Communicable diseases management in disasters: an analysis of improvement measures since 2005, Islamic Republic of Iran

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Abstract

Background: Due to the importance of managing communicable diseases in disaster situations, the Centre for Communicable Diseases Management (CCDM) within the Iranian Ministry of Health and Medical Education has taken measures to improve routine communicable diseases management systems in normal and emergency situations.

Aims: This study aimed to explore the improvement measures since 2005.

Methods: A qualitative document analysis method was used to analyse all documents related to communicable diseases management from March 2003 to the end of 2014 in the CCDM and on official websites of related organizations.

Results: Seventy-two documents addressing communicable diseases management in disasters were included in the final analysis. The findings were summarized in 4 phases of the disaster management cycle corresponding to 5 core and support functions of the surveillance system.

Conclusions: The findings highlighted improvements in communicable diseases management in disasters, including interorganizational collaboration, information flow and use of new technologies such as web-based or mobile phone-based systems.

Keywords: disasters, communicable disease management, surveillance, outbreaks, Iran

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Introduction

Generally, any kind of man-made or natural disasters result in humanitarian emergencies (*1*). The consequences of such disasters, including displacement of a large number of people; disruption of basic infrastructure and lifelines; overcrowding; increased exposure to disease vectors; food insecurity; and shortages of safe water, sanitation and basic health services facilitate communicable disease epidemics with particularly high morbidity and mortality (*2*). Death rates have been reported to increase by a factor of 10 among displaced populations compared with baseline rates, with communicable diseases being responsible for the majority of deaths (*3*). The Islamic Republic of Iran is affected by a number of man-made and natural disasters, placing it among the areas with a high prevalence of disasters (*4*) and the probability of epidemic communicable diseases.

The *International Health Regulations (2005)* and the subsequent guidelines and scientific documents have emphasized the importance of communicable disease control (*5*). In addition, the new approach has affirmed the importance of surveillance core and support functions in all 4 phases of the disaster management cycle. This approach has highlighted case detection, reporting, investigation/confirmation, analysis/interpretation and actions (control/response, policy and feedback) as core functions, and the setting of standards, training and supervision, setting up laboratory support, setting up communications and resource management as support functions (*6*).

Communicable diseases control programmes started more than 70 years ago in the Islamic Republic of Iran and, in accord with international developments, have gone through many revisions. Before the release of the *International Health Regulations (2005)* (*5*), the Bam earthquake of 2003 was the focal point of the new approach for the country's communicable diseases management in disasters. On 27 December 2003, the ancient city of Bam experienced one of the worst natural disasters since the previous century (*7*). The first communicable diseases control programme in disasters was launched in the earthquake-stricken areas with the emphasis on communicable diseases control, yet routine surveillance had some shortcomings (*8*). It should be noted that a pre-disaster surveillance system already existed in the country but it was not properly prepared for disaster situations. In fact, current health systems in disaster-affected areas show that the pre-existing surveillance system was quite inefficient (*9*). Therefore, communicable diseases surveillance contingency plans for disasters are a necessity (*10*).

The Centre for Communicable Diseases Management (CCDM) in the Ministry of Health and Medical

Education is the ultimate decision-making and planning authority in the area, and has issued many guidelines and regulations with the assistance and cooperation of other health authorities to improve and empower the existing disaster surveillance system. The present study aims to explore how the country's communicable diseases management has improved since its inception.

Methods

The qualitative document analysis method (*11*) was used for analysing the existing documents in the CCDM. All types of hard copy or electronic documents, including books, guidelines, reports (conference papers, training, exercises, operational reports), interviews, correspondence, government documents, laws or regulations, newspaper articles and films or broadcasts in Farsi or English that were related to communicable diseases control and management in disasters from March 2003 to the end of 2014 were reviewed. Additionally, the official websites of the Iranian Islamic Parliament, the Ministry of Health and Medical Education and the Iranian Red Crescent Society were searched for relevant documents. The key terms for searching websites were "communicable disease" or "infection" and "surveillance" or "control" and "emergencies" or "disaster". For those documents that were not directly retrievable from websites the researchers referred to the secretariat and the archive centres of the related organizations or ministries to obtain the required materials. The inclusion criteria were: produced in English or Farsi from March 2003 to the end of 2014, relevance to communicable diseases control, management or surveillance and disaster.

All data extracted from the included documents were put into analysis sheets (Table 1), which were then evaluated and confirmed by the research team epidemiologist using the content validity assessment method (*12*). The analysis sheet consisted of 11 items using data compiled from the documents. We recorded the frequency of each item in relation to year and place of document in the disaster management cycle across all content.

Documents were analysed regarding the inclusion of surveillance definition and communicable diseases control in the 4 phases of disaster management. Subsequently, the information in the document analysis sheets was grouped using the content analysis method in *Maxqda*, version 12, and analysed using *SPSS*, version 14. "Enhancing transparency in reporting the synthesis of qualitative research" (ENTREQ) was used for presenting strategy guidelines (*13*).

Results

Documents

In total, 2256 pages of 131 documents were reviewed. Initially, 93 documents were included. However, 21 documents did not address the research topic and were excluded (Figure 1). All the 72 remaining documents addressed, either directly or indirectly, the surveillance and communicable diseases management during the 4 phases of the disaster management cycle. The study findings were summarized in the 4 phases (mitigation–prevention, preparedness, response and recovery) according to 5 core (case detection, reporting, investigation and confirmation, analysis and interpretation, and action) and support (setting of standards, training and supervision, setting up laboratory support, setting up communications and resource management) functions of the surveillance system (Table 2).

