Developing a household survey tool for health equity: A practical guide in Islamic Republic of Iran

Maryam Beheshtian[1], Ardeshir Khosravi*[2], Alireza Olyaeemanesh[3]
Hossein Malekafzali[4], Shirin Bonakdar Esfahani[5], Leila Hosseiny Ghavamabad[6]
Saeideh Aghamohammadi[7], Mahnaz Nouri[8], Elaheh Kazemi[9]
Mohammadreza Zakeri[10], Fatemeh Sagha[11]

Abstract

Background: An obvious gradient in health outcomes has been implicated in many evidences relating to social and economic factors. Proper data are requested to convince policy-makers calling for intersectoral action for health. Recently, I.R. of Iran has come up with 52 health equity indicators to monitor health equity through the country. Conducting regular surveys on 14 out of 52 national health equity indicators is needed to provide a basis for the health inequality analysis through the country. We aimed to introduce a survey tool and its related protocols on health equity indicators.

Methods: This study was conducted through addressing the literature and expertise of health and demographic surveys at the national and international levels. Also, we conducted technical and consultative committee meetings, a final consensus workshop and a pilot study to finalize the survey tool.

Results: We defined the study design, sampling method, reliable questionnaires and instructions, data collection and supervision procedure. We also defined the data analysis protocol on health equity indicators, generated from non-routine data.

Conclusion: A valid and reliable tool, which could be employed at the national and sub-national levels, was designed to measure health equity in Iran. Policy-makers can use this survey tool to generate useful information and evidence to design appropriate required intervention and reduce health inequality across the country.

Keywords: Health Equity, Health Status Indicator, Health Survey, Iran.

Cite this article as: Beheshtian M, Khosravi A, Olyaeemanesh A, Malekafzali H, Bonakdar Esfahani Sh, Hosseiny Ghavamabad L, Aghamohammadi S, Nouri M, Kazemi E, Zakeri M, Sagha F. Developing a household survey tool for health equity: a practical guide in Islamic Republic of Iran. *Med J Islam Repub Iran* 2015 (5 December). Vol. 29:305.

Introduction

It is believed that those factors that influence health the most (working life, income and education) which lead to health inequalities are outside the direct reach of the health system (1-3). It is obligatory for the health sector to go beyond the traditional roles targeting social factors (4). Although the debate about intersectoral action for health is not a new paradigm in public

---

[1]. MD, MPH, Genetics Research Center, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran. beheshtianm@yahoo.com
[2]. (**Corresponding author**), PhD, Deputy for Public Health, Ministry of Health and Medical Education and Noncommunicable Diseases Research Center, Tehran University of Medical Sciences, Tehran, Iran. ardeshir.khosravi@gmail.com
[3]. MD, PhD, Office for Health Technology Assessment, Health Standards and Tarrifs, Ministry of Health and Medical Education, Tehran, Iran. olyaee@gmail.com
[4]. MD, PhD, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran. malek179@gmail.com
[5]. MD, Zoonosis Control Department, Center for Communicable Diseases, Tehran, Iran. shboesfahani@yahoo.com
[6]. MS, Office of Health Technology Assessment, Health Standards and Tariffs, Tehran, Iran. leila200565@yahoo.com
[7]. MS, Center for Health Network Management, Tehran, Iran. m.saeide90@yahoo.com
[8]. BS, Center for Health Network Management, Tehran, Iran. nouri_shetab@yahoo.com
[9]. MS, Center for Health Network Management, Tehran, Iran. elaheh_kazemi@yahoo.com
[10]. MD, Department of Health Care Management, School of Management and Medical Informatics, Shiraz University of Medical Sciences, Shiraz, Iran. mrzakeriir@yahoo.com
[11]. BS, Office of Health Technology Assessment, Health Standards and Tariffs, Tehran, Iran. fatemeh_sagha@yahoo.com

health, the involvement of other sectors beside the health sector in the formulation of health policies has been recently emphasized by World Health Organization (WHO), Commission on Social Determinants of Health (CSDH), and many other international organizations and conferences (4). It is believed that proper data are demanded to convince the policy-makers of different sectors, including education and housing, for intersectoral action on health. Moreover, defining health inequalities result in proper health interventions. By means of overall average data, differences between groups and subgroups may be masked, and disaggregated data can help track progress towards achieving health inequity reduction (5-7).

