

Assessment of Health System in the disaster-affected regions of Kermanshah, Iran (RPPH 18-62)

Iran, Islamic Republic of

SECTION A. GENERAL INFORMATION

- PI name: Dr. Sanaz Sohrabizadeh
- Reporting Period: July to December 2019 (5 months)¹
- Objectives of the study:
 - o General:
 - Assessment of health system functions in the earthquake-affected regions of the Kermanshah province, Iran
 - o Specific:
 1. Assessment of the health system functions in meeting the reproductive health needs of women and men living in the earthquake-affected regions of the Kermanshah province, Iran
 2. Assessment of the health system services in meeting the health needs of children affected by the earthquake in the Kermanshah province, Iran
 3. Assessment of the health system functions in providing healthy water, sanitation and hygiene for the people living in the affected regions of the Kermanshah province, Iran
 4. Assessment of the health system functions regarding the use of trauma kits transported from WHO to healthcare facilities of the earthquake-affected regions in Kermanshah

¹ Due to economic sanction problems, TSA Form was prepared and signed since March 2019 and then the research process was started quickly

SECTION B. TECHNICAL REPORT:

INTRODUCTION:

During recent decades, the world has experienced numerous disasters such as earthquakes, tsunamis, epidemics, droughts, and floods. Post-disaster health challenges may arise as the result of new needs and damaged resources. For example, disrupted water and sanitation infrastructure, insufficient healthcare resources, and food shortages have negative health consequences for affected people. Although health is an essential human right and a fundamental factor for community development, well-being and health of disaster-affected people have been insufficiently considered, particularly in low-income countries (1). Furthermore, disasters disrupt the health systems functions and make the healthcare providers, health facilities and resources inaccessible in the way that the vital health needs of affected people are not met (2-5).

Conducting health interventions to address the health needs and capacities of the affected people, reducing duplicative and ineffective interventions as well as performing the post-disaster recovery of disrupted health systems can be achieved by health system assessment (6). However, the literature reported the lack of monitoring and assessing essential aspects of the health system functions during and after disasters, including reproductive health, environmental health and children health (7-8). For example: investigating the sexual and reproductive healthcare status in the recent disaster-affected regions in Iran explored the issues of violence against women, ignoring male reproductive health as well as lack of planning, training, and monitoring system (9-10). Furthermore, the study of men's and women's health status in the flood- and earthquake-stricken regions of Eastern Azarbaijan, Bushehr and Behshahr reported unhealthy conditions of water, sanitation and nutrition of people living in temporary settlements (1). Children malnutrition and mental disorders issues after the flood and earthquakes were reported in the related evidence as well (11-12). The authors of these studies, suggested and highlighted the necessity of health system assessments of the disaster-affected regions in Iran. In addition, the need for assessment of the children, environment and reproductive healthcare services in the disaster-affected regions was highlighted by several authors as well (13-16).

The earthquake with magnitude of 7.3 Richter killed about 600 citizens and injured about 9000 people living in the affected regions. A total of 427266 people were affected in 8 different cities of Kermanshah province as well (17). After the occurrence of this earthquake, the health services, and subsequently, the measures taken by the Iran Ministry of Health were

reported to the authorities and Vice President of Ministry of Health in the form of internal (intra-organization) reports. A review of these reports reveals that the measures are only accepted in the form of a list of the accomplished tasks, and there is a gap in evaluation, and assessment of these measures (18). The present research aimed to assess the health system functions in providing reproductive, environmental and children healthcare services in the destroyed regions of Keramshah province in Iran.

METHODOLOGY:

Study design

The present study is an observational community-based survey which was conducted in the earthquake-destroyed regions of the Kermanshah province, Iran. The present research project was conducted in 3 phases:

Phase 1: Literature review and qualitative study to identify and explore the important factors for assessment the health system in different aspects of reproductive health, children health, environmental health and WHO trauma kits.

Phase 2: Preparing the first drafts of assessment tools as well as tools validation to assess health system functions in disaster-affected fields along with ensuring all assessment items have been included precisely and accordingly, a comprehensive assessment outputs is gauranteed.

Phase 3: Health system assessment: planning and conducting field-based assessments using both primary and secondary data sources. Both primary and secondary data were collected through two sources. The sources of secondary data included Ministry of Health and Kermanshah University of Medical Sciences. Primary data were gathered through a community-based survey in the affected regions of Kermanshah province.

Research process at the final phase

The present project was conducted through a combination of three stages of comprehensive literature review and data collection from relevant centers, designing a valid and reliable checklist and evaluation of health system performance through a community-based survey. After receiving a letter from the ethical committee of university, searching for relevant documentation and reports at various levels including the Ministry of Health, Universities and health centers active in the area was done in person and by referring to the relevant centers. After identifying the concepts and tool items explored in the first stage, the evaluation

checklist was designed and its validity and reliability were performed. Since the methodology of the first phase of the study was described in the first technical report, the methodology of second phase will be reported as the follow :

- **Tool development**

The tool design conducted in two general stages, each consisting of steps. Instrument design, and judgmental evidence. The two-step Lynn (19) process was used to content validity of the checklist.

