

## Disaster Health Management: Iran's Progress and Challenges

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### Abstract

I.R.Iran is exposed to a wide variety of natural and man-made hazards. Human-related consequences of disasters and its impact on health service delivery bring the health to the top agenda of disaster management. This article presents the DHM's progress in Iran and the related challenges. Iran has achieved considerable academic and administrative success in terms of emergency management and risk reduction in health sector, but many rooms for improvement are left. Earthquakes of Bam (2003), Zarand (2005) and Lorestan (2006), Golestan floods (2001 and 2005), Cyclone Gonu (2007) and re-current droughts were the largest disasters during last 10 years, which health system could learn from and apply the lessons learned. The challenges have been changed during last decade, as disaster health management upgraded from a unit under Center for Environmental Health to Emergency Management Center under deputy of minister directing national Emergency Operations Center (EOC). Health system needs strengthening intra and inter-sectoral collaboration and coordination, information management system, community-based initiatives and integration of disaster health management in Primary Health Care (PHC) network. It also needs to focus on disaster risk reduction, while enhancing response capacity. Investing on research would lead to quality decision-making in disaster health management.

**Keywords:** *Disaster, Health, Iran*

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### Introduction

Iran (the Islamic Republic) located in Central Eurasia, with a population over 70 million, is exposed to a wide range of natural and man-made hazards. Human-related consequences of disasters and its impact on health service delivery bring the health to the top agenda of disaster management (1). According to EM-DAT (2), 181 disasters are recorded in Iran for 1900-2007 period, which caused 155,811 deaths, 168,217 injured and 44,037,516 affected. Earthquake, drought and floods are the most important hazards, in terms of mortality, economic damage or people affected. Furthermore, as of January 2007, Iran was among world's top 10 refugee-hosting countries with 968,000 refugees (3). Disaster health man-

agement (DHM) is systematic process of using administrative decisions, organization, operational skills and capacities to meet the challenge of planning for, responding to and recovering and mitigating from health consequences of disasters. In this article we present a summary from DHM's progress so far and the challenges we are faced.

#### ***Disaster health management: Structure, functions and lessons learned***

*Emergency Management Center (EMC)*, under Deputy of Health in MOH&ME is the center for planning, coordination and supervision of health emergencies. Head of EMC is the secretariat for both Health Taskforces/Committee of National Crisis Management Organization (NCMO) and Passive Defense Organization (PDO); two national

leading organization for emergency management. In addition, EMC comprises Emergency Medical Service (EMS) and national Emergency Operations Center (EOC). The intra-sectoral partners of EMC include other centers of Deputy for Health and different related deputies, centers and departments in MOH&ME. An emergency liaison officer is appointed by all the centers or departments. The country is divided to 9 emergency management regions, each includes 2 to 4 provinces and has established its own EOC. EOCs are established in national, all regions and about 90% of provinces. Figure 1 provides a schematic structure of DHM in MOH&ME.

Functional collapse of Bam health system following serious structural damage by the earthquake of 26 Dec 2003 taught the system how effective could have been *risk mitigation*. Accordingly, a national assessment revealed high structural vulnerability of the hospitals, which led to defining a 10 yr mitigation program. MOH & ME collaborates with Government-UNDP Five-year National Joint Program in two demonstration cities of Gorgan and Kerman to develop the models of hospital safety (4) and has contributed in 2008-2009 WHO-ISDR Global Campaign on Hospitals Safe from Disasters.

*Rapid health assessment (RHA)* team is shaped in national and regional EOCs and the training for provincial and district levels are planned. RHA provided timely and useful information about damages and needs of affected population in Bam (2003), Zarand (2005) and Lorestan (2006) earthquakes and Cyclone Gonu (2007). The assessments were continued by establishment of disease surveillance system. A geographic-based cluster sampling method was applied also for household survey in Bam (5). Guideline of *Disease Surveillance* in Disasters (6) was developed during Bam earthquake and was applied in the other disasters afterward. The sensitive and symptom-based surveillance system of Bam monitored occurrence of the most important communicable and non-communicable diseases in daily basis for six month. Active case management, strengthened by participation of

Community Health Volunteers (CHV), recovering the cold chain and vaccination of <5 yr old for polio and measles were among the control and preventive measures. Golestan floods (2000 and 2005), Zarand earthquake (2004), Lorestan earthquake (2006) and Cyclone Gonu (2007) were the other examples that surveillance system was established immediately after the event, with the help of national experts and local capacities. The recent disasters revealed that the interdisciplinary nature of *environmental health* requires close collaboration among different partners, like MOH&ME, municipality, Water and Wastewater Organization, Iranian Red Crescent Society (IRCS), etc. As part of the response operations to recent disasters, the number of chlorination of drinking water sources (including, piped water and tanks) was 1,143,527 in Bam, 23,807 in Lorestan and 35,891 in Gonu affected area and 3,585 microbial testing of drinking water have been done in Bam, 2,527 in Lorestan and 136 in Gonu affected area. Effective team working of environmental health and disease control has led to prevention of any major outbreaks in the recent disasters, including Bam and Zarand earthquake and Cyclone Gonu. Drought is a common phenomenon in Iran and a threat for people's health. Following the last episode of drought in 2008, MOH&ME conducted surveillance of disease and monitoring of water safety in highly affected areas.