To observe health transition through time, a health equity monitoring system is required to display improvement, worsening or remaining the same situation in the health status of the community. Identification of relevant health indicators, gathering data on the indicators, analyzing the data, reporting the results and defining relevant policies, programs and actions have been recognized as five general steps for the monitoring cycle in the health sector (8, 9). On the other hand, there is a need to include health inequity monitoring as a specific field in the health monitoring system. Measuring health inequality serves as the metric, assessing health inequity. It helps the policy makers, health managers and practitioners to formulate strategies and actions to reduce health inequities (1,9,10). To assess inequalities in health, equity disaggregators are also requested and should be related to both the population and health indicators. Economic status, education level, place of residence, ethnicity and gender are commonly considered as equity disaggregators. Analyzing health indicators based on equity disaggregators is not a simple task and should be done using systematic methods. Linked data on health indicators and equity disaggregators are demanded to analyze health inequities. The most reliable and commonly used data source for the health inequity monitoring is household surveys, particularly in low and middle-income countries (8,11,12). Although countries around the world are at different stages of developing health equity monitoring system, this method is still in its infancy.

Health Equity Monitoring System in the I.R. of Iran

Since the 1979 revolution, the Islamic Republic of Iran has made many attempts to reduce inequity and deprivation in different domains including health. Providing Primary Health care to all people based on the constitutional law, I.R. of Iran's vision for 2020 (13) and the five-year socio-economic and cultural development plans (14) are some examples to display the efforts of the Iranian government to reduce inequalities. In the recent years, the Iranian Ministry of Health and Medical Education (MoH & ME) has developed the Health Equity Monitoring System to help formulate evidence based actions and plans (15), mostly based on the experience obtained from the urban HEART project in Iran in 2008 (16,17). The Health Equity Monitoring System in Iran includes 52 indicators in different domains such as health, environment and infrastructure, economic development, social and human development which had been approved by the cabinet of ministers in 2011. Indicators, their variables as inequity disaggregators and means of data collection were finalized by working groups comprising experts outside and inside the Health system using the Consensus-Oriented Decision-Making (COMD) method (15). In this system, working groups identified 38 of 52 indicators collected from the Iranian Routine Information Systems, and the data of the rest of the indicators were gathered through conducting a survey. Table 1 indicates all the 14 health equity indicators generating from the survey (Table 1). This study aimed to introduce a survey tool on the above mentioned indicators, including the study design, sampling method, reliable questionnaires and

Table 1. List of 14 health equity indicators generating from survey according to their inequality disaggregators

No	Indicator	Inequality disaggregators
1	Prevalence rate of Osteoporosis in women 45-65 years old	Age, economic level, education, geographic areas*
2	Incidence rate of mild mental health disorder	Age, sex, economic level, education, geographic areas*
3	Incidence rate of severe mental health disorder	Age ,sex, economic level, education, geographic areas*
4	Access to public health services	Age, economic level, education, geographic areas*
5	Access to specialized health services	Age, economic level, education, geographic areas*
6	Utilization of Health Services	Age, economic level, education, geographic areas*
7	Percentage of households with access to sanitary toilet facility inside the house	Geographic areas*
8	Percentage of households served by sewerage and municipal solid waste management system	Geographic areas*
9	Prevalence of overweight / obesity among 15-64 years old population	Age group, sex, economic level, education, geographic areas*
10	Proportion of people doing physical activities (based on definition)	Age, sex, economic level, geographic areas*
11	Prevalence of tobacco smoking at least once per day in population above 13	Age, sex, education level, economic level, geographic areas*
12	Proportion of people with Absolute poverty	Age, sex, education level of headed household, geographic areas*
13	Proportion of people with severe poverty	Age, sex, education level of headed household, geographic areas*
14	Household health expenditure as % of total non-food expenditure	Age, sex, education level of headed household, geographic areas*

*Geographic areas includes district, rural, urban, in marginalized area

their instructions, data collection and supervision procedure, and a data analysis protocol. Data from this survey indicate avoidable inequalities which can be targeted by relevant actions to decline health inequities in the country.

Methods
Establishment of the Health Equity Monitoring System Technical Committee
A technical committee including technical specialists from the Secretariat of Social Determinants of Health, specialized groups from the Deputy for Public Health, and other relevant sectors and academicians were formed to develop a survey tool. They were nominated based on their field of knowledge and expertise. Finally, epidemiologists, statisticians, medical doctors and sociologists were brought together to conduct several responsibilities in the committee from the study design to protocol development.

Development of the Survey Tool
The tool for the survey included the name and the exact definition of the indicators, the method by which indicators' data was obtained, calculated and analyzed by combing the inequality disaggregators. Moreover, this tool contains the study design, sampling method, reliable questionnaires and their instructions, data collection and supervision procedure and a data analysis protocol. The survey's tool coverage is national and the units of assessment cover the province, district, region and country.

The online databases for each indicator including the National Health Information System, Google Scholar, WHO, PubMed, Medline, and Scopus were sought to find and determine the definitions and measuring methods. By studying the literature review, we obtained relevant documents at the national and international levels such as DHS (Demographic and Health Survey) (18), MICS (Multiple Indicator Cluster Survey) (19), STEPS (The WHO Stepwise Approach to Surveillance), the Iranian Health Services Utilization, Iranian Household Expenditures Survey, and IrMIDHS (Iran's Multiple Indicator Demographic and

Health Survey) to develop a survey tool (20,21). In addition, experience and knowledge at sub-national levels were obtained by uploading questionnaires and protocols.