Stage 1 - Instrument development

The first step consists of three steps: Domain identification; Item Generation; and Item Construction.

Step 1: domain identification

The first step is the domain identification. Content domain is the content range of variables that can be measured by reviewing literature, interviews, and observations about the variables (20). In these domains and sub-domains, the variables affecting the study were determined.

Step 2: Item generation

At this step, appropriate items for each domain and subdomain were generated and extracted. Qualitative research methods can also be used to determine appropriate structure variables and concepts (21). The qualitative data collected in the conceptual interview with the respondents helps to enrich and develop what has been identified in the concept and is used as a valuable resource for the production of instrumentation (22). In this step, based on the concepts and dimensions obtained from the previous step, relevant studies in the field of health system disaster preparedness were reviewed in related information databases. Also, all tools that measure health system preparedness and its dimensions, especially reproductive health, child health and environmental health were collected. In addition, in this step, expressions were extracted from those tools to be used, along with other preceding step phrases, as initial statements of the checklist.

Step 3: Item Construction

At this step, the items identified in the previous step were collected in a form and then the

checklist was designed based on the items extracted from the previous two steps.

Stage 2 - Expert judgment

This stage requires the approval of a team of experts to demonstrate the validity of the items and the entire content validity of the checklist. At this stage, the checklist was judged by experts, and items were developed to measure the desired variable, including the following steps.

Step 1: Solicit expert participation

In this step, the number of experts involved in the study is stated. The checklist was sent to 12 experts via email as well as in person, which was ultimately judged by 10 experts.

Step 2: A description of the experts (content reviewers) who participated in the study

The checklist was examined by a team of five disaster and emergency health professionals, one humanitarian specialist, two environmental health professionals, one reproductive health specialist, and one child specialist.

Step 3: Identifying aberrant judges

Although experts and judges are selected from the relevant fields, bias may arise from inaccurate judgment resulting in increased measurement error. Thus, any possible misconceptions were eliminated through an agreement between the judges.

Step 4: The analysis of expert ratings

After forming the panel of experts, quantitative and qualitative experts' points of view were used to assess the validity and reliability of the checklist.

Face validity

In face validity, the tool is examined in appearance. This means that the tool must be appropriate and irrational. The higher the face validity has a better acceptance by participants (23). In this study, the face validity of the checklist designed by expert judgment was evaluated. The qualitative method was used to determine face validity in this study. The sample of the study were faculty members, instrument designers and psychotherapists, health professionals in disasters and emergencies.

Content validity

Content validity was quantitatively evaluated using two content validity ratios (CVR) of Lawshe (24) and content validity index (CVI) of Waltz and Bausell (20).

The CVR was used to ensure that the most important and correct content (item necessity) was selected and the content validity index was used to ensure that the checklist items were designed to best measure the content. To determine the CVR, 10 experts were asked to rate the items on a scale of “It is essential,” “It is useful but not essential,” or “It is not essential.” Then, based on the following formula, CVR was calculated: $CVR = (N_e - N/2) / (N/2)$, in which N_e is the number of panelists indicating “essential” and N is the total number of panelists. Based on Lawshe’s table, in order to determine the minimum value of CVR, items with a CVR of above 0.51 were considered significant (25).

To determine the CVI, experts expressed the relevance, clarity, and simplicity of each item on a 4-point Likert-type scale. Experts indicated the relevance of each item using 1 (“Not relevant”), 2 (“Somewhat relevant”), 3 (“Quite relevant”), or 4 (“Highly relevant”). Similarly, simplicity was rated 1 (“Not simple”), 2 (“Relatively simple”), 3 (“Simple”), or 4 (“Completely simple”), and clarity was rated 1 (“Not clear”), 2 (“Relatively clear”), 3 (“Clear”), or 4 (“Completely clear”). Then, based on the following formula, CVI was calculated: $CVI = (\text{Number of judges who rated 3 or 4} / \text{Total number of judges})$. The minimum acceptable value for CVI is 0.79, and if the CVI of an item was below this value, it would be eliminated (21).

Reliability

To determine the Internal consistency reliability of the checklist, the Cronbach's alpha was used. Internal consistency refers to the homogeneity of items, or rather, how much items measure the same attribute and produce consistent results. A reliability coefficient of 0.70 or higher indicates an acceptable level of reliability(23, 26). The sample size of this study to determine the Internal consistency reliability was 15 people affected in earthquake-stricken area. The sample size of the reliability of the instrument is recommended between 15 and 20 samples (26).

- **Health System Function Assessment**

Primary sources :

At next stage, using the designed checklist, the performance of the health system was evaluated with a community-based survey. The study population was active health centers in the region and affected women, men and children in the earthquake-stricken areas of Kermanshah province. To evaluate the performance of the health system, all active health centers in the earthquake area were evaluated. The randomized sampling method was used to selecting the households. A list of those affected households was obtained from the health center of each district, and based on the total population living in that area, a number of households were selected by lottery. Finally, in this community-based survey, 100 households were selected and assessed using the designed health checklist in three dimensions of reproductive health, child health, and environmental health. The data obtained from the second and third steps were analyzed using SPSS software. Cronbach's alpha was used to calculate the internal consistency of the checklist. In the third step, descriptive statistics (frequency distribution and mean) were used.