The number of documents generated relating to the management of communicable diseases in the years under study has grown more or less progressively from 1 in 2003 and 2007 to a maximum of 24 in 2013.

Although content such as guidelines for all phases of the disaster management cycle in primary years and field reports from the response phase in subsequent years were more prominent, there were documents covering all phases of the cycle.

There were both weaknesses and strengths in communicable diseases management in disasters; these are detailed in Table 3. The situation was partly resolved by establishing a national disaster risk reduction plan as well as by developing regulations and related guidelines and planning for the provision of resources.

The changes and improvements in communicable diseases management over the 10 years of the study, based on the 4 phases of the disaster management cycle are detailed below.

Mitigation–prevention, preparedness

Case definition

The main diseases with the potential to produce epidemics include cholera, measles, meningococcal meningitis, shigellosis, cutaneous and visceral leishmaniasis, viral haemorrhagic fever, plague, influenza, malaria, typhus, relapsing fever (*Borrelia recurrentis*), hepatitis A and E, typhoid and yellow fever and were therefore included in routine surveillance systems. In accordance with the limitation of case-specific definition and detection, especially in disasters and emergencies, a syndromic surveillance system with definitions for 14 syndromes was confirmed. Definitions for: severe acute respiratory illness, chronic cough syndrome, fever with bleeding syndrome, fever with skin rash syndrome, acute watery diarrhoea syndrome, bloody diarrhoea syndrome, fever with meningeal symptoms, undifferentiated fever, food intoxication, acute flaccid paralysis, shock syndrome, icter syndrome, influenza-like syndrome, and sudden or unexpected death were established and distributed for rapid detection, early notification and early intervention. These definitions were integrated into primary health care services and family physician reference materials. Zero reporting is also mandatory.

Table 1. Document analysis sheet

Document No.:……
Type
☐ Newspaper ☐ Map ☐ Advertisement ☐ Mail Telegraph ☐ Seminar report ☐ Invent register ☐ Press ☐ Note ☐ Report Other
The unique physical characteristics of the document
☐ Interesting header ☐ Annotation ☐ Handwritten ☐ Received (postal) stamp ☐ Typed ☐ Sealed ☐ Other :
3- Date:
4- Author (originator) of document:
5- Subject:
6- Position (job or academic title):
7- The document was written for whom?
8- If you have access to electronic resources, write address:
9- Document description(A–E):
(A) Key things that you think the writer has mentioned:
(B) Why do you think this document was written?
(C) What reason guided you to the aim of the document? (Quote from the document):
(D) Important things that matter to you at the time of writing the document:
(E) Comments for author of document regarding unanswered questions:
10- Strength of document:
11- Weakness of document:

Setting of standards

Standard definitions; training and exercise protocols; standard educational materials; documentation for laboratory, supplies and necessary equipment standards; organized reporting with mandatory zero reporting; standard communication devices; and evaluation standards were prepared and released as the emergency response plan, i.e. the National Public Health Emergency Operation Plan (also known as the Emergency Operation Plan), in the middle of the study period. Risk assessment and a risk map of health facilities were produced as reference maps in all universities.

Training, exercise and drills

In line with the Emergency Operation Plan, training sessions, exercises and drills were performed in universities and at national level to improve the coordination and skills of team members and to identify and address weak and strong points. Exercises were performed with the participation of all members of the health work group to improve inter-agency coordination.

Policy-making

In accordance with the *International Health Regulations (2005)* and the World Health Organization, legislation and regulations were adopted in the health sector at national, provincial and university levels. The National Disaster Management Organization also published regulations to improve coordination in action by governmental and nongovernmental organizations. For this purpose, the Emergency Operation Centre was set up in universities and the Ministry of Health and Medical Education as local and national authorities of the health sector.