Based on experiences in Rudbar-Manjil earthquake (1990), MOH&ME launched a planned and early intervention in Bam, which delivered *mental health* services to 53,089 affected people (51% coverage), eight month after the earthquake (7). The experience were used in next disasters, like Zarand earthquake (2005), plane crash in the suburbs of Tehran (2005) or school fire in Safilan (2005). Social Welfare Organization with collaboration of Social Welfare and Rehabilitation University was amongst the most active providers of mental health services, including UNICEF (8) and NGOs. Health system has developed the guidelines for *Reproductive Health* and *Nutrition* in emergencies and drew

the attention of health professionals on different aspects of these issues by advocacy and training. As for *Bioterrorism*, MOH&ME has established a specialized committee, equipped the laboratories and published a book entitled as "Bioterrorism" (9).

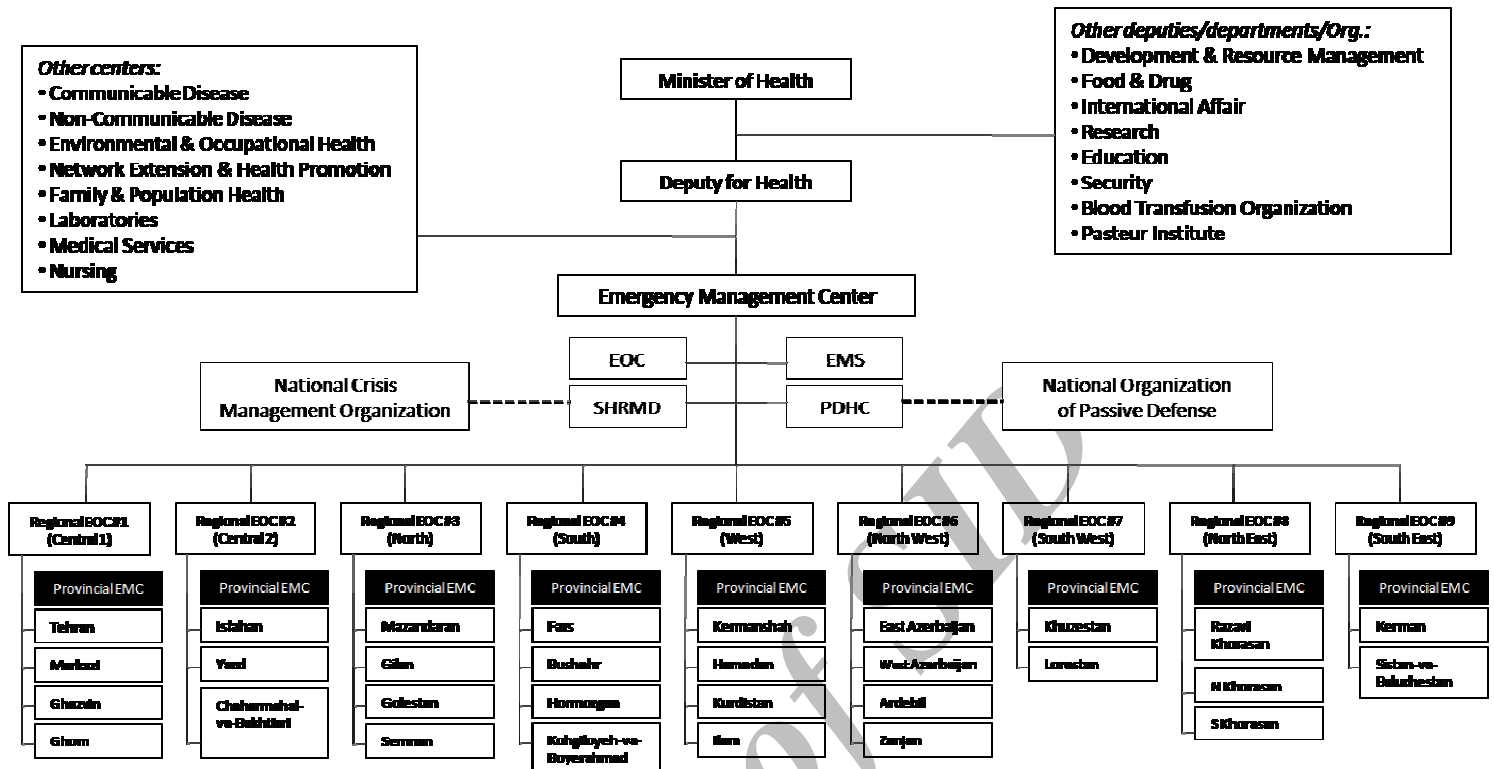
Regarding the *mass casualty management*, the country experienced airlifting of about 12,800 injured in Bam by the army to hospitals around the country. Establishment of triage system in Bam airport was effective to screen the wounded people. To strengthen the pre-hospital capacity, MOH&ME has developed triage and evacuation protocols and increased the number of ambulances and EMS stations to 2.5 and 2.3 times, respectively, from 2003 to 2008. Air ambulance bases are also increased from 1 in 2000 to 11 in 2008. As for provision of on-scene medical services, several field hospitals are provided by national EMC and medical response teams are shaped by Basij of Medical Society Organization. In addition to health system capacities, I.R. Iran Army and Islamic Revolutionary Guards Corps (IRGC) have enormous potential to respond to disasters. Considering the key role of the community as the first respondent (10), BAHĀ (*bahā*) (Basije Hameganie Amoozeshe Ehia) is defined as a public awareness program implementing by EMC that has trained more than 200,000 people around the country on cardiopulmonary resuscitation (CPR).