Secondary sources :

The sources of secondary data included Ministry of Health and Kermanshah University of Medical Sciences. All extracted data were categorized into function, weakness and strenghts items and illustrated in tables based on several time interval after the earthquake.

Ethical considerations:

This study protocol was approved by the ethics committee of the Shahid Beheshti University of Medical Sciences, Tehran, Iran. Based on the approved consent form, all participants were informed about the confidentiality of their names and other private information in the related reports, transcripts, and notes. In addition, the participants were provided the possibility of leaving or declining their own interview session at any time without any repercussions. Furthermore, any dissemination of data must be done with the permission of their related organizations

Activity implementation:

Time period	Activities
March to June 2019- (4 months)	Literature review Qualitative study Review of health system documents Preparing the first draft of assessment tool
June 2019	Submission of the Progress Report
July 2019 (1 month)	Measuring tool validation and Finalization
August to October 2019	Data collection from the affected people Data collection from the local health centers Data analysis
November 2019	Final report preparation
December 2019	Submission of the Final technical and Financial Report

Preliminary Results:

Phase 1: Tool Development

stage1: Designing a checklist

In the first stage of the research, which was done by reviewing different literature and sources, 45 items were extracted. After an agreement, the checklist was categorized into two demographic information sections; and different items were categorized into 3 dimensions of reproductive health, child health, and environmental health. During the item generation step, 14 items were generated and combined with 45 items obtained through the review of similar literature and checklists. After reviewing a number of items were duplicated or overlapped and were removed. In the end, 47 items were left to construct the checklist, and as a result, the original checklist was designed with 47 items in three dimensions of reproductive health, child health, and environmental health (Table 1).

Face validity results of the checklist

To determine face validity, the checklist was provided to 10 experts with experience in the field, including 6 disaster and emergency health professionals, two disaster psychologists, and two instrument design and psychometric specialists. They were asked to judge the simplicity, importance, and clarity of the items. Based on their opinion, some items were adjusted in terms of simplicity, clarity, and importance. At this point 6 items were removed. Finally, 41 items remained after face validity of the checklist.

Stage 2: Judgment of expert panel on the validity and reliability of a designed checklist

In step 2, after selecting 10 experts associated with a panel of experts to evaluate quantitative and qualitative judgments on checklist items. The panel members reviewed the checklist in terms of content validity index (CVI), and content validity ratio (CVR). In each round, they were asked to judge the face validity of items and total checklists. In the first round, 5 items were removed from 41 items. These items had a content validity ratio (CVR) of less than 0.51 and were removed from the checklist according to the Lawshe table. Also, some of the removed items were combined with other remaining items and edited with members' comments. The remaining items were judged by members for the second round to determine the CVI. In this round, 2 items with CVI less than 0.70 were removed. The 2 items with a score ranging from 0.79 to 0.70 were moderated and reviewed by the experts. In the third round, one item with CVI below 0.70 was removed. Finally, the checklist with 31 items remained (Table 2).

Reliability

Internal consistency methods with Cronbach's alpha were used to determine the reliability of the checklist. The sample of the study to determine the reliability of the checklist was 15 people affected by earthquake. Cronbach's alpha coefficient of the checklist was 0.97. In terms of the dimensions under study, in terms of reproductive health, child health, and environmental health, Cronbach's alpha was 0.96, 0.97, and 0.98, respectively.

The results of the study showed that out of 100 households surveyed, 29 had lost at least one family member. The overall population size of the household was 427 people. Of those, 46 were reported dead and 113 injured. Among the dead 25 were females and 21 males. Also, the results of the study show that only 39% of earthquake-affected households have training about reproductive health, 55% about children's health, and 63% about Environmental health. Furthermore, reproductive health services were the lowest frequency score among three dimensions (Table 3). In the dimension of reproductive health, the most trained items were breastfeeding and contraceptive methods. Also, the most frequency services in reproductive health were contraceptives and nutrition supplements. In the dimension of child health, the most trained item was child care and breastfeeding. Also, the most frequency item in terms of child health services was the prevention/treatment of malnutrition. In the environmental health dimension, the most trained item was collecting, storage and use of water, and personal hygiene. In addition, the most frequency item in terms of providing services in the environmental health dimension was control and sanitation of water, and help build sanitary toilets.

