Final Project Report

Case study of evidence-informed health policy making structures in Iran's National Institute of Health Research

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Content

List of Annexes

NIHR: National institute of Health Research

RFP: Request for proposal

MOHME: Ministry of Health and Medical Education

TUMS: Tehran University of Medical Sciences

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Remaining authors declare no conflict of interest.

Research title: Case study of evidence-informed health policy making structures in Iran's National Institute of Health Research

Background:

The National Institute of Health Research (NIHR) of the Islamic Republic of Iran is an institute dedicated to health research and scientific development at national, regional and international level. In fact, the NIHR is a structure which is expected to strengthen evidence – informed policy making in the country. Given the current circumstances of today's world, this role becomes even more pronounced. Some of the reasons behind this significance are as follows:

1. Given the identified super trends affecting the health system, and the limitations and unsustainability of the resources, the need for evidence – informed decision making seems inevitable for increasing the efficacy of the health system. With the increase in entry of novel technologies into the health system, raised awareness and demand of the society for the quality and quantity of services delivered, and increased unhealthy behavior as well as limitations related to resources, all social, economic, technological, environmental and political supertrends point towards the special focus that needs to be laid on the health system's efficacy, and this cannot be accomplished without considering scientific evidence in decision makings.

2. Although countries are committed to attain UHC, there is yet a long way to go to achieve the ideal. The important point here is that many of the questions related to UHC require local answers. Countries should themselves determine the basic health services package, the structure of the health system and how its progress is measured. Therefore, research and production of scientific evidence is essential for the discovery, expansion/development, and delivery of interventions required to maintain health. Thus, in addition to utilizing internationally produced evidence, all countries must produce it themselves too(1). To this end, the 2013 WHO Report has made the following recommendations for research utilization toward bringing countries closer to UHC (1):

o   Increasing national and international investment and support of research in the field of improving UHC
o   Close collaboration between researchers and policymakers; researchers should attempt to answer questions regarding universal health coverage
o   Increasing research capacity in countries by expanding the training of locally motivated and learned researchers
o   Defining locally comprehensive research conduction codes for each country
o   Establishment of global and national networks for coordinating research efforts through collaboration and information exchange

When Ministry of Health determined the director of NIHR, he emphasized on "Health Reform" as road to achieve universal health coverage in Iran, as duty of director. As it can be seen, many of these interventions have considerable overlap with the goals of establishment of the NIHR, and the strengthening of the NIHR is in line with the attainment of UHC. The role and position of the Institute has been outlined by its statute and their rate of achievement should be examined.

Therefore, given the significance of the NIHR in strengthening EIPM, it is necessary to determine the rate of achievement of its goals mentioned in the statute and to examine its reasons. Thus, in addition to improving the performance of the NIHR, its results can be a role model for other organizations with similar roles.

The literature review will be presented in two sections, the 'National Institute of Health Research' and the 'research impact assessment'.

➢ **The National Institute of Health Research(2)**

In 1952, under an agreement signed between Tehran University and Ministry of Health, Institute of Malariology in group of Parasitology, Faculty of Medicine was established to investigate Malaria situation in the country and combat it. Then for deciding on other health priorities during the time gradually the activities developed, chair of Public Health merged with the Institute and group Health Sciences of Faculty of Medicine was established and finally Health Research Institute in 1965 established. For more detailed studies from the same Year, fixed study stations were launched in different cities.

In 2009, the National Institute for Health Research was formed in the act of changing the previous structure and began its mission in this regard. Research Council Institute combination, how to choose the president and the kind of relationship of institution with headquarters, were set to be able to notice providing the necessary scientific evidence into a response to policy makers. As one of the first steps, a five -year strategic plan developed and adopted. Institution had considerable success in implementing its responsibilities. One of the most successes was in playing its role, without bias and nationally.

Applying a transparent system to recall, adoption and implementation of research studies and Research Council(Attended by senior policy makers of the Ministry of Health and Medical Education) have a significant role in this context. The evidence is that the institute over its activities has have research contracts with researchers from more than 50 medical universities of the country.

As presented in NIHR's constitution , The 'National Institute of Health Research', herein referred to as 'Institute', is a scientific research institute that has been established with the goal of health R&D at national, regional and international level. The objectives of the Institute as presented in its statute are as follows:

1) observatory of country's health status and its relevant sciences, and monitoring of other countries in the region (in accordance with the country's 20-year Vision Document).

2) Needs assessment of research required by the Ministry of Health and Medical Education's (MOHME) units, development of recommendations with the participation of relevant administrative units, help scientifically assess the received proposals and conduct researches required by MOHME

3) Supporting the design, execution, dissemination and utilization of research results on a large scale and the researches required by the MOHME, policymakers and decision makers at national level

4) Supervising and assessment of the correct execution of research projects that are called for by the Institute and/or requested by MOHME

5) Establishment of databanks required by the health system (both in the form of raw data and reports, the presentation or dissemination of which are subject to national intellectual rights and the MOHME's interests

6) Attempting to promote collaboration between research, educational and medical centers and relevant Iranian researchers across the country

7) Scientific and research collaboration at regional and international level with health, educational and research centers and international organizations, in line with the Islamic Republic's rules and regulations

8) Deepening and propagating the culture of research, technology and innovation among national and community teachers and researchers

9) Empowering researchers through collaboration with MOHME in the projects required by them and their capacity building through holding educational courses and transfer of novel research technologies and training of specialized resources via the execution of research theses conducted by the Institute's faculty members or other individuals.

But the important point is that NIHR is not a research center, its duty is to help Ministry of Health to use evidence in policy making, it does not been evaluated as research center, the head of NIHR report directly to the minster of ministry of health and participate in the vice chancellor of ministry of health.

Evaluation of Iran's NIHR is a unique opportunity for producing evidence about intervention for improving institutional and structural capacity for evidence informed policy making:

o According to the third stream in EMRO, there is need to improve institutional capacity in ministries of health in region's countries for accelerating use of evidence in policy making, one of the most important intervention is establishing structure by "brokering duty" or as "research and development structure" in ministry of health(3).

o Expert consultation on fostering institutional and structural capacity for evidence-based health policy-making in January 2018, Recommended to WHO " supporting work in which elements of success in countries can be highlighted to allow generation and use of relevant evidence in policy development" (4). Then the evaluation of Iran's NIHR will produce very useful lessons for WHO to act according to this recommendation.

o As showed in paper " Health research institutional mapping: an Eastern Mediterranean Regional perspective ", 13.7% of research institutes in EMRO region have policy makers in their advisory board, this show that we need chose some interventions which encourage participation of policy makers in the process of producing evidence. another result of this paper was that 60% of nonacademic research centers are governmental and the result of this study will help them for improving their functions(5).

OBJECTIVES

General objective:

A case study on the modalities use for strengthening evidence-informed decision making: The in National Institute of Health Research

To evaluate the impact of evidence produced by NIHR

Lessoned learned from the experience of Iran's NIHR

Specific objectives:

1. NIHR's research impact assessment

2. Identifying the challenges faced by the NIHR in the path towards strengthening EIPM

3. To explore facilitators and barriers of success of a body (NIHR) here to support evidence informed decision making including governance of the Ministry of Health (including Participation, Transparency, accountability, Rule of Law)

5. Recognition of the best structure for achieving its goals, with witch supervision and centralized or decentralized structure (link to the ministry, being independent, etc)

6. Identifying the lessons learned by the NIHR for strengthening EIPM in the country

Methods

Study design :This is an observational study. To evaluate the Institute's performance and achievements , a mixed method study was conducted using the triangulation design: convergent model, quantitative data validation model. The study was done in two sections, a qualitative one and a quantitative one, i.e., to examine each of the objectives, qualitative and quantitative methods was applied. The qualitative section included semi-structured interviews and document analysis. The quantitative section included the survey of researchers who have had research projects in the Institute, which was done by the questionnaire.

