

Road Traffic Injuries: A Challenge for Iran's Health System

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Abstract

Road traffic injury (RTI) was the leading cause of premature death and disability in I.R.Iran, measured by disability-adjusted life-year (DALY) in 2003. In this paper, we describe the progress and challenges of health system dealing with RTI. MOH&ME has initiated or contributed in national efforts with collaboration of Police, Ministry of Road & Transportation (MoRT), media and Iranian Red Crescent Society (IRCS). As for the pre-crash and crash phases, EMC works on Safe Community (SC) project and public awareness. To minimize the risk of post-crash phase, MOH&ME has enhanced the EMS capacity in terms of technical, equipmental and operational, which has led to coverage of 95% of mass casualty incidents and decreasing the "to scene" and "transport" times. Despite the 16.9% decreasing number of RT-related death in 2007, Iran is in the highest rank in the world. RTI prevention needs a national concerted campaign with collaboration of health system and all other concerned partners. The most costly interventions are those deals with road design and safety during pre-crash and crash phases. But, focusing on people through awareness of safe traffic behavior with combination of low enforcement, would lead decreasing the RTI in shorter time. Health system needs to focus on groups at the highest risk, including urban accidents and young men drivers. Increasing the quality and coverage of EMS, road risk assessment and close intersectoral collaboration would assist health system on the prevention programs. Injury research and surveillance are the basis for effective injury prevention.

Keywords: *Road traffic, Injury, Iran*

Introduction

Road traffic injury (RTI) was the leading cause of premature death and disability in I.R.Iran, measured by disability-adjusted life-year (DALY) in 2003. It led to loss of more than 1.3 million years of Iranians' life, with the male to female ratio of 5:1. This figure is responsible for 9.1% of all-causes and 32.9% of all-types injury on the DALY scale. Premature death accounts for 65% of those measured DALYs (1). RTI caused 11% of total death in 2003, which was about 2 times more than world's average (2). RTI put also considerable financial and psychosocial strain on families and survivors. In this paper, we describe the progress and challenges of health system dealing with RTI.

Road traffic injury prevention in MOH&ME

Emergency Management Center (EMC) is the responsible center in Ministry of Health & Medical Education (MOH&ME) for Emergency

Medical Services (EMS) and Injury Prevention & Safety Promotion programs. To reduce the risk of RTI, EMC has initiated or contributed in national efforts with collaboration of Police, Ministry of Road & Transportation (MoRT), media and Iranian Red Crescent Society (IRCS), which is responsible of road rescue with 200 stations running by volunteers all over the country. EMC chairs the EMS Committee under Road Safety Commission (RSC) in MoRT.

As for the pre-crash and crash phases, EMC works on Safe Community (SC) program and public awareness, which target not only the people, but also car producers, producers or importers of safety devices and road safety managers. Advocacy of helmet use and child restraints are among the topics of public education. MOH & ME started the SC pilot program since 1996 in five districts, which was extended later to one district per province in 2003 (3). Three urban

areas have been designated by World Health Organization (WHO) as SC so far. In the context of SC, from 2003-2007, injury prevention programs in Kashmar (*kāshmar*), located in Razavi-Khorasan province, could decrease the traffic-related death by 40% in pedestrian and 8% in motorbike riders, and increased the helmet use from 0.36% to 47%. Considering the key role of the community as first respondent in emergencies, BAHA (*bahā*) (Basije Hameganie Amoozeshe Ehia), being implemented by EMC, has trained more than 200,000 people in the country on cardiopulmonary resuscitation (CPR). To minimize the risk of post-crash phase, MOH & ME has enhanced the EMS capacity in terms of technical, equipmental and operational. Accordingly, from 2003 to 2008, the number of ambulances and EMS stations has been increased to 2.5 and 2.3 times around the country, respectively (Figure 1). Air ambulance facilities also are increased from 1 in 2000 to 11 in 2008. To increase the EMS mobility in large and crowded metropolitan areas, motorbike emergency services are increased 1.5 times from 2003 to 2008. Furthermore, the number of temporary stations during national holidays, especially Nowrooz, is increased from 50 in 2003 to 93 in 2008. Coordinated with Police and IRCS, EMC is unifying the radio codes for better coordination and communication. As the result, from 2005 to 2007, average “to scene time” is decreased from 10 min to 7 min, inside the cities and from 25

min to 14 min, outside the cities. “Transport time” is 22 min in average and “death to transported ratio” is 1.5%. EMS covers about 50% of all traffic accidents, but provides services to about 95% of mass casualty incidents defined as incidents with at least 5 injured or 3 deaths. EMS covers 61% of the country’s free-ways, 87% of highways and 77% of main roads. MOH&ME also provides all traffic injured with total insurance coverage of medical emergency services.

As Fig. 1 indicates, the RT-related mortality reveals an upward trend from 2003 to 2006, while decreased in 2007 to 22,918 from 27,567 in 2006 (4). Despite the ever-increasing trend of motor vehicle production, the number of traffic accidents and RT-related death showed 13% and 16.9% decrease, respectively, from 2006 to 2007. Looking at the number of RT-related death in the first 6 month of 2008, shows no change compared to same period in 2007 (5). It may be explained by decreasing the petrol subsidy that shifted people to public transportation, success in law enforcement and changing the people’s risky behaviors or better performance of EMS, but more research is needed to clarify the reasons anyway. Six percent increase in “death to accident ratio”, from 2006 to 2007, can be attributed to shifting people to use public transportation, including bus, due to raising the petrol price. Figure 1 also shows that parallel to growing number of motor vehicles, number of EMS stations and ambulances are increased.