Table 1. The checklist of health system function assessment in the Kermanshah Earthquake

Number of household members: *Urban / rural Residence:*
Number of deaths in the household: *Number of people affected in the household:*
Age and gender of the deceased: *Age and gender of the affected people:*
Damage to home: Yes *No* *Injury/ damage to Work: Yes* *No*

No.	Question	Response			
		Yes	No	Null	More
1	Have you received the necessary training in reproductive health?				
2	If yes, what training has been offered to you? - <i>Pregnancy</i> - <i>Breastfeeding</i> - <i>Safe delivery</i> - <i>Prevention of sexually transmitted infections and diseases</i> - <i>Deal with sexual violence</i> - <i>Contraception</i>				
3	If yes, at what time after the earthquake did you receive training?				
4	Did you receive reproductive health services after the earthquake?				
5	If yes, what services or care did you receive? - <i>Vaccination</i> - <i>Nutrition Supplements</i> - <i>Contraceptives</i> - <i>Diagnosis and treatment of sexually transmitted diseases</i> - <i>Pregnancy</i> - <i>Delivery</i>				
6	At what time after the earthquake did you receive services(cares)?				
7	Have the services you need been exist and available?				

Reproductive Health

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	8	Have you paid any cash for the required services?				
	9	If yes, to which part did you pay this fee? - <i>Private</i> - <i>Governmental</i>				
	10	Have you received reproductive health care regularly since the earthquake?				
	11	Have your reproductive health status been evaluated and monitored since the earthquake?				
	12	Have you received the necessary training in child care under 6?				
	13	If yes, what training has been offered to you? - <i>Child health care</i> - <i>Breastfeeding</i> - <i>Prevention of infection</i> - <i>Mental health</i> - <i>Preventing events and unintentional incidents</i>				
	14	Have your child / children received health care?				
	15	If yes, what services or care has been received? - <i>Vaccination</i> - <i>Psychological counseling</i> - <i>Prevention/treatment of malnutrition</i> - <i>Treatment of Wound/ injury due to Earthquake</i> - <i>Treatment/prevention of infectious and communicable diseases</i>				
	16	Have the services you need been exist and available?				
	17	Have you paid any cash for the required services?				
Children Health	18	If yes, to which part did you pay this fee? - <i>Private</i> - <i>Governmental</i>				
	19	Have there been regular health care for children since the earthquake?				
	20	Has your child / children's health status been evaluated and				

		monitored since the earthquake?				
WCCPRD9875565 2019/891008 Environmental Health	21	Have you received the necessary training in environmental health?				
	22	<p>If yes, what training have you been given?</p> <ul style="list-style-type: none"> - <i>Use of chlorine and other disinfectants (water disinfectant)</i> - <i>Collecting, storage and use of water</i> - <i>Sanitary waste disposal</i> - <i>Vectors control</i> - <i>Personal hygiene</i> - <i>Faeces disposal at the designated location</i> - <i>Health Food</i> 				
	23	If yes, at what time after the earthquake did you receive training?				
	24	Did you receive environmental health services after the earthquake?				
	25	<p>If yes, what services or care did you receive?</p> <ul style="list-style-type: none"> - <i>vector Control</i> - <i>Control and sanitation of water</i> - <i>Help build sanitary toilets</i> - <i>Assist in the collection and disposal of sanitary waste</i> - <i>Help to properly bury the bodies</i> - <i>Health Food</i> 				
	26	At what times after the earthquake did you receive services?				
	27	Have the services you need been exist and available?				
	28	Have you paid any cash for the required services?				
	29	<p>If yes, to which part did you pay this fee?</p> <ul style="list-style-type: none"> - <i>Private</i> - <i>Governmental</i> 				
	30	Have environmental health services been provided regularly since the earthquake?				
	31	Has the health status of your environment been evaluated and monitored since the earthquake?				

Table 2. Values of CVR and CVI of items in the checklist.

Reproductive Health	No.	Items	CVR	CVI	
	1		Have you received the necessary training in reproductive health?	1	1
	2	If yes, what training has been offered to you? - <i>Pregnancy</i> - <i>Breastfeeding</i> - <i>Safe delivery</i> - <i>Prevention of sexually transmitted infections and diseases</i> - <i>Deal with sexual violence</i> - <i>Contraception</i>		1	1
	3		If yes, at what time after the earthquake did you receive training?	1	1
	4		Did you receive reproductive health services after the earthquake?	1	1
	5	If yes, what services or care did you receive? - <i>Vaccination</i> - <i>Nutrition Supplements</i> - <i>Contraceptives</i> - <i>Diagnosis and treatment of sexually transmitted diseases</i> - <i>Pregnancy</i> - <i>Delivery</i>		1	1
	6		At what time after the earthquake did you receive services(cares)?	1	1
	7		Have the services you need been exist and available?	1	1
	8		Have you paid any cash for the required services?	1	1
	9	If yes, to which part did you pay this fee? - <i>Private</i> - <i>Governmental</i>		1	1
	10		Have you received reproductive health care regularly since the earthquake?	1	1
11		Have your reproductive health status been evaluated and monitored since the earthquake?	1	1	