Survey Questionnaires Properties

Six questionnaires for 14 indicators and equality disaggregators in four areas of health, physical environment and infrastructure, human and social development and economic development were mainly developed based on DHS questionnaires, which were then reviewed by the experts.

Household Questionnaire is mainly based on routine questionnaires which are usually administered by Census (22), and other national and international surveys such as MICS, and IrMIDHS; therefore, its validity and reliability have already been accepted (21). The questionnaires on mental health, physical activity and obesity and osteoporosis were mainly adopted from other globally used tools: Kessler (23); STEPS (20); and Osteoporosis (Ministry of Health & Medical Education, Comprehensive Plan on Osteoporosis Prevention, Diagnosis and Treatment in Iran. 2010. Unpublished work). Utilization from health services was mainly adopted from utilizing health services in Iran (24). In addition, to ensure the construct validity of our survey instrument, we calculated the content validity ratio (CVR). On average, our questionnaires were valid with CVR of 0.8. Moreover, we determined internal consistency reliability of each questionnaire ranging from 0.73 to 0.94, using Cronbach's Alpha. Furthermore, to obtain data with proper quality, instruction was developed for each questionnaire.

In May 2013, four consultative meetings were held among relevant sections of MoH & ME (professors, faculty members, national groups and offices) that were in charge of generating indicators to discuss the content and instruction of the questionnaires in detail. Based on the results, the draft of the questionnaires was prepared and revised by the feedbacks from the pilot

study. Therefore, we assessed the face validity of the tool via comments from the households participating in the pilot study, and content validity was mainly assessed through the review of the pertinent questionnaires and comments from the experts of relevant departments in the health sector.

Finally, relevant questionnaires that were used validly, reliably and repeatedly to measure these indicators were provided. In July 2013, we consulted the key persons in the country to finalize the questionnaires, instructions and execute and analyze the protocols.

For the consistency of the data in the survey with the data form the routine system, we made certain that all of the questionnaires contained a unique identifier which links the data from the survey to the data from the socio-economic data of Iran, Census 2011. This provided us with the opportunity to analyze health data disaggregated by socio-economic factors, using a reliable method. Hence, the socio-economic data in this survey were mainly based on the variables which have been defined by Statistical Center of Iran (SCI) through Census, and Iranian Household Expenditures Surveys. Moreover, all the data on health inequity disaggregators in this survey were verified based on the data from socio-economic dataset in Iran, Census 2011. Components of the questionnaires are demonstrated Table 2.

Survey Design

The design of the survey was a cross-sectional multi-stage stratified with random cluster. Data were collected through face-to-face household interviews.

Sample Design

Two- stage cluster- sampling was used in the pilot study. Since the last census was carried out in Iran in 2011, we used the census information as the sampling frame. Selecting the sample and preparing the sampling data were both based on census information. Since we sought to have equally reliable estimates for each district,

we used the following formula (25) to estimate a target indicator (e.g., prevalence of tobacco smoking at least once per day in the population older than 13) with r = 14% and relative margin of error at 95% confidence (e) = 10% **r** and proportion of target/base population in the total population (pb) = 78% , design effect (deff)= 1.2, average household size (Ave Size)= 4 and response rate (RR)= 95%; about 900 households (n) were required in each district.

$$n = \frac{4\, r(1-r) \times \text{deff}}{e^2 \times \text{pb} \times \text{AveSize} \times \text{RR}}$$

An executive protocol was prepared to conduct the survey at the district level. To ensure cost effectiveness and high quality data, we randomly selected five clusters in the pilot study, consisting of 20 households in each cluster. Using geographical maps, households were randomly identified to be included in the survey. Using a standard sample finding method in the survey, the investigators started sample finding from the right hand side of the first household in each cluster, using a random number. To ensure random selection, no substitution was permitted.

To assess the feasibility of the survey's tool, a pilot study was conducted in October 2013 on a random sample of 100 households from Islamshahr District based on census 2011 as a sampling frame. Based on the logistic considerations, we selected 100 households for the pilot study. Considering the information from SCI, 5 clusters were randomly selected (3 clusters from the urban areas and 2 from the rural). The address and map of each cluster were provided for the study and 20 households were interviewed in each cluster.

Survey Instruments

To monitor the Body Mass Index (BMI) of adults aged 15-65, the pilot study team was provided with standard height boards and scales. The recommended height board and scale were available in the national

STEPS supply storage of the Risk Factor Surveillance Unit in the Center for Non-communicable Diseases Control of MoH & ME.

Survey Administration Method

Surveyors introduced the survey to the households emphasizing the privacy of the data taken from the questionnaires. The questions in the household questionnaire were asked from the head of the family. The spouse or another adult member of the family might have been asked to answer the questions in case the head of the household was absent. The individual questionnaires were asked from the eligible members of the household. Obtaining informed consent was found to be necessary to start the interview.