Methods to achieve the first objective:

The first specific purpose of the study is to examine the effects of research managed by the Institute. In fact, the assumption is that research projects which are designed based on needs are more likely to be used. Given that most researches administered by the institute have been commissioned by different departments of the Ministry of Health, investigating their effects and reasons in addition to testing the assumptions mentioned, Will increase the effectiveness of the research projects managed by the institute. The other important assumption regarding the use of research results is how stakeholders are involved in the research process. Another significant factor in which the institution is expected to have active involvement is the dissemination of research results to its stakeholders. Therefore, according to the provided explanations, in this section, in addition to measuring the impact of research, three predictors of research effectiveness including need-based, active stakeholder engagement and dissemination of results are examined. The definitions and how to measure these variables are presented in Table 1.

Table 1: definition and measurement method of variables

variable	Definition	Measurement method
research impact	According to the "payback model", the impact of research would be: Knowledge advanced, capacity building, impact on decision making, health impact, social and economic impact	Questionnaire (asking principle investigators of research) In-depth interview with stakeholders
Stakeholders' engagement	Integrated collaboration of stakeholders in research (active collaboration of them in research as member of research team)	Questionnaire (asking principle investigators of research) Document analysis (RFP, proposals and final report)
Dissemination	Active or passive dissemination of research result to stakeholders	Questionnaire (asking principle investigators of research) Document analysis (fact sheet and holding meeting)

The following steps were taken to achieve this goal:

1. Preparing the list of completed research funded by NIHR, beginning from 2014 and ending by 2017 (including the title, principle investigator, beginning and completion date, being ordered by whom), there are 66 projects which has been finished in this period.

2. Determining the research stakeholders and expected outcomes by two relevant persons (one of them is a former Director of NIHR and one of them is the Deputy of NIHR) for the 62 projects.

3. Interviews with 3 specific stakeholders (research stakeholders): The interviews were meant to clarify the impact of each research (identified in step 1) on policy making and the utilization of research results –if any.

4. Preparing the electronic version of the impact questionnaire: after clicking on the questionnaire link, each principle investigator will enter his/her specific code (that s/he has received via email). Thereafter, s/he will be asked for informed consent, if s/he chooses YES, the questions will appear one by one. To identify the problems and feasibility of the electronic completion of the questionnaire, 3 persons completed it and its output was checked. Then we sent email by link of questionnaire to PIs of 66 projects. They were called 3 times as reminder. If they didn't complete the questionnaire after these reminders, we consider them as non response.

The 'research impact questionnaire' that has been designed by the research team for this very purpose and has been used in another study before as well. Generally speaking, the questionnaire has been designed on the grounds of five domains, knowledge advancement, capacity-building, impact on decision-making, impact on health, and economic impacts. Questionnaire has attached. In our previous study " An assessment of health research impact in Iran "(6) we evaluated six medical universities in Iran.

Analysis Method: we used descriptive analyses (frequency and percentage) to present the data.

Quality Control:All responses were reviewed by two members of the research team, and if there was any ambiguity about the responses, the principle investigatorwas contacted by telephone and the final decision was made. The validity of the responses to some of the questions was also compared with what the stakeholders said.

Methods to achieve the second to fifth goal:

The following questions were asked to explore the second to fifth objectives of the study:

1. To what extent are the goals, objectives, and duties of knowledge broking organizations taken into account in the Constitution of the NIHR?
2. To what extent has the NIHR adhered to the definition of its strategic plans specified in the Constitution in different periods? Why?
3. To what extent does the Constitution clarify the specification required for knowledge broker organizations, and what interventions have been made over the years since the establishment of the NIHR?
4. To what extent have the interventions undertaken (related to the Institute's knowledge brokering role) been successful?

Document analysis and in-depth semi-structured interview methods were used to answer these questions.

Document Analysis:
- ✓ Constitution, Adopted on 18/8/2008
- ✓ Strategic Plan and Performance Report of National Institute of Health Research 2009– 2014
- ✓ Strategic Plan and Performance Report of National Institute of Health Research 2015-2017
- ✓ Strategic Plan of National Institute of Health Research 2018-2020
- ✓ Research Regulations of the National Institute of Health Research of the Islamic Republic of Iran in 2209 and its appendage in 2015
- ✓ Documents in web site of NIHR

Data extraction Guide: The purpose of document review is to clarify the extent to which the goals and tasks of broker organizations and the factors that influence their performance are contained in the cited evidence. Broker organizations' criteria based on the BRIDGE study were used for this purpose(7). According to this study, which examines the status of knowledge broker organizations in EU countries, the purpose of these organizations is to serve as credible, competent and catalytic bridges between researchers and policy-makers.

The following study summarizes the tasks of knowledge broker organizations in three basic respects:

- ♣ Inform policy making using objective processes and health system information so that they could be prepared and packaged according to time and resource constraint.

- ♣ Produce, package and deliver health system information using objective processes based on existing and urgent priorities of policymakers.

- ♣ Apply and continue to improve information packaging and information providing mechanisms (based on a comprehensive understanding of the national policy environment and objective processes)

The following defines the criteria for evaluating knowledge broker organizations: how it's governed, how it's managed and staffed, how its resources are obtained and allocated, and how it collaborates.

In-depth semi-structured interviews: The purpose of semi-structured in-depth interviews is to examine the reasons for the required actions that have or have not been taken in the institute and identify their challenges. For these interviews, a questionnaire guide was prepared and interview with relevant stakeholders was carried out.

Stakeholder identification: The purposeful sampling method was used to capture a variety of opinions inside and outside of NIHR. The criteria was persons in MOHME who have or have not collaborated with NIHR, persons who have been involved in developing the idea of NIHR. About individuals working inside NIHR, all head of departments of NIHR were selected.

In-depth Semi-structured interview guide: Interview guides were prepared separately for in-house and extramural stakeholders. The purpose of the interview with stakeholders within the institution (including the heads of the institution, deputies, and the heads of various departments) was to identify interventions conducted separately for strategic purposes, examine their challenges during intervention, and examine why some of the objectives of the Statute as well as strategic goals of the Institute's plans were not fulfilled. The purpose of the interview with extramural stakeholders is to examine their experiences of working with the institute and the challenges they have realized in this collaboration. The guide of the interview with stakeholders has been attached.

Interview analysis: Interview analysis was performed as a framework analysis. Thus, prior to the analysis, study questions, semi-structured interview questions and assessment criteria of knowledge broker organizations were used to prepare some tablesand identified codes from the semi-structured evidence analysis and interviews were entered into these tables.

 Result

In quantitative part response rate was 54% (37 from 68). In qualitative part, we did in-depth semi structure interview with 12 stakeholders in 17 separate sessions. Stakeholders were directors of NIHR in different periods, general and research specific stakeholders and staff of NIHR.

With regard to the fact that the purpose of the study is to evaluate the success of the National NIHR of Health Research and its reasons (obstacles and challenges), the results of the study are expressed as the answer to the main questions of the study. In response to each question, the results of the qualitative and quantitative study are reported together. The questions are as follows:

1. To what extent are the goals, objectives, and duties of knowledge broking organizations taken into account in the Constitution of the NIHR?
2. To what extent has the NIHR adhered to the definition of its strategic plans specified in the Constitution in different periods? Why?
3. To what extent does the Constitution clarify the specification required for knowledge broker organizations, and what interventions have been made over the years since the establishment of the NIHR?
4. To what extent have the interventions undertaken (related to the Institute's knowledge brokering role) been successful?