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Children Health	12	Have you received the necessary training in child care under 6?	1	1
	13	If yes, what training has been offered to you? <ul style="list-style-type: none"> - <i>Child care</i> - <i>Breastfeeding</i> - <i>Prevention of infection</i> - <i>Mental health</i> - <i>Preventing events and unintentional incidents</i> 	1	1
	14	Have your child / children received health care?	1	1
	15	If yes, what services or care has been received? <ul style="list-style-type: none"> - <i>Vaccination</i> - <i>Psychological counseling</i> - <i>Prevention/treatment of malnutrition</i> - <i>Treatment of Wound/ injury due to Earthquake</i> - <i>Treatment/prevention of infectious and communicable diseases</i> 	1	1
	16	Have the services you need been exist and available?	1	1
	17	Have you paid any cash for the required services?	1	1
	18	If yes, to which part did you pay this fee? <ul style="list-style-type: none"> - <i>Private</i> - <i>Governmental</i> 	1	1
	19	Have there been regular health care for children since the earthquake?	1	1
	20	Has your child / children's health status been evaluated and monitored since the earthquake?	1	1
	Environmental Health	21	Have you received the necessary training in environmental health?	1
22		If yes, what training have you been given? <ul style="list-style-type: none"> - <i>Use of chlorine and other disinfectants (water disinfectant)</i> - <i>Collecting, storage and use of water</i> - <i>Sanitary waste disposal</i> - <i>Vectors control</i> - <i>Personal hygiene</i> - <i>Faeces disposal at the designated location</i> - <i>Health Food</i> 	1	1

23	If yes, at what time after the earthquake did you receive training?	1	1
24	Did you receive environmental health services after the earthquake?	1	1
25	If yes, what services or care did you receive? - <i>Residual spraying and vector control</i> - <i>Control and sanitation of water</i> - <i>Help build sanitary toilets</i> - <i>Assist in the collecting and disposal of sanitary waste</i> - <i>Help to properly bury the bodies</i> - <i>Health Food</i>	1	1
26	At what times after the earthquake did you receive services?	1	1
27	Have the services you need been exist and available?	1	1
28	Have you paid any cash for the required services?	1	1
29	If yes, to which part did you pay this fee? - <i>Private</i> - <i>Governmental</i>	1	1
30	Have environmental health services been provided regularly since the earthquake?	1	1
31	Has the health status of your environment been evaluated and monitored since the earthquake?	1	1
Total		1	1

Table 3. Internal consistency of three dimensions and total checklist

<i>Dimension</i>	<i>Reproductive Health</i>	<i>Children Health</i>	<i>Environmental Health</i>	<i>Total</i>
<i>Cronbach's alpha</i>	0.96	0.97	0.98	0.97

Phase 2 : Assessment of Health System Functions

Stage 1 : Secondary data

- **Children's health**

First day	
Function	
Coordination for providing 80000 cans of powdered milk as well as 2560 diaper packs for affected regions	
Strenghts	Successful collaboration with supplying organizations
Weakness	-Bureaucratic and unnecessary process for communication -Shortage place for storing the goods and materials -Lack of transportation system for transmission

Third day	
Function	
-Establishment of 2 infant screening centers in the affected regions ² -Coordination for providing special powdered milk for Phenylketonuria (PKU) patients living in the affected regions ¹	
Strenghts	Successful collaboration with supplying organizations
Weakness	-

² Sar-e-pole Zahab and Salas Babajani

Fourth day	
Function	
<p>-Providing and delivering 10 powdered milk cans for Phenylketonuria (PKU) patients</p> <p>-Distribution of 33500 biscuit pack as well as 9448 diaper packs for children</p>	
Strenghts	Successful intra-sectoral collaboration
Weakness	-

Seventh day	
Function	
-Assessment of malnutrition condition for a number of 620 children under 5	
Strenghts	Effective use of limited resources
Weakness	Lack of nutritionists in the affected regions

Three weeks later	
Function	
<p>-Facilitating the for transmission of milk and supplemental food prepared by Nestle Company</p> <p>-Distribution of 6500 packs of special supplemental food for children under 2 prepared by NGOs and charities</p> <p>-Desiging and preparing 2 guidlines for monitoring the growth of children under 5 in the affected regions</p>	
Strenghts	<p>-Successful coordination</p> <p>-On-time distributions of packages from province to cities</p> <p>-Providing needed supplements</p>
Weakness	Lack of a suitable storage place and refrigerators for keeping food materials

3 months to 1 year after earthquake	
Function	
A 100% coverage of providing health services for children under 5	
Strengths	Effective functions of healthcare providers
Weakness	Lack of documentation on providing insufficient psychosocial services for affected children

• **Reproductive health**

First day	
Function	
<p>1-Providing delivery units and health centers with midwifery staff for 7 affected cities from the earthquake</p> <p>2- Establishment of a tent and shelter for maternity and midwifery services</p> <p>3-Writing down 5 job descriptions for family health staff in crisis and emergencies</p> <p>4-coordinating receiving 6400 sanitary napkins and sending them to the affected areas</p>	
Strengths	<ul style="list-style-type: none"> -Delivering desirable services to the high- risk target groups -Timely identification of affected individuals - proper Delivering and timely services to the public -Coordination and collaboration with other related organizations -On time supporting of vulnerable groups
Weakness	<ul style="list-style-type: none"> -Providing a place for the staff's nightstands -Unexperienced volunteer staff in order to work in emergency circumstances such as earthquake -Tent and shelter deficiency in the city of Dlahoo - Sustainable service delivery to the target groups and safe childbirth - Unnecessary correspondence - Lack of storage space and vehicle for sending the required items

