all due respect for both valuable ideas, there are several concerns with the analysis and explanation of the death rate of traffic accidents as well as several safety and design issues that may improve road safety in Iran.

First, the true death rate per vehicle-miles driven is an estimate since there is no accurate measurement of the number of miles commuted in Iran. In order to measure the total number of miles driven in Iran, a traffic-recorder is required. Current traffic recorders only record different types of vehicles on major highways, but do not record traffic on rural roads or city streets. Thus, the relative proportions of distance traversed by private car and public transportation have not been defined. Therefore, the authors have not provided sufficient evidence to confirm their conclusion that the bus and minibus is safer than private cars in Iran. Multiple injuries and deaths are seen each few days involving minibus and bus road traffic crashes (RTC).

Secondly, this paper shows an increasing trend of RTI and fatal RTI which has been present since previous years, but overlooks the decreasing trend of injuries and deaths following crashes in the recent two years of 2006 and 2007.³ The hypothesis of Naghavi et al. cannot explain this definite recent trend of reduction in RTI and especially fatal RTI in Iran (Table 1).

Furthermore, although the authors identify the roles of unsafe vehicles and behavior in road traffic crashes, they neglect the role of road safety design.

Design elements such as the separation of

opposing traffic with guardrails, construction of roundabouts,^{4,5} and adequate lighting serve as passive injury prevention mechanisms. Having safe roads needs costly intervention, but developed countries know the importance of this great investment in passive injury prevention rather than active insertion of thousands of policemen which, under the best of circumstances, cannot control more than 10% of the roads.

The most common causes of RTC in Tehran are three unsafe behaviors: speeding, overtaking from the wrong side, and the rapid changing of driving lanes.⁴ To have safe behavior, a systematic review of almost 300,000 people has provided no evidence that driver education is effective in preventing RTI or RTC.^{6,7} Pedestrian safety education can result in improvement in children's knowledge and can change observed road crossing behavior, if repeated at regular intervals, but whether this reduces the risk of pedestrian RTC and RTI occurrence is unknown.⁸

Continuous police enforcement may be necessary over several generations before it becomes an accepted cultural norm in society. Studies examining increased police patrol programs have been generally consistent in reporting the beneficial effects on RTI and deaths, although they may have some methodological limitations.⁹ Additionally, police safety have to be protected in the face of pressure from offenders or other officials.

Possible factors involved in the increase in RTI and fatal RTI in Iran are the disproportionate growth rate amongst the population and unsafe vehicles, speeding at the time of crash, careless driving, limited road development infrastructure, few pedestrian-control devices, few alternatives to playing in the streets, and frequent and inconsistent distribution of vacations.

Possible factors involved in the recent decrease in RTI and deaths are due to a variety of interventions, including: seat belt legislation for drivers and front passengers, helmets for motorcycle riders, direct police enforcement, police cameras for monitoring speeding, improved health care facilities, public education campaigns, the police school assistance program, and identification of more than 2,000 hazardous locations on the country's main road network.⁵

Prevention of road traffic injuries in Iran

Table 1. Rates of road traffic injury (RTI) and fatal RTI in Iran (1997 – 2007)

Year	Population	RTI/100,000 population (95%CI)*	Fatal RTI/100,000 population (95%CI)*
1997	61,897	109.7(108.9 – 110.5)	22.1(21.7 – 22.4)
1998	62,640	126.6 (125.7 – 127.5)	23.9 (23.5 – 24.3)
1999	63,392	143.6 (142.7 – 144.6)	24.4 (24.0 – 24.8)
2000	64,153	168.5 (167.5 – 169.5)	26.6 (26.2 – 27.0)
2001	64,922	181.1 (180.1 – 182.1)	30.4 (30.0 – 30.8)
2002	65,701	254.8 (253.5 – 256.0)	33.3 (32.9 – 33.7)
2003	66,490	334.4 (333.0 – 335.7)	38.7 (38.2 – 39.2)
2004	67,478	364.2 (362.8 – 365.6)	38.6 (38.2 – 39.1)
2005	68,467	400.6 (399.1 – 402.1) ^a	40.5 (40.1 – 41.0) ^a
2006	70,473	392.7 (391.3 – 394.2) ^a	39.1 (38.7 – 39.6) ^a
2007	71,532	343.1(341.7 – 344.6) ^a	32.0(31.6 – 32.5) ^a

requires leadership to implement the cooperation of multiple governmental agencies including law enforcement, road construction, vehicle safety standards, public education, health, and nongovernmental organizations.