Question 1: To what extent are the goals, objectives, and duties of knowledge broking organizations taken into account in the Constitution of the NIHR?

For this purpose, the Constitution of the founding of the NIHR was analyzed (by two members of the research team) and the results of the interviews were used. The tasks adopted by the Constitution were compared with those assigned to a broker organization (extracted from the literature review) (Table 1).Thus, it turned out that most of the ideal tasks of knowledge broker organizations are somehow reflected in the statute, but the task of "taking measures to prevent conflicts of interest between researchers and users of knowledge and building trust between them" is diminished in the statute. In addition, in those duties specified in the statute, the type of evidence that the NIHR must produce, whether initial or synthetic, is unclear. On the other hand, the three tasks mentioned in the articles of Constitution namely "Research needs assessment of the Ministry of Health departments" and "Deepening and expanding the culture of Research, Technology and Innovation in Professors and researchers of the society" have not been included in the usual duties of knowledge broker organizations.

The Constitution does not specify whether it is the task of the NIHR to conduct synthesized or preliminary studies. In the international literature on the task of broker organizations, the synthesis of evidence is at the forefront, but it has not been addressed in the Constitution and subsequently in the NIHR's strategic plans in different periods. The Constitution also does not mention how stakeholders can engage with the NIHR and how to empower policymakers.

Table 1: Comparing the tasks adopted from the Constitution of the National Institute of Health Research with Knowledge Brokering Organizations' tasks

Row	Task of the National Institute of Health Research	Knowledge Brokering Organizations' tasks
1.	Needs assessment of the research needed by the divisions of the 'Ministry of Health and Medical Education' (MOHME), development of recommendations in collaboration with relevant administrative divisions, helping in the scientific assessment of the proposals received and conducting research studies needed by the MOHME	-
2.	Observatory of the country's health status and its affiliated sciences and monitoring the other countries of the region (in accordance with the country's 20-year Vision Document)	o Facilitating the identification, accessibility, appraisal and assessment, interpretation and dissemination of results to decision-makers and users
3.	Supporting the design, implementation, dissemination, and utilization of research results at large scale and the research required by MOHME, policymakers, and national decision-makers	o Taking necessary measures to prevent conflict of interests among researchers and knowledge users and building trust between them
4.	Supervising the correct implementation of research projects that have been contracted by the Institute and or have been requested by other divisions of MOHME to be assessed	o Evidence synthesis using community and patient –related data and existent research results for decision-makers and users
5.	Creating databanks needed from the health system (both in the form of raw data and reports which are subject to intellectual property rights and should be done according to MOHME's interests)	o Examining the strengths and weaknesses of users, their knowledge and capacities to utilize evidence o Transparent policies for sharing data and information
6.	Attempting to promote collaboration among research, educational and treatment centers and Iranian researchers inside and outside the country	Connecting different scientific domains
7.	Scientific and research collaborations at regional and international level with research, educational and health centers and international organizations –within the framework of the Islamic Republic's rules and regulations	-
8.	Strengthening and expanding the culture of research, technology and innovation among the country's scholars and researchers and the society	-
9.	Empowering researchers through collaboration with research projects required by the MOHME and their capacity – building by holding educational courses, adoption and transfer of novel research technologies and training specialized human resources through the implementation of research theses –whether conducted by the Institute's faculty members or other individuals	Capacity – building of researchers and users

Question 2: To what extent has the NIHR adhered to the definition of its strategic plans specified in the Constitution in different periods?

To answer this question, the strategic functions and goals set in the strategic plans of different courses were compared with the objectives (tasks adopted by the Statute). The comparison showed that the two goals of " Research needs Assessment of the Ministry of Health " and "deepening and expanding the culture of research, technology and innovation in professors, researchers, and society" are not reflected in the statute's strategic plans of different courses. The goals related to empowering and capacity building in researchers as well as promoting national, regional and international collaboration with Iranian research, education and health centers whether at home or abroad have been eliminated in the years following the NIHR's strategic plan (in some Cases Although these functions have been removed, some interventions related to them have been performed at the NIHR). In all periods, the goals associated with surveillance, production and use of evidence have been considered.

Question 3: To what extent does the Constitution clarify the specification required for knowledge broker organizations, and what interventions have been made over the years since the establishment of the NIHR?

 Bridge study introduces some criteria for evaluating Knowledge broker Organizations (BRIDGE study criteria). In this section, according to each of the Bridge Criteria questions, first the points stated in the Constitution then the barriers to each of the criteria, and finally the steps taken at the institution to achieve the ideal criteria are explained. These criteria include four main questions, how it's **governed,** how it's **managed** and staffed, how its **resources** are obtained and allocated and how it **collaborates.**

> **How it's governed**

This general question addresses two important aspects of governing broker organizations. The first one is the role of policymakers, stakeholders, and researchers in governing the broker organization and ensuring their transparent and objective functioning, and the second one is the existence of laws and their application for independence in the production, packaging and sharing the information of the health system in a way that could control conflicts of interest.

A) **Constitution:** In this regard, the Constitution does not provide clarity on the role of stakeholders of the Ministry of Health and the type of their relations with the NIHR, only the member of NIHR's research council are identified (deputies of the Ministry of Health, the Academy of Medical Sciences and the Iranian Medical Association).Also, as health is a multidisciplinary subject, part of the health data and its determinants are collected in other ministries and agencies. Therefore, it requires the active participation of all stakeholders to address health system problems. However, there are no stakeholders outside the Ministry of Health, which is a matter of concern given the national role of the NIHR. On the other hand, although the Ministry of Health is considered to be the main stakeholder in this Statute, the NIHR's relationship with it and the level of participation have not been specified. There is no

specific statement regarding the independence of the NIHR and the control of conflicts of interest, but it has been determined that the head of the NIHR should be a faculty, nominated by the chancellor of the University of Tehran, and approved and appointed by the Minister of Health. The board of trustees of the NIHR is also the board of trustees of the University of Tehran. Moreover these two issues could potentially create a conflict of interest and undermine the institution's independence.

B) Considerations:

The NIHR is accountable to the Ministry of Health in terms of performance but is structurally affiliated to the University of Tehran. The head of the NIHR is nominated and introduced to the Health Minister by the head of Tehran University of Medical Sciences and a member of the university faculty and the staff of the NIHR affiliate to Tehran University of Medical Sciences. From the perspective of some interviewees, all this could potentially be the source of conflict of interest. From the perspective of some interviewees, if the NIHR wants to play a national role, it should be excluded from Tehran University of Medical Sciences and all the existing parallel NIHRs must be be affiliated to the entity that, in addition to supporting it, guarantees its independence. Also, its Board of Trustees should be formed in the presence of all health-related stakeholders.

In the Ministry of Health, the role of the NIHR is very much dependent on ministers and deputies. In some periods there is no belief in the NIHR and in some periods there is a great deal of expectation from it. This accountability is also influenced by the NIHR's leadership. Even in the case of health technology assessment studies conducted by the NIHR for many years, the management was removed from the NIHR by replacing relevant managers at the Ministry of Health. One of interviewee believed that Institute's existence depends on" questions and resources" that the Ministry of Health provides for the institute. Therefore, it seems that the existence of the institution can be questioned in different periods and this is in contradiction with the essence of creating the institute.