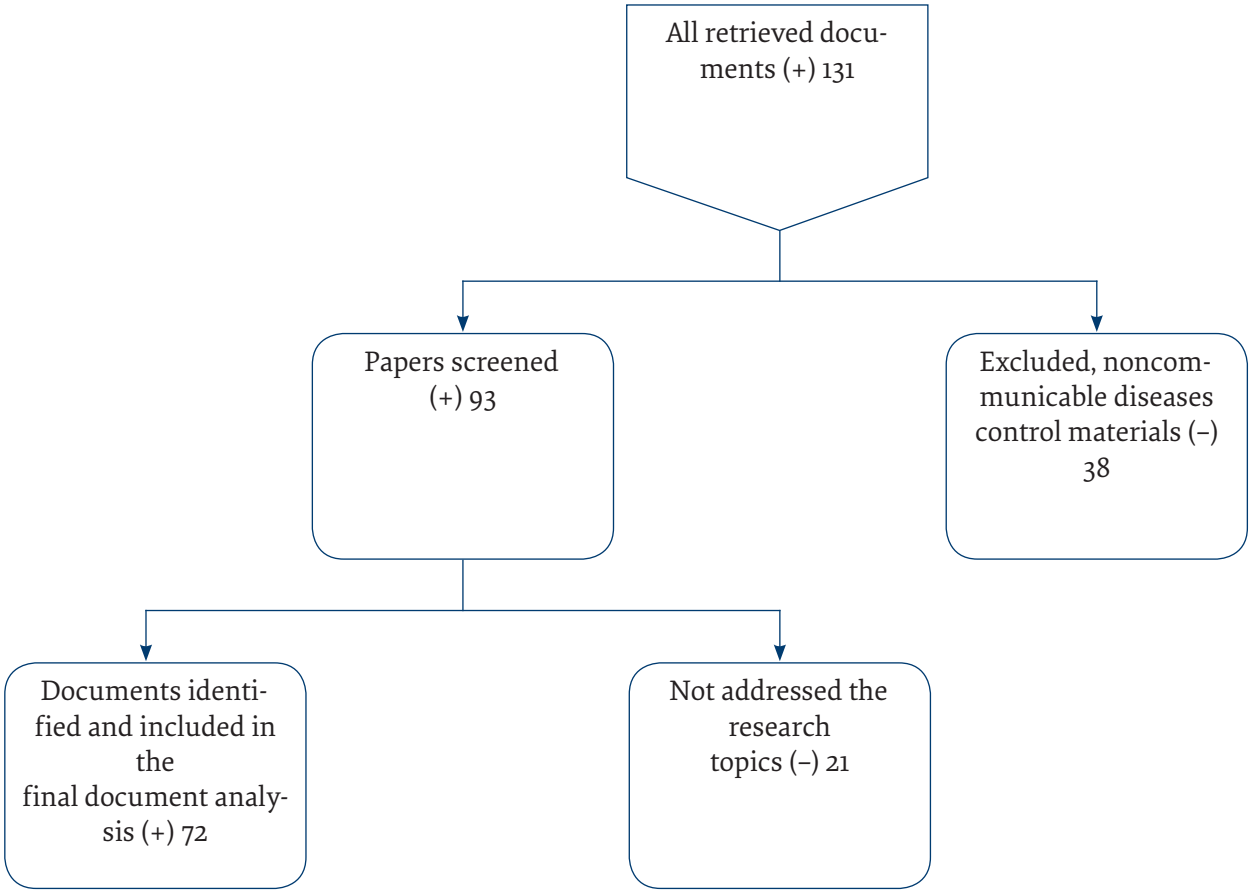

Figure 1. **Document analysis process**

Response

Investigation and confirmation

Outbreak investigations or rapid health assessments were carried out within 2–3 days of a disaster by a standard team comprising specialists in the related sectors (general physicians, obstetricians/nurses, environmental health and disease control technicians/specialists) with rapid laboratory kits, primary equipment and sample collection tools in accordance with the Emergency Operation Plan. The communicable diseases surveillance system was designed to detect and monitor diseases/syndromes in the affected areas.

Analysis, interpretation, report and feedback

Having information about the prevalence of diseases over the same period in previous months or years is very helpful in determining epidemic thresholds (the number of cases that can produce an outbreak) in a disaster-affected population. The first step in interpretation and confirmation of an outbreak of unknown origin is assessment of the available clinical and epidemiological information. Endemic disease status and information on previous seasonal epidemics are available in the CCDM. Communications and reports were 2-sided, meaning that the data were collected from field health teams and interpreted and analysed in the regional health centres and then sent to the Emergency Operations Centre and the health centre of the provincial university. Finally, information was sent to the end point for information collection, the CCDM in the Ministry of Health and Medical Education. Feedback is provided at each stage during this process, and continues to be given on a daily basis. The Emergency Operation Plan forms were used to record data and distribute information.

Control

It may not always be possible to determine the exact cause in the early stages of an outbreak in the aftermath of natural disasters. In such a situation using syndromic surveillance, general control measures based on the probable cause of the outbreak were carried out for primary control. In later stages, when the causative agents become clear, specific measures may be carried out. Four main actions can be performed: preventing exposure (by eliminating the possible source of the disease), preventing infection (protecting sensitive groups, including immunization and primary hygiene services), preventing disease (chemoprophylaxis early treatment) and preventing death.