Second day	
Function	
<p>-Phone follow-up of 1250 pregnant women and children under 5 years old based on list extracted from SIB (web-based health registry system)</p> <p>- Organizing the day care, referral and transferring pregnant women and children</p> <p>-providing midwives for the 7 Health Centers of affected cities</p> <p>-setting up 3 shelters and delivering maternal and childbirth services in Salas-e-Babajani</p> <p>-Provide maternal and children mortality's data from the earthquake</p> <p>-provide facilities for transferring pregnant women who were hospitalized or habitant of the affected areas between Kermanshah(capital city) and their habitats in collaboration with Social Deputy</p>	
Strengths	<ul style="list-style-type: none"> -Identification damaged individuals -Delivering services to the target group - Encourage the affected population -preventing from mortality and adverse consequences - Delivering desirable services to the high- risk target groups -Timely identification of affected individuals - Proper supervised transferring of pregnant women
Weakness	<ul style="list-style-type: none"> - need to providing a place for the stuff's nightstands - Unexperienced volunteer stuff in order to work in emergency circumstances such as earthquake -Identification, referral and transferring pregnant women and children -Tent and shelter deficiency in the city of Dlahoo - Lack of access to the whole population -investigating mortality in target groups

Third day	
Function	
<p>-Target groups' Active follow-up in the cities and rural areas and service delivery to the 1500 individuals</p> <p>-Coordination with 5 hospitals to be informed of the target group's statues and determine liaisons for each hospital</p> <p>-field visit on hospitals and supervise maternal and child protocols</p>	
Strengths	<ul style="list-style-type: none"> -Identification of affected target groups -service continuity -following up target groups -receiving feedbacks about service delivery out of the hospitals - Appropriate cooperation with the provincial midwifery office to provide standardized services
Weakness	<ul style="list-style-type: none"> - work difficulties in crisis time -lack of vehicles for patient transferring -lack of proper registry in the early days of the crisis

Fourth day	
Functions	
<p>-Target groups' Active follow-up in the cities and rural areas and service delivery to the 2100 individuals</p> <p>-distributing contraceptives and complement drugs and foods including 2876 tablets.1320 box of condom,40 injections,840 nutrition complement, 1824 Iron and multivitamins tablets,10256 boxes of sanitary napkins</p> <p>-investigating con</p> <p>- Check the status of 16 pairs of thalassemia carriers</p> <p>- To send 12 expert teams of 4 experts to the regions</p>	
Strengths	<ul style="list-style-type: none"> -Identification of affected target groups -service continuity -Coordination and collaboration with other related organizations -Support of vulnerable groups -supervision of service delivery qualifications and organizing group plans

Weakness	<ul style="list-style-type: none"> - Unnecessary correspondence - Lack of storage space and vehicle for sending the required items - work difficulties in crisis time -lack of vehicles for patient transferring

Fifth day	
Functions	
<ul style="list-style-type: none"> - Preparation of 5 checklists for monitoring and supervision of service delivery units - Providing public education including 5 radio programs and 10 banner boards -Preparing the list of high-risk pregnant women in the city and villages in collaboration with the health sector to introduce gynecologists to Kermanshah 	
Strengths	<ul style="list-style-type: none"> -feasibility of standard evaluation of services in the time of disaster -raising public awareness and information -proper coordination and collaboration between health deputies
Weakness	<ul style="list-style-type: none"> -lack of enough experience to preparing checklists in disaster time -Inaccessibility of affected people to the media

Sixth day	
Functions	
<ul style="list-style-type: none"> -Coordination of setting up delivering maternal and childbirth facilities in Salas-e-Babajani - Deploys 4 experts to other affected districts 	
Strengths	<ul style="list-style-type: none"> -Continuation of required service delivery -Reinforcement related departments in capital city to be prepared for disaster and help affected cities
Weakness	<ul style="list-style-type: none"> -lack of coordination between medical universities to send required equipment - Lack of storage space and vehicle for sending the required items - Providing a place for the staff's nightstands

Seventh day	
Functions	
Coordination with Barkat Foundation to use their family health equipment In the rural areas of Ezgale -Identify 350 pregnant women in need of nutritional support	
Strengths	<ul style="list-style-type: none"> -Service delivery to the affected people -preventing unnecessary commuting between cities - reinforcement coordination and collaboration with the Red Crescent Organization in providing and distributing nutritional items for affected people
Weakness	<ul style="list-style-type: none"> - Lack of specialist sinologist - reinforcement coordination and collaboration with the Red Crescent Organization in providing and distributing nutritional items for affected people -Shortage of nutrition expert in the affected areas