The founding board is the same board of trustees of Tehran University of Medical Sciences. There are two different opinions as to how much this leads to conflict of interests. One of the interviewees believed that the fact that the NIHR is a subsidiary of the University of Tehran and that their board of trustees are joint would not cause any particular conflict of interests or problems. On the contrary, some interviewees believed that this would create a conflict of interest, for example, until several years after the establishment of the NIHR, the head of the NIHR was not invited to the meetings of the Tehran University Board of Trustees, The board of trustees of Tehran University of Medical Sciences is not a suitable foundation for the institution due to the number of its responsibilities and cannot play a leading role for it. At one point Tehran University was not willing to cooperate with the NIHR in terms of hiring Faculty members.

Research budgets managed by the NIHR are funded by the client. According to interviewees lack of financial independence in the institution affects its operational independence.

The relation between different departments of the Ministry of Health with the NIHR is not similar, and this is strongly dependent on the type of relationship the head of the NIHR has with the managers of the Ministry of Health.During the tenure of the two Ministers of Health, a letter was signed by them requiring all departments of the Ministry of Health to manage their research questions through the NIHR But this has not happened systematically.According to one of the interviewees, one of the reasons for this is the personal interest exists in direct connection between the Ministry of Health and researchers.

The heads of the NIHR have had different approaches in different periods. Some of them have been very involved with the Ministry of Health and have sought to get a project and have it done and others believe that the Ministry of Health will come to us if it has a question. Therefore, the NIHR's management has the power to determine the limits of its authority.Furthermore the change in the functions of the NIHR (reflected in its strategic plan at different times) indicates the authority of the agency's management over the activities of the institution. Of course, this can be both a hindrance and a facilitator.

Structural Organizations: In countries that are constantly facing emergency and crisis situations, the health system must have resilience. Part of the solution to this resilience is foresight in research in which the institution can play an important role.In this regard, some interviewees believed that there should be groups within the institution consistent with health system building blocks. Another stakeholder believed that instead of the group, a program should be designed to prevent any disruption in the agility of the institution. Believers of this approach, however, insisted that no initial research should be carried out in these groups or programs.

C) Interventions made at the NIHR:

Participation of the head of the NIHR in meetings of the Board of Trustees of Tehran University of Medical Sciences

Creating an independent budget line within the management and planning organization contributed to controlling conflicts of interest due to the loss of direct communication between the policy maker and researcher.

A research council and a designated council (subcommittee of research council by limited authority) were founded at the beginning of the establishment of the NIHR. Then in the following years the designated council was eliminated (because there was virtually no connection between the two councils) and its responsibility was transferred to the research council.

Creating an Ethics Committee with stakeholders outside the Ministry of Health

➢ **How it's managed and staffed**

This general question addresses two aspects in the knowledge broker organization, namely that the head of the NIHR has the authority to assure the accountability of the organization regarding knowledge brokering duties, and that there is sufficient staff, proper combination, and capacity to perform the task of Knowledge Brokering activities.

A) **Constitution:** According to the constitution, the head of the NIHR is responsible for managing finance, administration, employment, scientific and research and other duties within the scope of the statute, other statutes and regulations, and the Board of Trustees. But there is nothing in the Constitution regarding the provision and maintenance of human resources (its criteria and processes)

B) **Considerations**:

In order to establish the NIHR, first the NIHR of Health Research (owned by Tehran University of Medical Sciences) was created that later became the National NIHR of Health Research. Therefore, the same human resources that were working at the NIHR were employed at the new organization and until several years after the establishment of the NIHR, the new staff did not formally enter the NIHR.

Personnel in the NIHR consist of two groups of faculty and non-faculty members (experts). The promotion of the faculty depends on the production of articles, which, given the type of tasks conducted in the NIHR, is neither a priority nor possible. Therefore, the motivation of faculty to work in the NIHR and carry out brokerage activities is strongly influenced by this. The promotion laws are formulated and amended by the Cultural Revolution Council. So the head of the NIHR and its board of trustees cannot change job promotion criteria.

Part of the NIHR's staff in different periods has had executive responsibilities at the Ministry of Health and Medical Sciences Universities simultaneously which can have both positive and negative effects. .The positive effect is that they can easily transfer the needs of the health system to the NIHR and turn it into a research question. The downside is that part of their useful time is spent executive duties and the amount of their useful time is reduced.

Some interviewees believed that the promotion criteria for faculty working in knowledge broker organizations should be different from the criteria for faculty members in universities and research centers and others have argued that knowledge broker organizations should not include faculty position in the NIHR, thus the need for paper production in the institution's human resources would be eliminated and brokerage activities would become their priority. Some interviewees also argued that new recruits should have the appropriate capacity to acquire brokerage skills as well as executive experience, and work experience in the field in order to familiarize them with the policy making environment. It could facilitate the institution's brokerage activities.

C) Interventions made at the NIHR:

Quantitative Development of Human Resources (Faculty and Expert)

Since the head of the NIHR does not have the authority to change the standards of the workforce promotion of the NIHR, in order to encourage the employees to perform brokerage activities, the institution is liable to pay full-time employment only when they are involved in brokerage activities.

➢ **How its resources are obtained and allocated**

In this question, there are two important points: first, whether the financial resources of the institution are sufficient and diverse, and second, whether there is an approach to prioritizing the institution's brokerage activities and accepting the requests of policy makers and stakeholders?

A) **Constitution:** The Constitution does not mention the amount of the institution's budget, but it does include diversification of financial resources (revenues derived from services of the center in accordance with legal requirements, credits approved in the State budget provided to the NIHR as assistance, assistance and gifts of individuals and legal entities, attracting international research assistance). There is no article in the Constitution on the prioritization of the NIHR's brokerage activities.

B) **Considerations:**
Ministry of Health is the source of research funding, but the limited and unstable budget of the researcher always delays the commission of research questions to the NIHR or delays payments to the executor.

C) **Interventions made at the NIHR:**
Creating an independent budget line by the management and planning organization took place several years after the establishment of the NIHR.
Although the independent budget of the NIHR is limited in funding for small and medium-sized projects, given the limited and unstable research budgets of the Ministry of Health, such a small amount provided the client in the Ministry of Health with the opportunity to finance the research it needed until it was funded by the Ministry of Health.

The allocation of an independent budget gave the NIHR more authority in funding research and surveys (since the budget that the Ministry can allocate to research is scarce and unstable, the NIHR gained the power to support the Ministry of Health departments).

➢ **How it collaborates**
This question contains three characteristics, is the institution located in an organization or a network that supports its brokerage activities? Does it collaborate with other broker organizations in brokerage activities? And has it established functional links with policy makers and stakeholders (rapid response, interactive programs and any other mechanism to enhance the institution's accountability)?

A) **Constitution:** The Constitution states that "after the approval of the Board of Trustees, the NIHR is authorized to cooperate with scientific and research NIHRs and organizations and individuals at home and abroad and the Board of Trustees may approve the membership offer in international organizations and associations and then it could be submitted it to the appropriate authority by the head of the NIHR". But nothing has been mentioned about the other features in this section.

B) **Considerations:**

The NIHR is in contact with the heads and deputies of the Ministry of Health and not with their subsidiaries, which has made it difficult for them to interact with the NIHR and project executives. On the other hand, final reports of project are sent to senior executives but they do not send reports to their subordinates (due to management change or for any other reason). Consequently the results of the projects do not reach the main stakeholders. In the case of projects managed by the NIHR or its groups, some of them have come into effect (used in health related documents), the measures that have led to this effect have been taken by the executors themselves. At the NIHR, there are two major activities for publishing research results: publishing fact sheets and holding meetings.