Table 2. **Findings of document analysis, 2003–2014** ***(continued)***

No.	Author, designation, institution	Subject	Year	Audience	Place in the disaster management cycle
1	CCDM in cooperation with Kermanshah University of Medical Sciences and Health Services	Guide to disease surveillance systems in disaster	2003	Universities and relevant ministerial departments and responsible partner organizations	All phases
2	Secretariat Task Force on health in disaster with collaboration of Kermanshah University of Medical Sciences and Health Services	General health threats in disaster	2005	Universities and relevant ministerial departments and responsible partner organizations	All phases
3	MA Connolly Farsi Translation: MM Gouya, M Soroush, A Omidvarinia, M Hemmati, et al Centre for Communicable Disease Management, Ministry of Health and Medical Education	Communicable diseases control in emergencies: a field manual	2005	Universities and relevant ministerial departments and responsible partner organizations	All phases
4	Islamic Parliament Research Centre, Parliament of Islamic Republic of Iran	Disaster Management Act	2007	All country and regional role playing organizations	All phases
5	SH Emami Razavi, Deputy of Health, Ministry of Health and Medical Education	Mandatory Reporting to Emergency Operation Centre of Ministry of Health and Medical Education	2008	Universities and relevant ministerial departments and responsible partner organizations	All phases
6	SM Alavian, Health Deputy, Iran Ministry of Health and Medical Education	Lessons learned from Cyclone Gonu	2008	All country and regional directors	All phases
7	GR Haghighi Deputy of Health, Zahedan University of Medical Sciences	performance report on Bampour flood disaster	2008	Iran CCDM	Response
8	GR Haghighi, Deputy of Health, Zahedan University of Medical Sciences	Report measures taken in the wake of heavy rainfall and flooding in Sistan and Baluchestan	2008	Iran CCDM	Response
9	GR Haghighi, Deputy of Health, Zahedan University of Medical Sciences	Health Measures Instructions During Floods	2008	Administrator of all health networks, Sistan and Baluchestan Province	Response
10	Iran CCDM	Report the latest flood situation in Sistan and Baluchestan with Summarizing Report of Province the Emergency Operation Centre	2008	Deputy of Health, Ministry of Health and Medical Education	Response
11	F Bidarpour, Deputy of Health, Kurdistan University of Medical Sciences	The Report of First Health Exercise	2008	Deputy of Health, Ministry of Health and Medical Education	All phases
12	H Jafarzadeh, Deputy of Health, Ardabil University of Medical Sciences	Reporting zero case in the Khalkhal Hashtjin earthquake area	2008	Deputy of Health, Ministry of Health and Medical Education	Response
13	SH Emami Razavi, Deputy of Health, Ministry of Health and Medical Education	Mandatory Reporting to Emergency Operation Centre of Ministry of Health and Medical Education	2008	Iran CCDM	All phases
14	N Nikparast, Deputy of Health, Mashad University of Medical Sciences	Report of measures taken in city flood of Bojnoord	2008	Iran CCDM	Response

Table 2. **Findings of document analysis, 2003–2014** ***(continued)***

No.	Author, designation, institution	Subject	Year	Audience	Place in the disaster management cycle
15	A Hasani, Head of Centre for Disaster Management and Medical Emergencies, Ministry of Health and Medical Education	The third session report of the workshop on national project guidelines for service package for disaster preparedness	2008	Deputies and managers of the Ministry of Health and Medical Education	All phases
16	M Soroush, Head Surveillance Bureau, Iran CCDM, Ministry of Health and Medical Education	Health rapid response teams configuration and tasks in heterogeneous wars and disaster	2008	Participants in health in heterogeneous wars and disaster conference	Response
17	SH Emami Razavi, Deputy of Health, Ministry of Health and Medical Education	The activities of the Centre for Disease Control in 4 response levels: National, Pole, Provincial and County	2009	Iran CCDM	All phases
18	M Soroush, Head Surveillance Bureau, Iran CCDM, Ministry of Health and Medical Education	Duties of the Ministry of Interior in communicable diseases control	2009	Presentations session in Ministry of Interior	All phases
19	MM Gouya, Director of Centre for Communicable Diseases Management, Ministry of Health and Medical Education	Pakistan flood risks	2010	Deputy of Health, Ministry of Health and Medical Education	Preparedness and mitigation
20	Deputy of Health, Kerman University of Medical Sciences	Necessary measures in earthquake-stricken areas	2010	Head of health network, Reagan city	Preparedness and mitigation, Response
21	MM Gouya, M Soroush, A Omidvarinia, M Zahraei, A Raeisi, A Sedaghat Centre for Communicable Disease Management, Ministry of Health and Medical Education	National Communicable Diseases Operation Plan in Disaster and Emergencies	2011	Universities and relevant ministerial departments and responsible partner organizations	All phases
22	MM Gouya, Director of Centre for Communicable Diseases Management, Ministry of Health and Medical Education	Report of visit the earthquake region of Mamasani city in Fars province	2011	Deputy of Health, Ministry of Health and Medical Education	Response and Recovery
23	M Aghazadeh, M Mafi, Centre for Communicable Disease Management, Emergency Headquartered of Environment and Labour Health Centre, Ministry of Health and Medical Education	Report from the Flood affected areas of Kelardasht in Mazandaran Province	2011	Deputy of Health, Ministry of Health and Medical Education	Response
24	A Ardalan, MJ Moradian, MM Gouya, K Naddafi, ME Motlagh, Z Abdollahi, et al Disaster Management and Risk Reduction Unit, Department for Public Health, Disaster Public Health Committee, Task force of Health in Disaster and Emergencies, Ministry of Health and Medical education	National Public Health Disaster and Emergency Operation Plan	2011	Universities and relevant ministerial departments and responsible partner organizations	All phases
25	A Reisi, M Zahraei, M Soroush, M Shirzadi, A Sedaghat, H Masoumi Asl, et al CCDM, Ministry of Health and Medical Education	A Comprehensive Guide for communicable diseases surveillance system for family physicians	2012	Universities and relevant ministerial departments and responsible partner organizations	All phases
26	S Eayar, Deputy of Health, Ilam University of Medical Sciences	Report on Measures in Earthquake affected areas in Abdanan	2012	Iran CCDM	Response
27	MM Gouya, Director of Centre for Communicable Diseases Management, Ministry of Health and Medical Education	Syndromic surveillance system of national and international needed in the implementation of the International Health Regulations	2012	Universities and relevant ministerial departments and responsible partner organizations representatives in meeting	All phases