Regarding the *recovery phase*, the Bam health system seized the opportunity for development following the earthquake, through applying earthquake resistant technology and increasing the number of health facilities than before the event. Destructive flash flood of Golestan (2001) is another example that health system relocated the health houses from flood prone area and bought new buildings for health houses.

Following Bam earthquake several initiatives have been taken in the field of *training and education*. Tehran University of Medical Sciences (TUMS) in 2005, supported by MOH&ME, established "Health in Emergencies & Disasters Department (HEAD)" in School of Public Health

& Institute of Public Health Research, which offers Master of Public Health (MPH) with disaster concentration from 2006. This program has started by Shahid Beheshti and Kerman Universities of Medical Sciences, accordingly. TUMS and MOH&ME have developed a PhD curriculum entitled "Disaster health management", which is under review and they also developed a 3 levels training program entitled "Health Disaster Management and Risk Reduction" with collaboration of WHO supporting by International Association of National Public Health Institute (IANPHI). During recent years, several training workshops have been held by Nursing Department of MOH&ME, Universities of Medical Sciences, PDO and others on the subjects of hospital disaster planning, ICS, public health in disasters, passive defense, etc. From 2003 to 2006, Basij of Medical Society Organization held 3 international congresses, entitled "Health, Medication and Crisis Management in Disasters" and "Health in emergencies and disasters" seminar series was held 21 times from 2005 to Jan 2008, by HEAD and MOH&ME with collaboration of national and international organizations like WHO, ISDR and UNDP.

Relying on the capacity of PHC network, health system initiated community-based disaster management programs to reduce the risk of disasters. "Village Disaster Taskforce" (VDT) model, tested in Golestan province, focused on community participation, down-top approach and facilitation of warning dissemination and communication to grassroots. A community intervention trial showed the effectiveness of the program on the community preparedness at household level ( $P < 0.001$ ). During heavy raining and threat of flood, it was showed that local communication system worked effectively (11). The model was enforced later by MOI as a national guideline, called Village Crisis Committee. Health system contributes also in DAVAM (*davām*), which is a community-based program launched by Tehran Municipality aiming to develop community-based models in Tehran, the Capital city.



**Fig. 1:** Structure of Disaster Health Management in Ministry of Health & Medical Education, I.R.Iran, 2008

\*SHRMD: Secretariat for Health & Risk Management in Disasters, PDHC: Passive Defense Health Committee, EOC: Emergency Operations Center, EMS: Emergency Medical Service, EMC: Emergency Management Center

## Discussion

Bam earthquake significantly accelerated the progress of disaster risk management and preparedness in Iran, including health system. Despite considerable achievements, there are still rooms for improvement. The challenges have been changed during last decade, as disaster health management upgraded from a unit under Center for Environmental Health to Emergency Management Center under deputy of minister, directing national EOC.

Health system has been successfully advocated the health issues to the highest level of country's disaster management. Although it has led to close collaboration of different sectors, but it needs continuous efforts yet.

Coordination has been always a challenge in disaster management (12,13). Health system needs to define the mechanisms for better harmony among partners, through building a trustworthy working environment along with sharing of useful

information. Health system needs to focus on strengthening the information management system, community-based initiatives and integration of disaster health management in Primary Health Care (PHC) network. Disaster risk reduction should be emphasized more and more, while ensuring the highest response capacity with well-exercised plans. Developing a national health disaster plan is recommended. Receiving the reliable and timely warning of hazards is crucial for making the health system ready for effective service delivery at the time of emergency. It needs close collaboration with relevant organization like, Meteorology Organization. Public awareness should be considered as cost-effective approach to build the culture of prevention in the community. Just-in-time education strategy can be considered for this purpose (14). As for education, it seems the country has now an appropriate background to increase the human resource capacity. The system should consider the

quality of competency-based training, while planning for producing the critical mass. Being prepared for donation management, logistic system and supply management should be an area of focus by health system. Effective management of international assistance, especially medical teams needs a comprehensive plan (15) developed by health system and related partners, including Ministry of Foreign Affairs (MoFA). Although the country needs working on intensive risk scenarios like Bam earthquake, increasing number of climatic event needs paying attention to extensive risk management as well. Regarding the research activities, although the number of projects and published articles in indexed scientific journals shows an upward trend, but the Iran's health system needs to invest much more on this important issue. Developing Iran's specific information would enhance the quality of decision-making in health sector.

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