Parallel institutions: In recent years, some institutions and research centers have been established by various departments of the Ministry of Health with the aim of conducting research to answer the questions of the Ministry of Health as well as building capacity in human forces. Some interviewees believed that parallel institutions impeded the growth of the NIHR (by directing resources and questions to other entities), and others believed that parallel NIHRs did not interfere with the role of the NIHR, and in fact each of them fulfilled some needs of the Ministry of Health. The latter group believes that the existing parallel NIHRs are all affiliated to the Ministry of Health. If their goals and job descriptions do not overlap, they can be used as a facilitator.

There is no mechanism in the NIHR to ensure the active involvement of customers (and other stakeholders if needed) with project executives. The collaborations that have taken place were largely due to the interest of the executor or the pursuit of the client.

The NIHR's collaboration with research and brokerage centers outside the Ministry of Health has not been systematically defined.

C) **Interventions made at the NIHR:**

The research network of Policy Management and Health Economics was established by the NIHR and during the General Assembly meeting its members were elected by voting, but this network did not reach the stage of sustainable performance.

The NIHR has been interacting with different organizations and institutions at different times for different purposes for instance, the Secretariat of the Health High Council and Food Security, the Health Insurance Research Center and the Human Resources Research

Center (affiliated to the Ministry of Health) through an a Memorandum, an one of University of Medical Sciences and an Iranian research institute to produce the required fact sheets.

Exchange activities: producing fact sheets and holding meetings (their characteristics are outlined below)

Process problems not covered in the previous sections:
There is one important question, should the executors of the large study and survey protocols and their practitioners be one person or two? Each has its own advantages and disadvantages. If the executor of both is one person and if the protocol is not acceptable, the contract with the executor will be canceled and the contract will have to be made again with another person and a lot of time will be wasted. Having different executors can pose two problems: The Protocol has intellectual property and the producer is reluctant to hand it over to someone else for implementation. On the other hand, the executor of the study and survey may not accept portions of the protocol.

Peer review of research proposals and reports and the length of its process (delayed response of referees, disagreement between them and finding another referee) are one of the most important problems of the NIHR. In surveys conducted by the NIHR, the observers are members of a technical committee. This issue has partially resolved the judgment problem, but this problem persists for other projects of the NIHR and only a limited number of referees who have acceptable performance are left.

Dissemination of research report: stakeholders were unaware of project reports even when they had commissioned the research project themselves.

The website was founded in 2010. The website of the NIHR was practically a big challenge in some period, because no one was in charge of it in the NIHR, and the company that had designed it did not support it.

Fourth question: To what extent have the interventions undertaken (related to the Institute's knowledge brokering role) been successful?

The list of the interventions undertaken by the Institute regarding each of its functions has been presented in the table. It is not easy to comment on the success of the interventions. Ideally, it would be best to measure the level of impact of the Institute's activities on health policymaking, for which proxy indices may be used, such as, utilization of the Institute's activities' results in the preparation of policy documents. Another proxy index that is used in the same vein is used to examine the particulars of the activities undertaken by the Institute: do these activities and products have characteristics that raise the possibility of their utilization in policymaking? Given these descriptions, we will use three references to respond to this question:

o The questionnaire completed by the project's principle investigators (the Institute's projects that have been completed between 2014 and 2017)

o Analysis of the Institute's documents and interviews with stakeholders on the impact of the Institute's research and activities

o Examining the characteristics of the knowledge products produced and the mechanisms of knowledge exchange undertaken in the Institute

Table 2: the interventions which have been done in NIHR from its establishment

Functions of the Institute during different periods	The interventions taken
Observatory	o Preparing the 'Multi-year heath surveys plan' within the time framework and updating it 3 times o Establishment of the strategic observatory council in the Institute o Designing the Health Observatory model in the country, publishing the 'Practical Guide To Health Observatory ' book, and delivering it to all stakeholders o Establishing the technical committee for eight community – based surveys and changing the supervisory process of national surveys: given some of the difficulties that have arisen in the supervision of national projects, in addition to forming a technical committee for each survey, it was decided that their supervision begin from the start of survey, and the supervisor take over the supervision of the project with an approved proposal. This supervision must include at least the examination and approval of the study protocol, field visits and re-analysis of the project data. o The supervisor of each survey is a member of the technical committee as well. o Establishing the Health Observatory technical committee with the participation of the representatives mentioned in the bylaws o Visiting the Ministry of Energy and examining the experience of dashboarding observatory data for senior managers to design a monitoring room in the NIHR o The gradual production procedure of the dashboard (a web-based platform on which the results of surveys, research and program assessments will be displayed) o Preparing a manual for creating and expanding provincial health research stations responsible for regional observatory and independent evaluations of health o Preparing observatory reports o The UHC book in 2014 o The HTP review report in 2017 o The 'Health at a Glance' reports in 2017 and 2018 o The prevalence of narcotics use in Iranian adults – results of the Non communicable Diseases Risk Factors Survey in Iran in 2016 (Winter 2018) o The status of Iranian families' household health expenditure – the results of the Household Income And Expenditure Survey in 2016 and 2017 (Winter 2018) o Examining the quality of air and its impact on health in Iran in 2017 (Winter 2018) o Promoting efficacy in the Islamic Republic's Health System (Summer 2019) o Atlas of the No communicable Diseases Risk Factors Survey in Iran (2016) (Autumn 2019) o The status of unawareness of hypertension in Iran –based on the results of community – based surveys (Spring 2019) o The status of the fertility rate in Iran (Spring 2019) o Atlas of the main health indices of WHO's Eastern Mediterranean Regional Office (EMRO) o Basic health insurance coverage before and after implementing the Universal Insurance Program and the Health Transformation Plan (HTP) (Autumn 2019) o Assessment reports of the Islamic Republic's Health System (Comprehensive assessment of the HTP, the Islamic Republic's Health System's Assessment Report –presented by the NIHR, HTP Assessment –in collaboration with the WHO) o Support reports (Examining the District Health Information Systems (DHIS 2), reviewing the European health observatory activities and policies, reviewing the Institute of Health and Medical Evaluation's (IHME) activities, examining the

	OECD's activities in the field of health, introducing national health accounts of human resources, transparency in the health system)
	o Management and collection of health relevant data at population level
	o Implementing Iran's Multiple Indicator Demographic and Health Survey (IRMIDHS) in 2010, and the design and contracting of population – based studies including the IRMIDHS 2015
	o The design and contracting of the Optimization Study during two periods (2014 & 2015)
	o Ordering the STEPS study (2016 & 2019)
	o Conducting National Health Accounts surveys from 2009 until 2011 under the stewardship of MOHME and collaboration with the Statistics Center of Iran
	o Household Income and Expenditure Survey analysis
	o RFP and supervision of the 'Prevalence of Infertility in the Iranian Population' study
	o Contracting the Mental Health Survey to the National Addiction Center
	o Contracting the "Determining the time of development and adolescence' survey" to the TUMS Child Development Research Center
	o Preparing RFPs for 1) Global Survey of Narcotic Substance Abuse among Youth, 2) Narcotic Substance Abuse among Adults, 3) Employees' Occupational Health Survey, 4) the Health and Population Survey, 5) the Youth Risk Factors' Surveillance System (CASPIAN) and approval of its implementation in the form of a two-phase public RFP in the Institute's research council
	o Data management of the CASPIAN and Reproductive Health Survey
	o Approval of health related data reported by Iran to international organizations
	o The website display of data regarding eight surveys conducted in the country
	o Preparing a manual for researchers for sharing the data collected by the Institute. It was revised and decided that researchers' analyses and results be examined for any inconsistencies.
	o The HTP Assessment (Universal Health Coverage)
	First measure: The first HTP Assessment Report (Assessing the Health Domain)
	Second measure: Survey of meso-level managers on the implementation of the HTP
	Third measure: Holding the HTP Appraisal Conference
	Fourth measure: Presenting the HTP Assessment model in the form of Universal Health Coverage
	Fifth measure: Performing the WHO's first assessment
	Sixth measure: Drafting the report on assessment of the steps taken by Deputies for the HTP, prepared by the Institute –in technical collaboration with the WHO
	Seventh measure: Performing the second assessment of the HTP by foreign consultants
	Eighth measure: Beginning measures to establish strategic purchasing
	Ninth measure: Drafting a memorandum of understanding with the WHO to prepare the Comprehensive Health Report of the Islamic Republic of Iran
	Tenth measure: Summarizing the indices required by UHC in an international framework of UHC and the complete presentation of the indices
	Eleventh measure: The continuous drafting of study summaries, particularly based on policymakers' needs and questions
	Twelfth measure: Drafting the HTP assessment report –based on an international model (Health System Observatory Report)
Production of evidence	1. Approval of the Institute's constitution by the Board of Trustees and updating it during different periods
	2. Establishment of the Ethical Committee
	3. National RFPs for HTA projects, health system research, research projects on