Table 2. **Findings of document analysis, 2003–2014** ***(continued)***

No.	Author, designation, institution	Subject	Year	Audience	Place in the disaster management cycle
28	AR Mesdaghinia, Deputy of Health, Ministry of Health and Medical Education	The necessary measures in Eastern Azerbaijan earthquake	2012	A Ardalan, Health Deputy Counsellor and Head of Disaster Risk Management Unit	Response
29	M Soroush, Head Surveillance Bureau, Iran CCDM, Ministry of Health and Medical Education	Analysis of earthquake affected situation in east Azarbaijan Quoted from Young Journalist club reported by Asriran News Agency	2012	MM Gouya, Director of Centre for Communicable Diseases Management, Ministry of Health and Medical Education	Response
30	Javad Nouaallahi, Deputy of Health, Ilam University of Medical Sciences	Environmental health emergency vigilance performance report	2012	Deputy of Health, Ministry of Health and Medical Education	Preparedness
31	A Hasani, Head of Centre for Disaster Management and Medical Emergencies, Ministry of Health and Medical Education	Announce some issues related to emergency and passive defence	2012	Public awareness through Iranian Students News Agency	Preparedness
32	SM Dastour, Head of Veterinary Organization	Report on veterinary services and activities in the Eastern Azerbaijan earthquake	2012	Minister of Agriculture	Response
33	SM Dastour, Head of Veterinary Organization	The report of subsequent measures taken in East Azerbaijan earthquake	2012	Minister of Agriculture	Response
34	M Mirzaei, Deputy of Health, Mazandaran University of Medical Sciences	Briefings the measures taken following flood of Noshahr and Chaloos	2012	Centre for Communicable Disease Management, and Environment and Labour Health Centre, Ministry of Health and Medical Education	Response
35	National Disaster management Organization. In: National Disaster management Organization, Ministry of Interior 2012	Tasks of health sector specialized working group in unexpected events and disaster	2012	Ministry of Health and other member organizations in health disaster working group	All phases
36	M Soroush, Head of Surveillance Bureau, Iran CCDM, Ministry of Health and Medical Education	Report on earthquake-stricken areas of Eastern Azerbaijan	2012	CCDM	Response
37	A Reisi, M Zahraei, M Soroush, M Shirzadi, A Sedaghat, H Masoumi Asl, et al. CCDM, Ministry of Health and Medical Education	A Comprehensive Guide for communicable diseases surveillance system for family physicians, 1st ed.	2012	All general practitioners	All phases
38	K Mehdizadeh, Deputy of Health, Birjand University of Medical Sciences	Field visit report of flood-hit areas covered by the Sarbishe health network	2013	CCDM	Response
39	A Khajeh Nian, Deputy of health, Bushehr University of Medical Sciences	Report on activities carried out in Bushehr earthquake	2013	Deputy of Health, Ministry of Health and Medical Education	Response
40	Specialized group of disease response and prevention, Deputy of Health, Qazvin University of Medical Sciences	Report of rapid response teams' exercise	2013	CCDM	Preparedness
41	Manager of Disaster and Medical Emergencies of Bam city, Bam University of Medical Sciences	Report of damage after the flood in Tilek-Asfykan of Bam city	2013	Emergency Operations Centre of Tehran Emergency Centre	Response
42	Seyedi. Manager of Disaster and medical emergencies, Jiroft University of Medical Sciences	Report of the flood and waterlogging in city of Jiroft	2013	Centre for Disaster Management and Medical Emergencies	Response
43	Manager of Centre for Disaster Management and Medical Emergencies, Kerman University of Medical Sciences	A report of recent floods and rainfall in Kerman province	2013	Centre for Disaster Management and Medical Emergencies	Response