Survey Supervision

Survey supervision was established at three main levels to guarantee the proper implementation of the survey. To ensure proper field work, all questionnaires were reviewed by field supervisors at the district level. At the province level, we developed a supervision checklist to observe all relevant activities within the province including quality of sampling and data collection. National supervisors were responsible for observing the whole process of the survey based on the defined checklist on three different parts including National Coordination, Time Schedule, Data Collection and Budget Allocation. In October 2013, the national coordination team proposed the FAQ system to address any problems or questions during the survey.

Interviewers completed all questionnaires carefully under the supervision of the field supervisors, which resulted in not missing any data.

Data Analysis Procedure

A technical group was also established from the Statistics and Health Information and Technology Office and Secretariat of Social Determinants of Health to set the process of data collection and analysis. In

the pilot study, after data collection, four meetings were organized to discuss the quality of data collection and method of analysis among the technical group members. In these meetings, each question was reviewed to determine how it could be used in the analysis to calculate the indicators. We also organized consultative meetings with the relevant organization responsible for the indicators. Finally, in December 2013, we proposed a guide for data quality control and analysis protocols including syntax and a template for data presentation.

For protocol analysis, we divided sections among the involved individuals including the expert personnel from relevant offices, departments and sectors, technical persons from SCI and members of the technical committee. Experts in various fields consulted one another and reviewed the tables. Importing the data to the results depends on checking and verifying the data through the national and provincial technical committees. As a template for data analysis, we proposed tables. Variables on socioeconomic status can be placed into fewer categories if necessary i.e., wealth quintiles – richest to the poorest. In addition, we
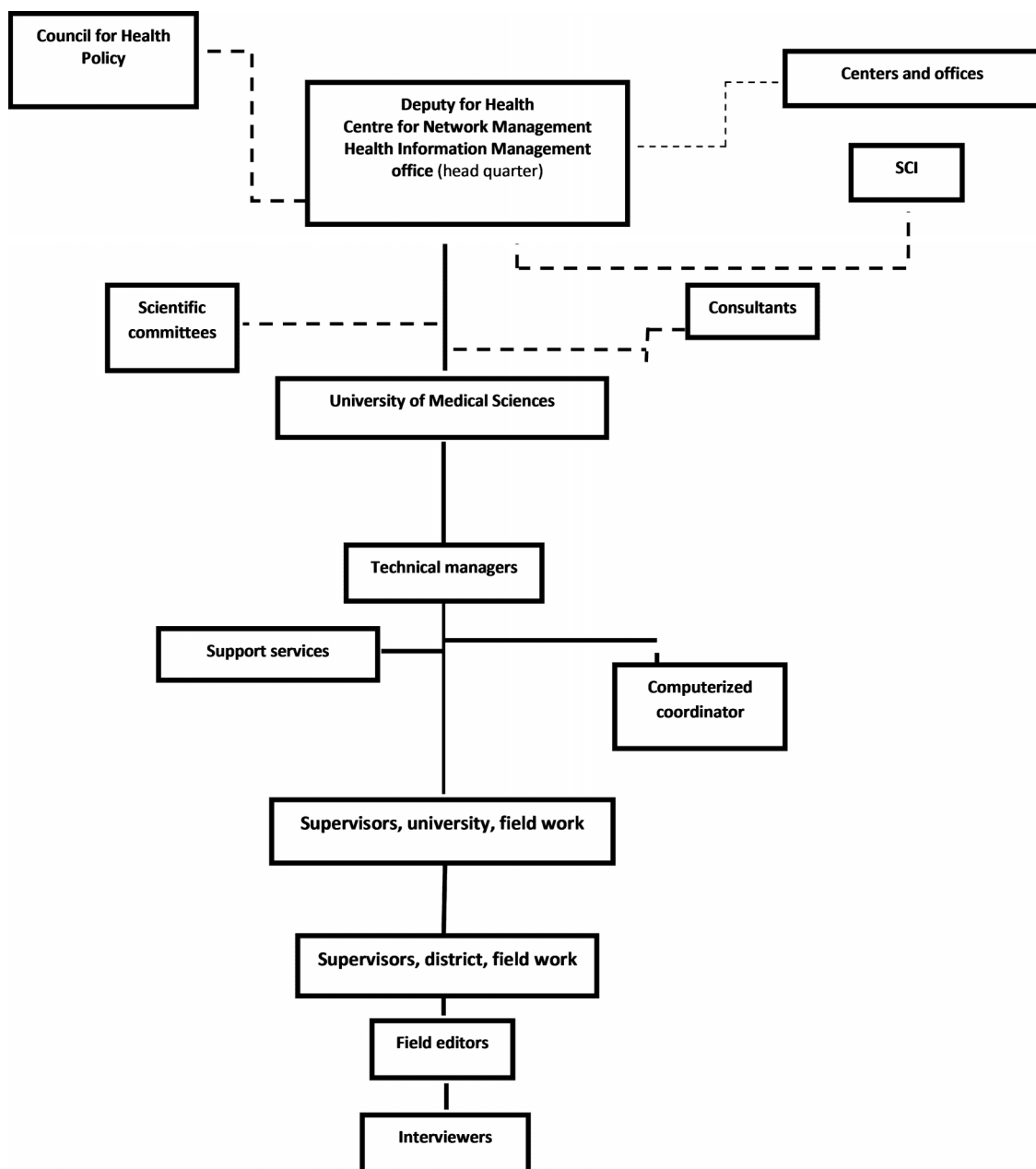