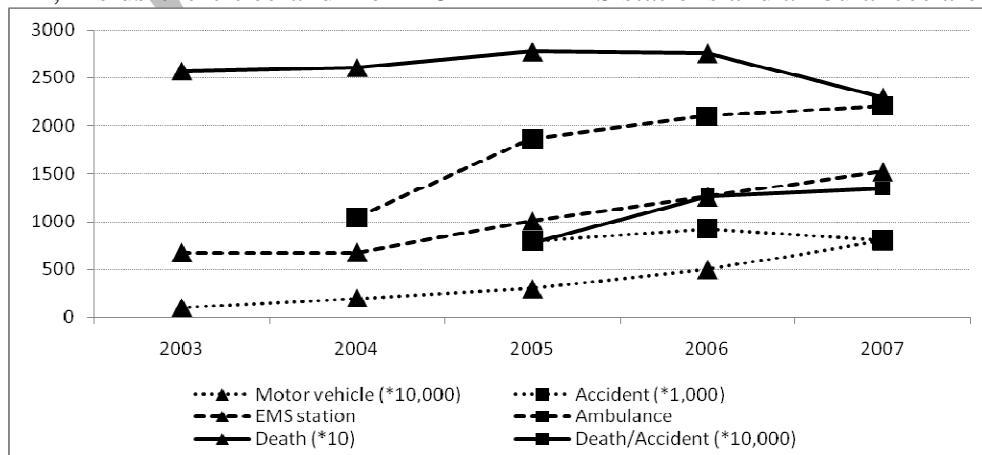


Fig. 1: Number of motor vehicle production, accidents, EMS stations, ambulances, death and death to accident ratio, 2003-2007, I.R.Iran

Discussion

Despite the pattern that was observed in 2006-2007, rate of RT accident and injury is the highest in the world. RTI prevention needs a national concerted campaign with collaboration of health system, Police, MoRT and IRCS. Haddon matrix provides a useful analytical basis for designing and prioritizing the intervention programs over short and long-term of time (6). This model consider the required measures that are related to human, vehicle and environment in pre-crash, crash and post-crash phases. To be effective, the intervention programs should take into account the multidimensional nature of RTI applying a systemic approach, considering the socio-economic and cultural backgrounds of the community and the role of all concerned partners (7).

The most costly interventions are those deals with road design and safety during pre-crash and crash phases. However, focusing on the people at highest risk through awareness of safe traffic behavior with combination of low enforcement, would lead decreasing the RTI in shorter time. Police has already adopted appropriate policies to support seat belt intervention through intensive enforcement and public awareness. As for large cities, it is estimated that about 75% of car drivers use the seat belt and about 20-25% of two-wheeled motor riders use helmet (8). The type of a helmet is important too, as most of riders do not use a standard helmet, which could cover all parts of head, face and neck.

Health system needs to focus on groups at the highest risk. Evidences revealed that incidence of injury in urban areas was 4.6 times more than rural parts (9), age group of 15-29 accounts for 50% of RTI-related DALYs (1), motorbikes are responsible of the most part of death of 15-30 yr old, men are 4.6 time in greater risk than female (1) and car and motorbikes riders were victims of RT accidents in 37% and 29% of total cases (2), respectively.

Regarding the systemic approach, MOH&ME should enhance the quality and coverage of

EMS, including communication coverage outside the cities. Risk assessment of roads with collaboration of MoRT would assists health system to prioritize settling EMS stations. Health system can also assist the Police to equip with a rapid diagnostic test of drug abuse. Health system needs focused research on analyzing the chain of events leading to crashes and evaluation of intervention programs. Injury surveillance is cornerstone of any prevention program. In this regard, the hospital-based injury surveillance run by MOH&ME should be strengthened in term of technical capacity and coverage.

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References

1. Ministry of Health & Medical Education (MOH&ME) (2007). *National burden of disease and injury in I.R.Iran*. Tehran: MOH&ME Pub.
2. Bhalla K (2009). *Estimating the global burden of road traffic injury*. Available: http://siteresourcesworldbank.org/INTTRANSPORT/Resources/336291-1153409213417/Presentation_kavi_low_res_ppt.
3. Moghisi AR, Raoufi M, Rafizadeh S (2007). *A guideline for cost-effectiveness calculation in Safe communities*. I.R.Iran. Tehran: Ministry of Health & Medical Education (MOH&ME) Pub.
4. Emergency Management Center (2007). *Report of national injury surveillance*. Ministry of Health & Medical Education.
5. Emergency Management Center (2008). *Report of national injury surveillance*. Ministry of Health & Medical Education (unpublished).
6. Haddon Jr W (1980). Advances in the epidemiology of injuries as a basis for public policy. *Public Health Report*, 95:411-21.

7. Mohan D, Tiwari G, Khayesi M, Nafukho FM (2006). *Road traffic injury prevention: training manual*. World Health Organization.
8. Emergency Management Center (2008). *Emergency Medical Service (EMS) report*. Ministry of Health & Medical Education.
9. Emergency Management Center (2006). *Report of national injury surveillance*. Ministry of Health & Medical Education.

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