Table 2. **Findings of document analysis, 2003–2014** ***(continued)***

No.	Author, designation, institution	Subject	Year	Audience	Place in the disaster management cycle
44	MM Gouya, Director of Centre for Communicable Diseases Management, Ministry of Health and Medical Education	Bam and Jiroft flooding	2013	Deputy of Health, Bam and Jiroft University of Medical Sciences	Response
45	F Rakhshani, Health Deputy, Zahedan University of Medical Sciences	Flooding in Sistan and Baluchestan province	2013	Governor of Sistan and Baluchestan province	Prevention, response
46	SM Tabatabaei, Deputy of Health, Zahedan University of Medical Sciences	A report of primary measures to control flood disaster	2013	Centre for Communicable Disease Management, and Environment and Labour Health Centre, Ministry of Health and Medical Education. Iran National Disaster Management Organization	Response
47	SM Tabatabaei, Deputy of Health, Zahedan University of Medical Sciences	A report of subsequent measures to control flood disaster	2013	Centre for Communicable Disease Management, and Environment and Labour Health Centre, Ministry of Health and Medical Education. Iran National Disaster Management Organization	Response
48	SM Tabatabaei, Deputy of Health, Zahedan University of Medical Sciences	A report of measures to control flood disaster consequences	2013	Centre for Communicable Disease Management, and Environment and Labour Health Centre, Ministry of Health and Medical Education. Iran National Disaster Management Organization	Response
49	SM Tabatabaei, Deputy of Health, Zahedan University of Medical Sciences	A report of measures taken in flood disaster	2013	Centre for Communicable Disease Management, and Environment and Labour Health Centre, Ministry of Health and Medical Education. Iran National Disaster Management Organization	Response
50	F Rakhshani, Deputy of Health, Ministry of Health and Medical Education	The implementation of disaster risk assessment programme in health networks	2013	Health Deputy of all medical universities in the Islamic Republic of Iran	Mitigation and prevention
51	MT Talebian, Head of Disaster Management and Medical Emergencies Centre, Ministry of Health and Medical Education	Report of problems caused by the outbreak of water-borne and food-borne diseases in Yazd province	2013	Preparedness and response deputy, Iran National Disaster Management Organization	Response
52	K Naddafi, Head of Environment and Labour Health Centre, Ministry of Health and Medical Education	A report of the assessment team dispatched from the Ministry of Health to Yazd	2013	Deputy of Health, Yazd University of Medical Sciences	Response
53	K Naddafi, Head of Environment and Labour Health Centre, Ministry of Health and Medical Education	Proceedings of outbreak investigation in Yazd province	2013	Director and Chairman of the Board of Water and Wastewater Engineering Company	Response
54	AR Moraveji, Deputy of Health, Kashan University of Medical Sciences	Report on water and food-borne outbreaks in Abu Zeid Abad of Aran and Bidgol county	2013	Centre for Communicable Disease Management, Ministry of Health and Medical Education	Response
55	MM Gouya, Director of Centre for Communicable Diseases Management, Ministry of Health and Medical Education	Eltor report	2013	Deputy of Health, Ministry of Health and Medical Education	Response
56	Deputy of Health, Zahedan University of Medical Sciences	A report of cholera control activities	2013	CCDM Ministry of Health and Medical Education	Response
57	MM Gouya, Director of Centre for Communicable Diseases Management, Ministry of Health and Medical Education	Report of cholera control team activities in the Sistan and Baluchestan	2013	Deputy of Health, Ministry of Health and Medical Education	Response

Table 2. **Findings of document analysis, 2003–2014 *(concluded)***

No.	Author, designation, institution	Subject	Year	Audience	Place in the disaster management cycle
58	A Ardalan, Deputy of Health Counsellor and Head of Disaster Risk Management Unit, Ministry of Health and Medical Education	A report of natural hazards occurrence in Iran	2013	Deputy of Health, Ministry of Health and Medical Education	Preparedness
59	AA Rezaei, General Directorate of Animal Health and Disease Management, Ministry of Agriculture	Necessary measures in the earthquake affected areas of Borazjan	2013	General Director of Veterinary Medicine, Bushehr Province	Response
60	AM Khajeheian, Deputy of Health, Bousehr University of Medical Sciences	Description of the current situation, the initial assessment and health measures in the affected area of Dashtestan	2013	Deputy of Health, Ministry of Health and Medical Education	Response
61	K Naddafi, Head of Environment and Labour Health Centre, Ministry of Health and Medical Education	A brief report of the review mission on respiratory disease in Ahvaz	2013	Deputy of Health, Ministry of Health and Medical Education	Response
62	MM Gouya, Director of Centre for Communicable Diseases Management, Ministry of Health and Medical Education	Rapid assessment of the earthquake affected area in the county of Bastak	2014	Deputy of Health, Ministry of Health and Medical Education	Response
63	A Vahidi, Deputy of Health, Kerman University of Medical Sciences	Instructions of response to flood	2014	Administrator of all health networks in Kerman province	Response
64	SH Hashemi, Minister of Health and Medical Education	Warning about Eltor	2014	Minister of Interior	Preparedness and response
65	M Araabi, Deputy of Health, Mazandaran University of Medical Sciences	Request of equipment and funding for responding to cold wave disaster	2014	CCDM, Ministry of Health and Medical Education	Response
66	AA Sayyari, Deputy of Health, Ministry of Health and Medical Education	Recalling things to apply in cold wave disaster management	2014	Health Deputy of Mazandaran and Gilan universities of medical sciences	Preparedness and response
67	K Naddafi, Head of Environment and Labour Health Centre, Ministry of Health and Medical Education	Intensify supervision on water facilities and food storage and distribution centres	2014	Deputy of Health of all universities of medical sciences in Islamic Republic of Iran	Prevention
68	M Araabi, Deputy of Health, Mazandaran University of Medical Sciences	A report of measures taken in cold wave disaster	2014	Deputy of Health, Ministry of Health and Medical Education Chancellor of Mazandaran University of Medical Sciences	Response
69	A Ardalan, Deputy of Health Counsellor and Head of Disaster Risk Management Unit, Ministry of Health and Medical Education	General recommendations related to the snowfall disaster	2014	Deputy of Health of all universities of medical sciences in Islamic Republic of Iran	Preparedness and response
70	K Mehdizadeh, Health Deputy, Birjand University of Medical Sciences	A report of most important actions taken in Tabasyn flood, Nehbandan county	2014	Centre for Communicable Disease Management, Ministry of Health and Medical Education	Response
71	K Mehdizadeh, Deputy of Health, Birjand University of Medical Sciences	Daily report of number of patients affected by the disaster in the Tabasyn flooded area, Nehbandan county	2014	CCDM, Ministry of Health and Medical Education	Response
72	MM Gouya, Director of Centre for Communicable Diseases Management, Ministry of Health and Medical Education	The initial assessment of the disaster-affected area of Musian	2014	Head of Environment and Labour Health Centre, Ministry of Health and Medical Education	Response

CCDM = Iranian Centre for Communicable Diseases Management.