	policy documents on promoting pre-hospital emergency services 4. Management of research projects, ranging from reception of proposals to expert evaluation and peer review of final reports 5. Regarding the topics that were reported by MOHME to the Institute, RFPs would be prepared by the contracting party and then calls would be made. The proposals would be reviewed by the Deputy of Research and then examined in a specific council in the Institute. Project reports would also be sent by the Institute's research deputy for supervision. 6. 'Research needs assessment' was conducted by the Institute in the form of a two research projects.

Utilization of evidence	Creating and managing the Institute's website
	1. Development of relevant guides and guidelines, including:
	Research constitution, project recommendation form, RFP regulation methods
	Ethical guides
	Project reviewers' and writers' guides
	Knowledge translation form and guide to writing the 1, 3 & 25 reports
	HTA guides (project screening format, project screening reports, HTA projects methodologies, glossary)
	2. Mandating the presentation of project reports in the form of 1, 3 & 25 reports along with the final report
	3. Mandating the publication of the project summary and results in Hakim journal
	4. Website display of the projects' 1 & 3 reports (on the Institute's website)
	5. Preparation of study summaries (90 study summaries) in the form of brochures and info graphs and their active dissemination to the Ministry's Deputies and policymakers and in meetings of university deans and their passive dissemination (upon organizations' requests)
	6. Preparation of monologues and their active delivery to policymakers and uploading them on the Institute's website (which are on a specific publication menu)
	7. Holding professional meetings with stakeholders on important health topics and/or to present the results of conducted projects
	8. Launching groups through virtual networks to transfer project results
	9. Book compilation:
	   o The National Health Accounts surveys book
	   o The HTA reports book
	   o Production of 9 books on "the Roadmap and National Health Management Plan of Disasters in Iran"
	   o The provincial constitution of holistic health management and development
	   o Final report of the 'Designing Spiritual Health Services' project
	   o The Persian translation of the HTA glossary
	   o Universal healthcare in Iran
	   o HTP Assessment in the treatment domain
	   o The four-year performance of the National Institute of Health Research
	   o HTP assessment during the first year (Spring 2015)
	   o The Islamic Republic's position among the countries of the 2025 Vision –based on the global health status of 2014
	10. Journals
	   o **The Hakim Journal:** Hakim is a scientific research journal jointly published by MOHME's Deputy of Research and Technology and the NIHR, and is published to familiarize the country's researchers and physicians with the latest achievements in medical sciences.
	   o **Health Technology Assessment (HTA) in action:** this is the first journal dedicated to health technology assessment in developing countries. IR's

	National Institute for Health Research publishes this journal under the supervision of Tehran University of Medical Sciences (TUMS). This journal is a peer-reviewed journal that aims to publish topics related to health technology assessment; it is noteworthy that HTA in action offers a fast route for publishing high-quality peer-reviewed research. The journal covers studies evaluating medical equipment, medicines, vaccines, procedures and systems developed to solve a health problem in the form of original studies, review articles, case reports, brief communications, and letters. HTA plays an important role in the process of macro and micro policy and decision making, therefore it is expected to witness an improvement in the pace, efficiency and validity of policy making via publishing HTA studies.
Scientific collaboration	1. Creating a management and policymaking research network 2. Signing a memorandum of understanding with the Deputy of Health to manage HTA projects 3. Being member of the International Association of National Public Health Institutes 4. Being member of "Health Technology Assessment International;" in some years 5. Signing a memorandum of understanding with the School of Public Health to conduct HTA studies 6. Collaboration between the Institute's research departments with research and educational centers 7. Collaborating with UNFPA and UNICEF on the implementation of the IRMIDHS study 8. Signing a memorandum of understanding with Hamedan University of Medical Sciences to prepare study summaries 9. Collaboration with WHO's regional and headquarters' offices to assess the HTP (over multiple periods) and holding educational workshop
Empowerment	✓ Holding educational courses: • Holding the economic assessment in HTA educational workshop contracted by MOHME • Holding the national workshop of 'principles of developing equity – based intersectoral health programs' for Deputies of Health of universities of medical sciences from across the country • Holding a seven-day educational course aimed at Qazvin University of Medical Sciences experts in the field of 'principles and techniques of basic work skills in an organization', project management, health policymaking, drafting policy documents, making research applicable, principles and techniques of intersectoral collaboration, community participation, social marketing and universal advocacy. • Holding the educational course of health messengers including the experts of 30 units of Qazvin province in the field of principles and techniques of intersectoral collaboration, drafting policy documents, advocacy, social marketing, sustainable development and the health sector, and the application of provincial research results • Holding the educational course of principles and techniques of social marketing in the health system for experts and managers of Deputies of Health at Shahid Sadoughi University in Yazd • Holding the educational course of principles and techniques of advocacy in the health system for MOHME's Deputies of Health experts • Holding the educational course of empowering the central emergency experts based in the Deputy of Curative Affairs to monitor and evaluate hospital

	emergency departments
	• Holding the educational workshop of principles and techniques of success of national medical scientific hubs (specifically aimed at the country's scientific hubs' plenipotentiary representatives)
• Holding the health – oriented educational workshop for programmers of radio networks (IRIB)
• Holding the educational workshop of principles and techniques of advocacy for scientific groupsand permanentmembers of Iran's Academy of Medical Sciences
• Holding the educational workshop of principles and techniques of social marketing for IRIB's health policymaking council, SWO experts, Deputies of Health of Yazd University of Medical Sciences, Health Messengers of Qazvin province
• Holding the educational workshop on evaluation of community – based programs of prevention of substance abuse for the Narcotics Control Center, the SWO, Department of Education, and the State Prisons Organization
• Holding Strategic Purchasing workshop in collaboration with World Health Organization
✓ Providing funds for some of the Institute's faculty members'theses

➢ **The questionnaire completed by the project's principle investigators**

The payback questionnaire that has been completed by the project's principle investigators consists of 5 sections, the results of each of which are henceforth described.

1. **Knowledge development:** Overall, 29 articles have been published from 18 projects (by Nov 2019); 16 Persian articles and 13 English articles. 14 articles have been published in at least either of ISI, PubMed, or Scopus databases; these articles were the fruit of only 6 projects. Overall, 8 citations have been made and the mean impact factor of the journals is 1.88.