Fig. 1. Survey data flow

proposed a template for categorizing some of the inequality disaggregators (Supplementary Tables 1 and 2).

Data Entry and Processing

We designed a customized data entry program and data analysis. This program was mainly based on the experience from IrMIDHS survey and other relevant surveys in the country. This program was designed in Infopath software in Farsi (26). To ensure validity and reliability, outputs into SPSS were done and data analysis method in SPSS v.18 was discussed by the relevant department in MoH & ME. Moreover, we designed the flow of data at the national and district level. We also suggested the Centre for Health Network Management, Health Statistics Group, located at the MoH & ME, as the head-quarter of the survey. Data would be locally collected from the districts and centrally supervised at three levels: Districts, provinces, and the National Health Information Centre based on the supervision protocol. Data flow is summarized in Figure 1. In November 2013, we also developed an executive and data quality control protocols based on experiences from other national surveys such as Ir-MIDHS.

Results

In this study, we developed all the processes of a survey including the study design, sampling method, reliable questionnaires, instructions, data collection and supervision procedure, and a data analysis protocol on health equity indicators; we also piloted them, whose results are as follows:

Pilot Study

We piloted our survey's tool in Islamshahre district, Tehran province in October 2013. A survey team including the technical manager, provincial supervisor, field/ university supervisor, team supervisor and interviewers was formed. In advance, all the team members took part in a one-day training workshop. The pilot study lasted for sixteen days. One hundred households were randomly selected based on the census 2011 as the sampling frame to test the questionnaires.

Training the Pilot Study Team

All members of the pilot study teams took part in a one-day training workshop on September 28th, 2013. The training which was provided to the team members covered the following topics: Sample finding, family's communication, non-response cases management, proper understanding of the defined variables, asking questions based on the questionnaire instructions and taking measurements, conducting surveys, reports and supervision. We also discussed the interviewer characteristics and interview principals. Moreover, discussion on questions and probable problems about the questions were organized at the end of the workshop. For proper data on anthropometry, we also offered the team members with practices in the training session.

Revision based on the Feedback from the Pilot Study

Based on the feedbacks from the pilot study, we identified some problems, including case finding, due to the rapid changes in the city structure which caused some difficulties in finding the households' addresses which were indicated in the cluster list from SCI. In addition, considering the six types of questionnaires, with too many questions in total, and ambiguousness in two sections including smoking and mental health, we felt the need to revise these two questionnaires.

Finally, in December 2013, to gain valuable feedback, we consulted the experts from the relevant office of MoH & ME to revise all the questionnaires, instructions and protocols.

Brief Overview of the Pilot Study

Eighty-nine out of 100 households were included in the pilot study; eight households were absent and three rejected the interview. Tables 3 and 4 display the ex-

Table 2. Components of the questionnaires

No.	Questionnaire name	Information
1	Household questionnaire	− Household information panel − List of Household Members − Education − Occupation − Insurance − Household Expenditures and Income − Urban sanitation − Interviewer observation
2	Individual questionnaire on mental health (15-65 years old)	− Individual information panel − Mental health status including feeling nervous, hopeless, agitation, depression, worthless, need for care by specialist, and community workers (Behvarz) − Interviewer observation
3	Individual questionnaire on physical activity and overweight (15-65 years old)	− Individual information panel − Information on physical activity at work, traffic, recreation and rest − Information on BMI such as weight, height, waist size − Interviewer observation
4	Individual questionnaire on women osteoporosis (45-65 years old)	− Individual information panel − Information on fractures − Interviewer observation
5	Individual questionnaire on smoking (above 13 years old)	− Individual information panel − Information on present and previous smoking; cigarettes and water pipes − Interviewer observation
6	Individual questionnaire on health-care utilization	− Individual information panel − Outpatient (ambulant) care utilization − Inpatient (hospitalized) care utilization − Interviewer observation

amples of the results.

Seven-hundred sixty one households from the urban areas vs. 168 from the rural areas (Table 4) were interviewed. We analyzed the data from the pilot study based on the analysis model presented in the supplementary data (Tables 1 and 2).