Table 3. **Weaknesses and strengths of communicable diseases management in disasters**

Weaknesses/problems	Strengths
• Safety and security of staff and health facilities • Health facility vulnerability • Basic requirements and tools scarce • Interacting with the media • Access to affected areas • Span of control in operation area • Reporting weakness (communication) • Information management and documentation • correct indicators (lack of denominator) • Inter organizational coordination • Evaluation and performance assessment • Equipment and diagnostic facilities • Job description or transparency in duties (inter-organizational) • Nonparticipation of staff	• Operation plan • Training and exercise • Monitoring and vertical supervision • Logistics • Active and continuous surveillance system • Vector control programme • Contingency planning • Information management system • Intra organizational coordination

Setting up laboratory support

Confirmation of probable case/syndrome to define the disease agent needs laboratory services. According to the Emergency Operation Plan, essential laboratory services are deployed on-site with the support of advance laboratory services at the provincial and national level. Rapid diagnostic kits have been used in recent years for outbreak investigation.

Setting up communications

Stable and appropriate communications are an important component of a communicable diseases surveillance system in disasters. With the mobile networks distributed in recent years, information is transferred in a timely manner, but back-up communication is essential.

Coordination

In keeping with laws and regulations announced by the National Disaster Management Organization to improve coordination in action, coordination among the organizations involved has improved but is still not satisfactory.

Resource management

Since communicable diseases management is an ongoing and enduring process, providing sustainable resources is one of the main concerns. Collaboration and sharing of resources among all responsible organizations is critical to a sustainable supply chain. The issue has been the subject of laws and regulations promulgated by the National Disaster Management Organization to relevant authorities, and by the Ministry of Health and Medical Education to universities and local and national health organizations.

Recovery

In accordance with the Emergency Operation Plan, the final point of response and the instigation of recovery is shifting from emergency surveillance systems to routine surveillance systems, reconstruction of health facilities and re-implementation of routine health services.

Discussion

The aim of this study was to review the Islamic Republic of Iran's communicable diseases management specification and improvement in disaster management from documents published during 2003–2014. The main issues included the identification of partners; policy planning for health management in disasters; early warning of hazards; training and simulation; cooperation with the media; safety and security of health facilities and staff; transparency in describing tasks; search and evacuation capacity; safe water and sanitation; rescue and relief; health preparedness; health response planning; policy support; efficiency and sustainability of the supply chain; risk assessment and vulnerability analysis; defects in cooperation and coordination; outbreak management; resource mobilization; information management and documentation. These were addressed in primary documents from 2003, and indicated a need for improved communicable diseases management.

In line with changes enacted internationally, and using existing guidance from the World Health Organization, measures have also been made towards improving communicable diseases management in the Islamic Republic of Iran. One of the most important points of the system development was the change in case definition to syndrome. Simple learning of the syndromic surveillance for health staff, rapid implementation with minimum facilities and there being no need for extra cost are advantages of the establishment of syndromic surveillance. Another advantage is its adaptation to the routine surveillance system in the country, and familiarity with syndromic surveillance helped inspire health staff to act more skilfully and efficiently. Nevertheless, there were weaknesses in syndromic surveillance, for example a non-estimated denominator, lack of participation of the private sector and general hospitals, nonparticipation of staff, poor intersectoral collaboration and inconsistency of data collection tools. These findings were similar to another study of the East Azerbaijan earthquake to examine strengths and weaknesses of the communicable diseases surveillance system in disaster-affected areas (14).

Another major problem of implementing the surveillance system was lack of agreement on case definitions for monitoring diseases among physicians, especially in the private sector. Although there are some problems in the establishment of syndromic surveillance, its success and effectiveness is confirmed in many disaster-affected areas within different contexts (*14*,*15*,*16*). Routine surveillance systems that are supposed to be involved in patient care at the start of syndromic surveillance in disaster-stricken areas should have the use of advanced technology but these are extremely vulnerable to the effects of disasters. Considering this problem, the introduction of simple disease surveillance, such as syndromic surveillance, following a disaster can be useful. After a disaster has occurred, syndromic surveillance should be initiated and tailored to the local setting (*17*).

Another problem in the current situation was documentation and registration systems. Data were collected, registered and reported manually, which could introduce human error (*18*). Although advanced technology such as web-based registration has some advantages, e.g. increased coverage, accuracy and timeliness of data collection and instant feedback, the disruption of telecommunications infrastructure and failing computers creates too high a risk (*19*). According to advanced mobile networks in the Islamic Republic of Iran, mobile-based surveillance systems for sending data and monitoring communicable diseases, which has seen success in other countries (*20*,*21*,*22*) using a geographical information system to identify disease distribution, could be useful (*23*).

Intra-organizational collaboration with the implementation of the Public Health Emergency Operation Plan showed little improvement. Despite notification of the comprehensive Rescue and Relief Act that was approved by the Iranian Council of Ministers (Article 44 of the Third Economic, Social, and Cultural Act of the Islamic Republic of Iran, approved in 2000 and regulated by the National Disaster Management Organization), interorganizational cooperation issues still remain. These communication and coordination problems between role player organizations are similar to those experienced in other countries (*24*,*25*). Perhaps a helpful action to resolve this problem would be legal penalties for noncooperating organizations. This requires the establishment of a performance assessment system to determine the failure of partner organizations as developed by Babaie et al. in recent research in CCDM (*26*). This is a very important step since successful control and management of communicable diseases requires the cooperation and support of all organizations involved in health (safe water and food, vector control, security at the scene, lifelines, basic supplies, etc.).