Three weeks later	
Function	
<ul style="list-style-type: none"> -Coordination for setting up a shelters and delivering maternal and childbirth services in Salas-e-Babajani - Coordination with General Manager of Population Health Office of Ministry of Health and University of Tehran to Purchase and Send Contraceptives and complementary Food -Distributing storage Family Health Items related program accordance with the percentage of the affected population - Distribution of 940 food baskets for pregnant and lactating mothers in six affected cities 	
Strengths	<ul style="list-style-type: none"> -Providing required delivery services - Support of vulnerable groups - Timely delivery and distribution of baskets from province to the affected cities
Weakness	<ul style="list-style-type: none"> - The problem of coordination between universities in sending equipment - Unnecessary correspondence -Underestimate and overestimate real needs of the target groups Lack of vehicle for distributing the required items

	<ul style="list-style-type: none"> - Lack of warehouses and cold storage in cities affected by earthquakes to maintain proper food storage until distribution - Lack of facilities at the affected cities for timely distribution of food delivered
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Two Months later	
Functions	
Supply 600 shelters and 5 tents for temporary accommodation for pregnant women, babies, children under 5 and elderly	
Strengths	Desirable cooperation and support of Non-Governmental Organizations and other institutions
Weakness	The problem of building and transporting shelters from production sites to earthquake zones

From Three month to One year after the Earthquake	
Functions	
-Provide service to family health target groups in earthquake-stricken areas including 100% coverage of pregnant women, 51% coverage of middle age	
Strengths	continuous working and attempts of health workers
Weakness	-

- **Environmental health**

First day	
Function	
1-dispatching 15 pair of environmental health groups to the earthquake stricken areas, performing the factors of environmental health, and investigating the area as soon as possible (100%) 2-taking reports of control and supervising actions from 9 quake-stricken counties (100%)	
Strengths	-Preparedness of crisis groups -Suitable coordination both in internal and external parts -Being notified of biological situation
Weakness	-Inadequate number of teams regarding the enormity of the event -Lack of some equipment-problems in communicating lines

Second day	
Function	
1-Examining the health of drinking water with 300 chlorine testing cases, 30 sampling cases and 50 cases in turbidimetry (100%)-examining the availability of the WC with 140 visits (80%)-examining the burial of dead bodies-with 120 supervising cases (90%) 2- Monitoring food distribution with done and finished visits (100%) 3- Distributing 10000 vaccinates and 250 number of transporting influenza environments and 500 number of transporting Enteric environments-100 transporting Measles and Pertussis environments and 50 snake and Scorpio serums(100%)-support from the locals and other in-place forces in order to protecting syndromic diseases more and calling for help forces from definite provinces(50%)	
Strength	-Controlling diseases transmittable by water -Providing availability to WC -Hygienic burial of bodies and preventing some diseases -Preventing the distribution of not suitable food commodities -Supervising and monitoring food depots and warehouses -Educating and notifying -On time action so as to replacing the equipment and having depots for Arbaeen Event

	-Presence of the help forces for Arbaeen rituals
Weakness	-Lack of coordination in external parts and inadequate equipment -Distribution of food by irresponsible organs -Lack of having justified help forces to response the required needs.

Third day	
Function	
1-supervising the distribution of the drinking water from 60 mobile tankers(100%)	
Strength	-Providing certificate for controlling the distributed water and verification of its health -Presence of other medical universities as helpers
Weakness	-

Fourth day	
Functions	
1-waste management with 120 inspection(100%)-distributing 500 trash bags(100%)-creating two campaigns(100%)	
Strength	Preventing carrier increase and transmitted diseases and clean of the environment
Weakness	Lack of coordination in external parts with related offices

Fifth day	
Functions	
1-Controlling carriers by spraying 5000 m ² (100%) 2- Performing 1000 routine vaccination-following 20 vaccination cases in animal bites-gathering the daily reports diseases sampling of 300 cases suspicious of influenza	
Strength	-Preventing carrier development and increase -Honest collaboration and motive and interest from volunteers
Weakness	Inadequate expert forces for doing the job

Sixth day	
Function	
1-Disinfecting 3000 m ² of the areas (100%)	
Strength	Controlling infection and skin, bowel and parasitic diseases
Weakness	Lack of availability to suitable disinfectors

Seventh day	
Function	
1-Management of the infectious wastes in 30 centers	
Strength	-Preventing in infectious waste increase -Protecting the health of the staff and personnel
Weakness	Impairment of trash effacement device in Sare-pol Zahab

Three weeks later	
Function	
1-Control and inspection of 674 water resources-36020 chlorine testing cases and 350 sampling of drinking water-control and fight against carriers with 20000 m ² spraying and rodent fighting-3730 inspection and control of preparation and distribution food centers-controlling and monitoring 25168 kg food commodities	
Strength	-Covering the 100% water resources -Controlling rages and rebellions due to the water and food -Controlling leishmaniosis and other diseases related to carriers
Weakness	-Lack of physical protection of water resources -Delay in sending some samples-prioritizing the chemical fight to physical fight and recovering the environment -An increase in visit numbers -Following the legal steps in obliterating the food