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Conflict of Interests

The author has no conflict of interests to disclose.

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Authors' Reply

We reviewed the comment made by Dr. Rahimi-Movaghar on our paper titled “Adverse Health Outcomes of Road Traffic Injuries in Iran After Rapid Motorization” published in Issue 12 of the Archives of Iranian Medicine. We strongly agree that the government should take serious steps in improving the safety of roads and the vehicles rather than solely blaming the drivers as the main cause of road crashes. Effective control of road traffic injuries requires a comprehensive system strategy that accounts for the role of the human-vehicle-environment triad during the various stages of a crash.¹

We think, however, that the commentator has understated the overall message of our paper: the sharp increase of car and motorcycle production in Iran has been closely associated with a sudden increase in both morbidity and mortality due to road injuries. We did not aim to overlook the importance of other factors that can potentially justify the upward trend of the adverse outcome of road injuries. While we did not quantify the contribution of all other possible factors, which may explain the increasing trend of road deaths and morbidity over the period of 5 years from 2000 through 2005, we believe that the association we found could not be explained by chance.

It is worth noting that the number of road injuries as extracted from the Forensic Medicine databases, the one that the commentator refers to, underestimates the actual road injury events.²

However, we believe that the time trend of road injury events may remain the same regardless of the data source. The Forensic Medicine road injury data and that of the Vital Registration displayed a parallel increasing trend in road injury mortality in our analysis of road injuries for six years from 2000 through 2005. It is important, however, to continuously check the validity of the Forensic Medicine data against a multi-source database such as the national death registration system.

The decreasing trend of road injuries after the year 2005 is very interesting and extremely important. Therefore, seeking reasons behind the decrease is particularly important. Taking measures such as an increase in police patrolling, the production of safer cars and motorcycles, better control over speed limits, increasing the use of helmets, and encouraging the use of safer travel means such as trains may all be among the reasons behind the decelerated rate of road injury death in Iran in recent years. Unfortunately, it is difficult to analytically disentangle the pure effect of any single measure on the road injury outcome. Finally, it is important to note that only two years of decreasing trend is not enough to make any judgments on the beneficial effects of interventions such as making safer roads and vehicles on the adverse outcomes of road injuries. Most cars on the roads and most roads, themselves,

are still unsafe. The recent actions taken by the government and the car companies to make roads and vehicles safer and that to improve the driver behavior will need several years of sustained efforts to show positive effects on the adverse road injury outcome. We still believe that public transportation such as trains in comparison to the private use of vehicles, provides a much safer means of travel. We hypothesize that per capita mortality and morbidity due to crashes of public transportation vehicles, adjusted for kilometers travelled, would be lower than that of private vehicles in Iran. In addition, public transportation is environmentally a more sustainable mode of transportation.

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- 2 Zavareh DK, Mohammadi R, Laflamme L, Naghavi M, Zarei A, Haglund BJ. Estimating road traffic mortality more accurately: Use of the capture-recapture method in the West Azarbaijan province of Iran. *Int J Inj Contr Saf Promot*. 2008 Mar; **15**: 9-17.

Retraction

We are sorry that we have to retract the following articles due to significant plagiarism by authors. *Archives of Iranian Medicine* is a member of Committee on Publication Ethics (COPE) and is devoted to its guidelines and principles. Hereby we apologize for the inconvenience to the readers.

Ameloblastomatous calcifying odontogenic cyst: a case report of a rare histologic variant.
Arch Iran Med. 2009 Jul; **12(4)**:417-20.

Peripheral calcifying odontogenic cyst.
Arch Iran Med. 2009 May; **12(3)**:309-12.

Desmoplastic ameloblastoma (a hybrid variant): report of a case and review of the literature.
Arch Iran Med. 2009 May; **12(3)**:304-8.

Squamous cell carcinoma of the tongue in a 13-year-old boy.
Arch Iran Med. 2008 May; **11(3)**:341-3.