Laboratory support for communicable disease surveillance is usually severely limited in disasters and the existence of a mobile laboratory with proper facilities at the time of disasters in the affected area has long been a problem (*27*). Although rapid diagnostic kits have been used in recent years for outbreak investigation in the Islamic Republic of Iran for many infectious agents, access to advanced laboratory services on-site remains an issue. Transferring samples to provincial and national referral laboratories and receiving feedback has an adverse effect on the management of communicable diseases through time wasting.

In the field of resource management, a speedy response to health-related needs immediately after natural disasters through efficient emergency logistics distribution and resource management is vital for the alleviation of disaster impact in the affected areas. Although the National Disaster Management Organization emphasized this issue, measures taken have been inadequate. A hybrid clustering–optimization approach to the operation of emergency logistics distribution might be a solution (*28*).

Conclusion

The established communicable diseases management functioned well in controlling communicable diseases in disasters in the Islamic Republic of Iran, and could be usable for other low- and middle-income countries. Many problems have been resolved, including preparing guidelines, training materials, training courses, exercises and coordination of units in the Ministry of Health and Medical Education. However, there were some weaknesses in current communicable diseases management in intra-organizational cooperation in the Ministry of Health and Medical Education and interorganizational cooperation at the national and provincial level and this needs further development. Lack of coordination among external organizations, comprehensive support systems, external monitoring and evaluation, reliable communications, and timely action of all responsible organizations are the main issues. Inter-agency coordination could be improved to some extent by changing the current disaster management legislation to a service-based approach (*29*), i.e. an organization-centred approach.

Considering the Islamic Republic is among the top 10 countries vulnerable to natural hazards, designing an information and communication system for recording and collecting data is essential at the time of any disaster. For better coordination and general improvement, continual retraining and exercises for intra-organizational staff in the Ministry of Health and Medical Education, universities and other organization are suggested.

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Prise en charge des maladies transmissibles en situation de catastrophe : analyse en République islamique d'Iran

Résumé

Contexte : En raison de l'importance de la prise en charge des maladies transmissibles dans les situations de catastrophe, le Centre de prise en charge des maladies transmissibles du ministère de la Santé et de l'Enseignement médical de la République islamique d'Iran a pris des mesures afin d'améliorer les systèmes de prise en charge systématique des maladies transmissibles dans les situations normales et d'urgence.

Objectifs : La présente étude a pour objet d'analyser les mesures d'amélioration prises depuis 2005.

Méthodes : Une méthode d'analyse qualitative a été utilisée pour examiner l'ensemble des documents existants ayant trait à la prise en charge des maladies transmissibles, entre le mois de mars 2003 et la fin de l'année 2014. Ces documents sont disponibles auprès du Centre de prise en charge des maladies transmissibles et via les sites Web officiels des organisations apparentées.

Résultats : Soixante-douze documents relatifs à la prise en charge des maladies transmissibles en situation de catastrophe ont été intégrés dans l'analyse finale. Les conclusions de l'étude ont été résumées en tenant compte des quatre phases du cycle de gestion des catastrophes et des cinq fonctions essentielles et d'appui du système de surveillance.

Conclusions : L'examen des documents a montré des améliorations dans la prise en charge des maladies transmissibles en situations de catastrophe, notamment en termes de collaboration interorganisations et d'utilisation des nouvelles technologies telles que les systèmes basés sur le Web et sur téléphone portable.

علاج الأمراض السارية في حالات الكوارث: دراسة تحليلية في جمهورية إيران الإسلامية

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الخلاصة

الخلفية: نظرًا لأهمية علاج الأمراض السارية في حالات الكوارث، اتخذ مركز علاج الأمراض السارية التابع لوزارة الصحة والتعليم الطبي في جمهورية إيران الإسلامية التدابير اللازمة لتحسين نُظُم العلاج الروتيني للأمراض السارية في الظروف العادية وحالات الطوارئ.

الأهداف: هدفت هذه الدراسة إلى استعراض تدابير التحسين التي تم اتخاذها منذ عام ٢٠٠٥.

طرق البحث: استُخدم أسلوب التحليل النوعي للمستندات في تحليل جميع الوثائق المتعلقة بعلاج الأمراض السارية منذ مارس/ آذار ٢٠٠٣ حتى نهاية عام ٢٠١٤، والمتاحة في مركز علاج الأمراض السارية والمواقع الإلكترونية الرسمية للمنظمات ذات الصلة بالموضوع.

النتائج: أُدرجت اثنين وسبعين وثيقة تناولت علاج الأمراض السارية في حالات الكوارث في الدراسة التحليلية النهائية. ولُخصت نتائج البحث في أربع مراحل لدورة إدارة الكوارث وفقًا للوظائف الأساسية والداعمة الخمسة لنظام الترصُّد.

الاستنتاجات: أشارت الوثائق التي تم مراجعتها إلى التحسينات المُدخلة في علاج الأمراض السارية في حالات الكوارث، بما في ذلك التعاون بين المنظمات، وتدفق المعلومات، واستخدام التقنيات الجديدة مثل النُظُم القائمة على شبكة الإنترنت أو الهواتف المحمولة.

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