Our pilot study included 164 (51%) male and 157 (49%) female participants. The education status of the investigated population was mainly at the high school level

(34%). In our pilot study, 10.1% of the participants were illiterate. Nearly 39% of our investigated population were employed or reported income without working. The basic insurance coverage in our study was determined around 81%. Of our investigated households, 47.2% reported the last month household expenditure ranging from 5.000.000 (178 USD) to 10.000.000 (356 USD) Rials. Notably, the reported income of 56.2% of the households was between

Table 3. Rural and urban clusters information in the pilot study

Cluster type	households Interviewed	Absent household	Number of individuals in each cluster	Household size	Number of questionnaire in each cluster
Rural*	18	2	58	3.2	168
Urban**	71	6	265	3.7	761
Total	89	8	323	3.6	929

*Rural area includes Shatareh
**Urban areas include Golshahr, Navab, Mosala and Vavan

Table 4. Questionnaires information in the pilot study

No.	Type of questionnaire	Total number	Rural	Urban
1	Household questionnaire	89	18	71
2	Individual questionnaire on osteoporosis among women (45-65 years old)	29	8	21
3	Individual questionnaire on smoking (above 13 years old)	256	47	209
4	Individual questionnaire on health care utilization	69	13	56
5	Individual questionnaire on physical activity and overweight (15-65 years old)	243	41	202
6	Individual questionnaire on mental health (15-65 years old)	243	41	202
Total		929	168	761

5.000.000 (178 USD) and 10.000.000 (356 USD) Rials.

Discussion

An emergent need for a system to monitor equity in health is illustrated by many documents. Measurement and evidence network is one of the networks among the nine networks, and it highlights the necessity of health equity monitoring system for the countries (10). Moreover, evidences all emphasized the intersectoral collaboration on conducting and interpreting the data to reduce health gap (3,27). Therefore, nowadays, the importance of partnership effort to achieve social data to tackle inequalities in health is evident. With rigorous information, it is plausible to implement the financial resources to enhance intersectoral collaboration and ensure the improvement of social, economic and environmental determinants of health (28). Developing health monitoring system is targeted by many countries around the globe. There is a rigorous routine health data system in many countries, but developing a monitoring system on equity in health is still behind the lag because of the scant data on social determinants of health (10). To address health disparities, high resolution disaggregated data are required, but the quality and availability of routine health data are often far from their optimum.

The manner in which health monitoring system should be developed to successfully respond to the new demands to reduce health gap has been emphasized by Povall and et al. in a project report on Health Equity Impact Assessment (29). There are also suggestions about the importance of seeking support from political leaders and having financial commitment for monitoring and evaluating health equity (16).

Recently, the results obtained from Urban Health Equity Assessment and Response Tool (Urban HEART) for equity evaluation introduced by Kube Center of WHO which was also applied in Iran by Tehran Municipality sheds some light on how to develop a practical and useful survey (17). Moreover,

the Iranian government responds to this need by developing 52 health equity indicators approved by the cabinet in 2011. Thus, MoH & ME is urged to design and develop a national dataset for health equity and generate data from the routine or other systems such as survey in collaboration with responsible organizations. Centralized credit budget line of MoH & ME has been allocated for the needed fund. Moreover, generating health equity data, mostly every year, are obliged to watch the trend in the country (15).

To overcome the challenges on obtaining data, we presented the method used to develop a survey tool for 14 out of 52 indicators for Health Equity Monitoring System, generated from non-routine data. To our knowledge, this paper is the first published paper that describes a comprehensive survey tool on health equity indicators in a low or middle-income country.

We aimed to design a tool with a step-by-step practical guide measuring various aspects of health equity and lowering the cost of data collection and analysis through a non-routine system.

This survey tool was developed through an extensive collaboration with experts and policy makers in the health sector.

We have also tackled with some limitations to design a high quality survey tool. In this study, most of the information was collected based on self-report (e.g., household income) that may suggest some concerns about the income data from the household questionnaire. Considering the proper link between households' assets data generating by SCI and our data, we aimed to obtain more precise measures of economic status on the largest possible proportion of the respondents. However, the underreporting or over reporting problem might still be present, but it is impossible to know how broad this problem is (30). Moreover, a research project has been conducted to generate asset index for all households based on the information from Censuses and survey by SCI. Furthermore, SCI assessed the reliability of the data to

evaluate the wealth index quintiles.

Hence, the data from the survey will be linked to the socio-economic data from SCI, and then it could not be a major concern anymore. In addition, we mostly set our survey tool within the existing capacity of health information system in MoH & ME and socio-economic dataset from SCI, as the experiences from the conducting Urban HEART in Iran showed an efficiency of utilizing from existing potential (17).