2. **Research – driven capacity–building (at individual and organizational level):**

- Of the projects reviewed, 9 were undergraduate theses and a total of 31 students from MPH, Master's degree, general medicine, and specialization degrees have graduated (23 students for one project and at specialization level).

- In six of the 37 projects (16.2%) conducted, part of the costs have been used to strengthen the resources of the research organizations the researcher is active in.

- In seven of the 37 projects (19%), all or part of the infrastructures needed were provided by means other than the projects' own budgets.

- Of the 37 projects, 12 (32.4%) have facilitated the securing of research funds from other organizations (inside or outside the health system).

- In 14 projects, the research results have been used by other researchers to define the next research projects.

3. **Impact on decision-making:**

   Twenty (54%) projects have been used in book compilation.

Three projects (8.1%) have been utilized in developing educational content for professional groups (health policymaking and health human resources).

The results of 8 (21.6%) projects have been used in the Ministry's policymaking. These projects have mainly been utilized in the 'Noncommunicable diseases Prevention and Control Document', the 10th paragraph of the resolution passed in the 14th session held by the 'Higher Council of Health and Food Security' and 'interviews held with MOHME Deputies'.

The results of three projects have been used in policymaking outside the health system (directly and indirectly) (program evaluation and production of related indices; General Office for Road and Urban Development, Kerman Municipality)

4. **Impact on health:**

Fourteen (37.8%) of the principle investigators expected the utilization of the project results to directly affect health (such as, disease prevalence and incidence, quality of life and/or life expectancy). Only one executive was aware of the application of research results and four principle investigators reported not applying the project results.

Most principle investigators (23; 62%) expected that the application of project results would improve the status of health determinants (such as, modifiable risk factors, social determinants of health, and environmental determinants). In this group, only four were aware of the implementation of their project results, although even they did not know if it had been successful or not.

Eighty percent (30) of the principle investigators expected the utilization of project results to improve the quality of health service delivery (including, acceptability, accessibility, appropriateness, effectiveness, efficacy and safety). They claimed that only 3 projects' results had been implemented, however, they were unaware if the expected results had been achieved or not.

5. **Impact on economics:**

Ninety-five percent (95%) of researchers didn't expect that the results of the their project were not suitable for production of consumer products or services (35 principle investigators).

Thirty principle investigators (81%) believed that the results of the project could not optimize the product and/or earlier product (increasing the quality and/or reduction of production costs). The results of 4 of the 6 researchers who believed in the optimization of products had not been utilized in practice.

Four principle investigators (10%) expected the direct utilization of research results to reduce the number of days lost due to illness or disability (being admitted at home and/or the hospital). None of these four researchers' project results had been implemented.

Four principle investigators (11%) expected the utilization of research results to reduce the patients' direct costs. Half of these researchers were unaware of the implementation of their projects.

Based on the claims of 12 principle investigators (35%), the utilization of project results can reduce the health system's direct costs. In practice however, only the results of one researcher's project have been utilized. The researcher believed that the expected result had been achieved, and that the project had contributed to a 25% reduction of the health system's costs.

- ➤ **Analysis of the Institute's documents and interviews with stakeholders on the impact of the Institute's research and activities**

- Of the projects conducted by the department of social determinants of health (SDH), 14 projects have influenced the decision-makings in the Ministry of Health, the Social Welfare Organization, the National Medical Supervising Committee, Iran Drug Control Headquarters, Tehran Municipality, and the Iranian High Council of Health and Food Security.
- Examining the health news released by the media to identify the figures stated by MOHME authorities in press conferences and interviews (2016 & 2017), news related to the first 100 days of the Health Minister (from 23rd Aug 2017) was collected and classified.
- The results of one project was utilized in the production of a data sharing manual, and the results of another was utilized in the production of the Institute's information dashboard.

- ➤ **Examining the characteristics of the knowledge products and the knowledge exchange mechanisms undertaken in the Institute**

Here, the BRIDGE criteria were used(8). The results of the document analyses and interviews were then extracted and presented in tables 3 and 4.

Knowledge products: The knowledge products produced by the Institute are, annual reports (Health Profile reports), periodic reports (periodic analysis reports and trend analysis reports), support reports, and study summaries (that are based on the results of a research), and books. The particulars of these knowledge products are mentioned in table 3.

Table 3 : Descriptions related to NIHR's knowledge products

What it covers	
Does it cover a topical/relevant issue?	Yes. The study summaries' topics are usually based on up-to-date issues, and in some cases are selected and prioritized based on the policy-maker's order.
Does it address the many features of the issue based on the best available health systems information?	The Institute's knowledge products often describe the country's status quo regarding the outcomes and risk factors. The reports sent by the Institute are not enough for solving problems. The stakeholders order research projects based on the issues they face, and their results are sent back to them. However, since the health system's problems need a set of research productions leading to actionable messages, the contractor is unable to solve his/her problem simply with the results of a research. In fact, the stakeholder's expectation is to receive the solution (e.g. in the form of standards) from the Institute.

What it includes	
Does it include knowledge from synthesized, assessed health systems information and from the tacit knowledge, views and experiences of policy-makers and stakeholders?	The Institute mainly conducts primary research, as an approach of problem-solving does not exist. Thus, evidence synthesis is not on its priority list.
How it's targeted	
Does it explicitly target policy-makers and stakeholders and engage them in reviewing the product for relevance and clarity?	The study summaries have been written in the target audience's language, however, are mostly the Institute's research results. Therefore, they are not written in collaboration with the stakeholders, except for the study summaries that are written on a specific topic.
How its use is supported	
Is it supported through online commentaries or briefings that contextualize the information and through ongoing communication that brings new information to the attention of policy audiences?	No

Knowledge exchange mechanisms: Here, the BRIDGE criteria were used(9).This process takes place in the following forms in the NIHR: Holding meetings in the Institute and/or MOHME with different MOHME stakeholders and researchers to present research results and/or giving speeches on a specific topic. And, holding meetings in the Institute with members of the Institute and researchers to present the results of researches managed by the Institute. The particulars of these meetings are described in the following table.

Table 4: Examining the knowledge exchange mechanisms

What it covers	
Does it address a topical/relevant issue from the perspective of policy-makers and stakeholders?	Yes; the meetings that are held for presenting the research results and/or topics required by policymakers.
Does it cover the many features of the issue (underlying problems or objectives for action, policy and/or program options, and key implementation considerations)?	The meetings held with experts on specific topics fit these descriptions.
What it includes	
Does it incorporate the tacit knowledge, views and experiences of policy-makers and stakeholders?	The meetings held with experts on specific topics fit these descriptions.
Does it consider a body of health systems information on a defined topic?	
How it's targeted	
Does it explicitly describe policy-makers and stakeholders as key participants?	The meetings held with experts on specific topics fit these descriptions.
Is it timed to relate to a policy-making process or to requests from policy-makers?	
How it's organized	
Are optimal participants proactively identified, invited and engaged in in-person or at least real-time online interactions?	No. Individuals participate in them voluntarily.
Are key information products pre-circulated?	No
Does each participant have the potential to contribute equally to the discussion and are there explicit rules about whether and how comments can be attributed?	First item: It holds true for the meetings held with experts on specific topics. Second item: No
How its use is supported	
Are insights captured through the creation of products based on the knowledge-sharing interactions?	No
Are these insights publicly shared and brought to the attention of target audiences through e-mail alerts/list servs?	No

Discussion:

The purpose of this study was to investigate the role of the National Iranian Institute of Health Research in enhancing evidence-based policymaking and exploring its cause and drawing lessons learned from this experience. Overall, the study found that research conducted and managed by the institute could all potentially influence health-related outcomes, determinants, and quality of service. It was also determined that although active and passive publishing was done for most of the research and surveys conducted or managed by the institute, this process needs to be modified because there are still stakeholders who are unaware of the research results. Another point is that the National Institutes of Health research is not far ahead of the results' release and it has to be decided whether or not it should do so. The National Institutes of Health Research has come a long way, and lessons learned from it can pave the way for similar organizations.