Two months later	
Function	
<p>1-Control and inspection of 1348 water resources-9724 chlorine testing cases and 350 sampling of drinking water-control and fight against carriers with 53000 m² spraying and rodent fighting-7345 inspection and control of preparation and distribution food centers-controlling and monitoring 100672 kg food commodities</p> <p>2-Educating 150 number of personnel in order to mounting syndromic discipline, rages and diseases transmitted through water, food, and Pediculosis</p>	
Strength	<ul style="list-style-type: none"> -Covering the 100% water resources -Controlling rages and rebellions due to the water and food -Controlling leishmaniosis and other diseases related to carriers -Promoting the awareness of the health personnel in sending reports of contagious diseases
Weakness	<ul style="list-style-type: none"> -Lack of physical protection of water resources -Delay in sending some samples -Prioritizing the chemical fight to physical fight and recovering the environment -An increase in visit numbers-following the legal steps in obliterating the food

From Three month to One year after the Earthquake	
Function	
<p>1-Control and inspection of 5416 water resources-39923 chlorine testing cases and 2052 sampling of drinking water-control and fight against carriers with 16789918 m² spraying and 7300 hectares rodent fighting-11000000 m² fog spraying(55 village centers and 3 town centers) and 9300 number of anti-insect sprays and distribution of 4500 mosquito-net soaked with Deltamethrin-29378 inspection and control of preparation and distribution food centers-controlling and monitoring 201344 kg food commodities</p> <p>2-Preparation and distribution of 23 cholera and botulism anti serums (100%)-launching Leishmaniosis rehabilitation center in 4 counties (sarpol, Gilane gharb, Ghasre shirin, and Islam Abade gharb) (90 %)-performing spraying programs of 7926742 m² and 1054574 m² rodent fighting to control Leishmaniosis (90%)</p>	
Strength	-Covering the 100% water resources

	<ul style="list-style-type: none"> -Controlling rages and rebellions due to the water and food -Controlling leishmaniosis and other diseases related to carriers -Denial in any cholera occurrence or botulism in the area -Availability of treatment actions against Leishmaniosis for the patients -Good cooperation of the local authorities, collaboration of scientific professors in diseases management center and Tehran and Isfahan universities
Weakness	<ul style="list-style-type: none"> -Lack of physical protection of water resources -Delay in sending some samples -Prioritizing the chemical fight to physical fight and recovering the environment -An increase in visit numbers-following the legal steps in obliterating the food

Stage 2 : Primary data

Secondary data covered the functions of health system from the first day to one year after the earthquake. Filling the data gap from one year to second year after the earthquake, the field based survey were conducted in the affected regions of Kermanshah using the valid and reliable assessment tool developed in the phase 2 (Table 4). As it has been shown in table 5, the health system functions in the different aspects of reproductive health, children's health and environmental health continued by 2 years after the earthquake. However, the frequency and variety of services was decreased during the recent year and required more attention. For example, the coverage of almost all reproductive, environmental and children health services were between **90 to 100** percent since the first day to one year after the earthquake. However, the frequency of providing health services was between **30 to 60** percent since one year after the earthquake (Table 5). While, affected people have required health services to prevent diseases and public health problems post-disaster. In addition, all services were delivered free of charge in the affected regions and lack of delivered health services monitoring or evaluation was extracted from the data.

Table 4. Demographic information of households participated in the field survey

Variables		Frequency (N)	Frequency (%)
<i>Number of household members</i>		427	(100%)
<i>Deaths</i>	<i>Male</i>	21	(45.6%)
	<i>Female</i>	25	(54.4%)
<i>Injured</i>	<i>Male</i>	62	(54.8%)
	<i>Female</i>	51	(45.2%)
<i>Household Residency</i>	<i>Urban</i>	67	(67%)
	<i>Rural</i>	33	(33%)
<i>Damage to home</i>		92	(92%)
<i>Injury/ Damage to work</i>		68	(68%)

Table 5. Status of health system functions since one year after the earthquake

Function	Frequency (%)
<i>Reproductive Health Training</i>	(39%)
<i>Reproductive Health Services</i>	(41%)
<i>Children Health Training</i>	(55%)
<i>Children Health Care and Services</i>	(45%)
<i>Environmental Health Training</i>	(63%)
<i>Environmental Health Services</i>	(60%)

- **Assessment of Trauma Kit**

In addition to Iran's Ministry of Health measures, World Health Organization has airlifted trauma kits to the Islamic Republic of Iran to support the treatment of thousands people

injured as a result of the Kermanshah earthquake. The supplies were transported from WHO's emergency logistical center in Dubai to Kermanshah province in western Islamic Republic of Iran on 16 November at 10.30am local time.

We have seriously tried to figure out how the kits were applied for saving people lives and if the kits cover all urgent medical situation. We could not find any information on this subject though. According to the assessment of research team, trauma kits were delivered to Iran's pre-hospital system and distributed in the affected regions. The lack of information exist on this matter.

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A Number of Fields Pictures