The evidence highlighted the importance of using data taken from this survey tool through the policy-making process. We developed our survey tool with the collaboration of other relevant sectors from and outside of the ministry of health to encourage them to apply results from the survey in their future policy making and action plans (16). It is assumed that this practical guide stimulates more policy makers, decision makers and researchers to formulate policy-oriented health equity actions and it also enables MoH & ME to evaluate its projects with the aim of reducing health inequities. Moreover, it may implicate the strong coordination among different MoH & ME sectors to address health inequities and to encourage them to take responsibility to resolve the problems.

In this paper, we mainly provided information on questionnaire development; a questionnaire should measure indicators with precision and should ensure that questions meet data for assessing the indicators. Our questionnaires gather relevant data to calculate relevant indicators. Ultimately, this survey tool was piloted in Islamshahr, a district in Tehran province, to understand opportunities and challenges and particular technical issues in the field of practice. The results from the pilot study in Islamshahr revealed that some pitfalls arise from our tool, particularly those related to the questionnaires and executive protocols. However, overall, the questionnaire seemed understandable, valid and easy to use, particularly after revision based on the feedback from the interviewers, supervisors and other experts.

MoH & ME can use this survey tool to assess the health equity indicators with non-routine registration. The final results from the survey were used to help understand the specific needs and support and justify policies and decisions about where to invest to decrease health gap.

Compared to the other national health surveys, the health equity survey tool is the only one designed to depict gaps in health in the country; it also allows data linkage with socio-economic administrative datasets from SCI.

Conclusion

Political context in Iran seems to be a positive frame to invest in health equity survey and monitoring system at the national and sub-national levels which in turns facilitate the full participation of the stakeholders. Therefore, our tool can provide very important data to alleviate gaps in health. In addition, this survey tool can serve as a key component of strengthening health information system, and it can also generate useful information and add to the comprehensiveness of the health monitoring system. Therefore, we could have a much more complete and practical picture of the health gap by linking it to the socio-economic datasets in the country, and this will increase the evidence for the policy-makers to design appropriate interventional programs. The data from the survey to monitor health equity should be linked with other datasets including socio-economic data source from SCI to guarantee access to the robust information for the policy makers.

Considering the limited financial resources, as well as the complexity of conducting a survey in the country, integrating this survey into the other relevant local and national surveys such as the Risk Factor survey on Noncommunicable Diseases may be more cost-effective with respect to the questions, criteria and methodological issues recommended in our survey tool.

Our final recommendation is to invest in enhancing the local capacity for the local

health data analysis. This will provide the health system managers and policy makers at the local levels with a feeling of responsibility for the local health data and health gap and will eventually stimulate greater investment and intersectoral collaboration to reduce the health gap. We proposed some of the executive and technical requirements, but this could only be achieved through establishing partnership with academic institutions at the national and sub-national levels, emphasizing approaches to strengthen the health information system (31).

Acknowledgements

References

1. Kelly MP, Morgan A, Bonnefoy J, Butt J, Bergman V, Mackenbach J, et al. The social determinants of health: Developing an evidence base for political action. Final report to World Health Organization Commission on the Social Determinants of Health from Measurement and Evidence Knowledge Network 2007:10-12.

2. WHO. Social Determinants of Health. key concept. World Health Organization home page 2008 [cited 2012 Oct 22]. Available from: http://www.who.int/socialdeterminants/thecomission/finalreport/keyconcepts/en/index.html.

3. WHO. Social Determinants of Health: The Solid Facts. 2nd ed. World Health Organization. 2003 [cited 2013 Dec 11]. Available from: http://www.euro.who.int/en/what-we-publish/abstracts/social-determinants-of-health-the-solid-facts.

4. Allen M, Allen J, Hogarth S, Marmort M. Working for health equity: the role of health professionals 2013:5-16.

5. WHO. Adelaide Statement on Health in All Policies. WHO, Government of South Australia, Adelaide 2010:2-4.

6. Public Health Agency of Canada. What makes Canadians healthy or unhealthy? 2012 [cited 2013 Oct 23]. Available from: http://www.phac-aspc.gc.ca/ph-sp/determinants/determinants-eng.php#secondreport.

7. WHO. Towards a strategy for cancer control in the Eastern Mediterranean Region.World Health Organization. Regional Office for the Eastern Mediterranean 2009:16-30.

8. WHO. Handbook on health inequality monitoring: with a special focus on low- and middle-income countries. World Health Organization 2013:1-16.

9. Braveman P. Monitoring equity in health: a policy-oriented approach in low- and middle-income countries. World Health Organization 1998: 9-36.

10. Bonnefoy J, Morgan A, Kelly MP, Butt J, Bergman V, Tugwell P, et al. Constructing the evidence base on the social determinants of health: A guide. The Measurement and Evidence Knowledge Network (MEKN) of the WHO 2007: 11-44.

11. Signal L, Martin J, Cram F, Robson B. The Health Equity Assessment Tool: A user's guide. Wellington: Ministry of Health 2008:3-20.