The lessons learned from the study include those that have been modified over time at the institute, the challenges that the institution has faced, and the interventions that have been made to address these challenges. The lessons learned are as follow:

1. Knowledge Broker organizations provide and manage evidence, and information that play an important role in designing, implementing, and evaluating health system policies consequently conflicts of interest are highly likely. Therefore, these organizations must predict the solutions and use them from the outset. Conflicts of interest in brokerage organizations should be considered in financing the organization as well as in the broker's accountability (in what organization and in what way), and the structural dependence of the broker organization.

2. The role of stakeholders in the Ministry of Health and outside the Ministry of Health and their interaction with the institute should be clearly identified. Obviously this is closely related to the structure, performance and accountability of broker organizations. This transparency should reduce the taste-based behavior of each of the stakeholders and increase their systematic interactions.

3. The goals and objectives of the knowledge broker organization must be clearly defined. The goals and tasks of knowledge broker organizations have a wide range of duties and objectives, including:
   "Arranging and managing shared forums for policy-makers and researchers
   Creating relationships of trust
   Establishing agendas and common objectives
   Indicating shared opportunities
   Defining information needs
   Commissioning syntheses of research of high policy relevance
   Packaging research syntheses and promoting access to evidence
   Increasing ability for knowledge translation
   Communicating and sharing advice
   Observing influence on the know–do gap" (10).

Specifying the goals of a broker organization is the first step in determining the tasks of a broker organization. These include health surveillance and its determinants, producing evidence (initial or synthetic evidence) to solve the problems posed by Policymakers, active need assessment in decision-making organizations to simpler tasks such as conducting policy talks for policymakers' needs. Defining and clarifying these tasks, in addition to smoothing the way forward (such as the type of evidence produced and the actions that need to be taken after the evidence is produced), could reduce the likelihood of taste-based changes.

4. Knowledge broker organizations are expected to provide credible responses to policy makers and shorten the interval between the policy maker's request and response. They must therefore adjust their processes so that both expressed variables are obtained.

5. Quantitative and qualitative development of human resources and their management in knowledge broker organizations should be such as to empower and encourage them to carry out their brokerage activities and consider their career promotion as well.Human resources working in knowledge broker organizations need to have different types of knowledge and skills depending on the type of activity is performed in the knowledge broker organization. Different studies have been done on this issue and the skills required have been classified in different ways. In a study in Australia, 15 knowledge broking sessions between policy makers and knowledge brokers were examined. The study found that a knowledge broker in each session should perform facilitative, diagnostic, interpretative, and deliberative roles (Reference 1), thus they need to have the skills required for each. In another systematic review study, the tasks of knowledge brokers were identified as "recognize, involve, and link stakeholders, facilitate collaboration, detect and acquire relevant information, Facilitate expansion of analytic and interpretive skills, develop tailored knowledge products, Project coordination, Support communication and information exchange, Network development, maintenance, and facilitation, Facilitate and assess change, Support sustainability" [11].

6. The broker organization must identify the environment of the decision making organizations (which the broker organizations are supposed to support in their decision making). This identification should be from the perspective of the decision-making approach, the knowledge level of decision-makersand their communication processes (for example, what department or individual is the main user of evidence in the decision-making organization or if the proper users receive the evidence and the report sent to senior managers). By identifying the environment, decision-making organizations, in addition to creating effective processes, can enable decision-making organizations to employ human resources as needed.

7. One of the defining goals of any knowledge broker organization is to create interactions among different stakeholders, researchers, or policy makers in different organizations. There must be a mechanism in broker organizations to ensure active stakeholders' engagement.

8. If there are entities parallel to the broker organization, it can be used as a facilitator. Of course, in countries with limited and unstable resources, the establishment of these organizations should be prioritized and viewed with caution. But even under these circumstances, if their goals do not overlap, each of them can be part of the country's health needs.

At the end, the recommendations to organizations whose role is to provide evidence to assist policymakers are presented(12). As it can be seen, these seven recommendations overlap with what was extracted from the present study. The seven recommendations to such organizations are as follows :

"1) Work with other organizations to achieve the same objectives;
 2) establish close connection with policymakers and engage stakeholders in the work;
 3) be independent and settle conflicts of interest among those engaged in the work;
 4) develop ability among staff in the organization;
 5) apply good methods and be clear in the work;
 6) Start small, have a clear audience and scope, and address important questions;
 7) Pay attention to implementation considerations, even if implementation is not a remit"(12)

Evaluation of Iran's NIHR was unique opportunity for producing evidence about intervention for improving institutional and structural capacity for evidence informed policy making, its result is so useful for other organizations such as R&D units in other decision making organizations in Iran (such as the Higher Insurance Research Institute) and other countries. By Using the lessons learned from this assessment, they can improve their own performance and impact.

Appendix 1: Guide to interview with NIHR stakeholders outside the NIHR

1. Why NIHR has established? What is the goal of NIHR?
2. Has the NIHR been successful in achieving its goals or not? Why?
3. Have you ever collaborated with the Institute? What kind of experience do you have? Which strengths and weaknesses did you identify during this collaboration?
4. Please give the reasons if you have not collaborated with the Institute.
5. What impact has the Institute's position (in MOHME and its affiliation with Tehran University of Medical Sciences) had on its structure and performance?
6. What role has conflicts of interests played in your collaboration with the Institute and researchers?
7. To what extent has your role been specifically defined in the Institute's governance, and to what extent is it objectively and transparently practicalzed?
8. In your opinion, to what extent has the Institute acted independently in its performance?

Appendix 2: Interview Guide with National Institute of Health Research Stakeholders within the Institute

1. There are no interventions in the Intervention Strategic Plan concerning some of the purposes of establishing the institute mentioned in the Statute. What is the reason?
2. There has been no intervention regarding some of the strategic functions and objectives written in the Institute's strategic plans, what is the cause?
3. To what extent has the institution been successful in achieving its goals?
4. What challenges does the institute face in achieving its goals?
5. How much resources and freedom does the head of the institute have to spend on knowledge broking activities?
6. 6. How has the status of the institute (in the Ministry of Health affiliated to Tehran University of Medical Sciences) influenced its structure and function?
7. Where does the institute's funding come from?
8. If the National Institute itself conducts research, how will the research be funded? (Does the research user pay for the research?)
9. What does the National Institutes of Health research do to publish the results of its research and activities?
10. What steps have been taken by the Institute to clarify data and information sharing?
11. What steps are taken to prevent conflicts of interest between researchers and users of knowledge and to build trust between them?
12. How suitable is the size, composition, and capacity of the institution's staff for knowledge broking activities? How is the essential human resource provided and allocated?
13. Are the financial resources of the institute and the combination of its funding sources appropriate for knowledge brokering activities?
14. What is the status of the institute in terms of cooperation with other knowledge broker organizations?
15. What is your opinion on the structure (authorities-responsibilities-reporting) of the National Institute of Health Research? What suggestions do you have for improving it ?
16. What is your suggestion for improving the performance of the institution?

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