12. Carr D, Gwatkin DR, Fragueiro D, Pande R. A guide to country-level information about equity, poverty, and health available from multi-country research programs. HNP discussion paper series. Washington, DC: World Bank. http://documents.worldbank.org/curated/en/1999/10/3061305/guide-country-level-information-equity-poverty-health-available-multi-country-research-programs. 1999.

13. Olyaee Manesh AR, Haghdoost AA, Beheshtian M, Tehrani Banihashemi A, Motlagh M. Progress towards Health Equity in I.R. of Iran through Last Three Decades. Iranian J Publ Health, 2009;38(s1):130-135. a supplementary issue on: Iran's Achievements in Health, Three Decades after the Islamic Revolution.

14. Vice-Presidency for Strategic Planning and Supervision, Iranian Fifth Five-Year Development Plan 2010. 1389.

15. Beheshtian M, Olyaee Manesh AR, Bonakdar S, Malek Afzali H, Larijani B, Hosseini L, et al. Intersectoral Collaboration to Develop Health Equity Indicators in Iran. Iranian J Publ Health, 2013;42(s1):31-35.

16. WHO. Urban HEART: Urban Health Equity Assessment and Response Tool. World Health Organization, The WHO Centre for Health Development, Kobe 2010:10-25.

17. Asadi Lari M, Vaez-Mahdavi MR, Faghihzadeh S, Montazeri A, Farshad AA, Kalantari N, et al. The application of urban health equity assessment and response tool (Urban HEART) in Tehran; concepts and framework. Medical Journal

11

of the Islamic Republic of Iran 2010;24(3):175-185.

18. Demographic and Health Survey [cited 2013 Dec 28]. Available from: http://dhsprogram.com.

19. Multiple Indicators Cluster Survey [cited 2013 Dec 15]. Available from: http://www.childinfo.org/mics4_tools.html.

20. WHO. WHO STEPS Instrument (Core and Expanded). The WHO STEPwise approach to noncommunicable disease risk factor surveillance (STEPS). World Health Organization:5-15

[cited 2013 Dec 27]. Available from: www.who.int/chp/steps.

21. Rashidian A, Karimi-Shahanjarini A, Khosravi A, Elahi E, Beheshtian M, Shakibazadeh E, et al. Iran's Multiple Indicator Demographic and Health Survey - 2010: Study Protocol. Int J Prev Med 2014;5:632-42.

22. Statistical Center of Iran, Census 2011 [cited 2013 Dec 29]. Available from: http://www.amar.org.ir/Default.aspx?tabid=1539.

23. Kessler RC, Bark PR, Colpe LJ, Epstein JF, Gfroerer JC, Hiripi E, et al. Screening for Serious Mental Illness in the General Population. Arch Gen Psychiatry 2003Feb;60(2):184-9.

24. Ministry of health and Medical Education. Utilization of Health Services in I.R Iran, Tehran, 2004.

25. Megill D, MICS Sampling, PowerPoint slides. MICS Survey Design Workshop, Organized by UNICEF MENARO and HQ, Dubai, UEA, 30 June – 6 July, 2013.

26. Microsoft InfoPath [cited 2013 Dec 27]. Available from: http://en.wikipedia.org/wiki/Microsoft_InfoPath.

27. CSDH Closing the gap in a generation: health equity through action on the social determinants of health. Final Report of the Commission on Social Determinants of Health. Geneva, World Health Organization 2008:1-30.

28. Michigan Department of Community Health, Health Disparities Reduction and Minority Health Section. Michigan Health Equity Roadmap. Lansing, MI: Michigan Department of Community Health 2010:6-32.

29. Povall S, Haigh F, Abrahams D, Scott-Samuel A. Health Equity Impact Assessment, Project Report.Liverpool Health Inequalities Research Institute. University of Liverpool 2010:1-26.

30. Rutstein SO, Johnson K. The DHS Wealth Index.DHS Comparative Reports No. 6. Calverton, Maryland: ORC Macro 2004:4-23.

31. Buttsworth M, Rao C. Prioritising data sources to strengthen health information systems in the Asia-Pacific region. School of Population Health, University of Queensland 2013:6-10.

Appendices
Supplementary information

Table 1. Data analysis table

	Age group					Sex		Economic level					Education level					District/ Rural/ Urban/ Marginalized area				
	15-24	25-34	35-44	45-54	55-64	Female	Male	Poorest	Second	Third	Fourth	Richest	Illiterate	Incomplete secondary	Complete secondary	Secondary special	Higher education	Rural	Urban	District	Province	Margin
Indicators																						

Table 2. wealth index and education categories in health equity data analysis

Wealth index quintiles		District/ Rural/ Urban/ Marginalized area				
		urban	rural	District	Province	Margin
Education	Poorest					
	Second					
	Third					
	Fourth					
	Richest					
	Illiterate					
	Incomplete secondary					
	Complete secondary					
	Secondary special					
	Higher education					