

National health research
system mapping in the
Eastern Mediterranean Region

A study of ten countries



**World Health
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Regional Office for the Eastern Mediterranean

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WHO Library Cataloguing in Publication Data

World Health Organization. Regional Office for the Eastern Mediterranean

A strategy for health promotion in the Eastern Mediterranean / World Health Organization. Regional Office for the Eastern Mediterranean

P.

WHO-EM/HLP/036/E

1. Health Promotion 2. Health Education 3. Regional Health Planning
4. Eastern Mediterranean I. Title II Regional Office for the Eastern Mediterranean

(NLM Classification: WA 541)

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Printed by WHO Regional Office for the Eastern Mediterranean, Cairo

Document WHO-EM/RPC/027/E/01.08/250

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Preface

The governance and management processes of national health research systems require good information, and success depends on transparent and inclusive evidence-based decision-making. Systems to produce and use research in the Eastern Mediterranean Region of the World Health Organization have been described as weak despite the presence of significant human capacity.

In a collaboration between WHO Regional Office for the Eastern Mediterranean, the Council on Health Research for Development (COHRED) and the Health Ministers' Council for Cooperation Council States, it was decided, in 2005, to address the question of how to begin strengthening the capabilities of health research systems to produce research addressing the national needs. The aim of the study was to collect relevant information to inform the process of strengthening the national health research systems in the Region. Ten countries were included in the study. The research was not meant as a one-off academic exercise, but rather as an action-oriented process.

The COHRED National Health Research Systems mapping questionnaire was used as the tool for this study. The process of data collection was based on document review and interviews with senior staff engaged in health research in the countries. The results showed that while there are examples of good practice, few participating countries have a formal national health research system and most lack the basic essential building blocks for an effective system. Four countries described formal governance structures and management structures for their national health research systems, while just two have a dedicated national health research policy, plan or strategy. Six countries have national health priorities and only three countries have set national health research priorities. One country has established a system of monitoring and evaluation for its national health research system, but no country reported systematic efforts to feed research results into decision-making within the health sector.

The study revealed the need to strengthen the national health research systems by different degrees in all the countries studied. The experience of this study has shown that a phased action-oriented approach can enable decision-makers to move quickly to system improvement initiatives.

Acknowledgements

The Collaboration would like to thank all the policy-makers, researchers and other stakeholders who provided the information collected as part of this initiative. In specific we would like to thank Dr Mohammed Abdur Rab, formerly Regional Adviser, Research Policy and Cooperation, WHO Regional Office for the Eastern Mediterranean, who initiated the discussions that led to this project.

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The collaboration also thanks the following for their in-country data collection: Dr Jamal Alsayyad, Ministry of Health, Bahrain, Dr Mai Saob, Ministry of Health, Jordan, Dr Abdullah M Al-Bedah, Ministry of Health, Saudi Arabia, Dr Abdulaziz Khalaf Abdullah Karam, Ministry of Health, Kuwait, Dr Salim Adib, St Joseph University, Lebanon, Dr Asya Al-Reyami, Ministry of Health, Oman, Dr Naser Ali Asad Al-Ansari, Hamad Medical Corporation, Qatar, Dr Nouredine Bouzouaia, Ministry of Health, Tunisia, Dr Abdullah Al-Naimi, Ministry of Health, United Arab Emirates, and Dr Tarek Salah Asaad, Ministry of Health and Population, Yemen.

1. Introduction

The growing acknowledgement of the role that research and development plays as a catalyst for socioeconomic development has led to increased demands for, and investment in, monitoring and evaluation of national research and innovation systems. Traditionally, these systems have been evaluated at the macro level using broad indicators of inputs (usually financial and human), and outputs (research papers and patents). [1]

Within the health sector, the concept of National Health Research Systems (NHRS) emerged from preparatory work conducted for the International Conference on Health Research for Development held in Bangkok in 2000. [2] This conceptual framework defined the underlying values and primary aims of NHRS, and summarized the key functions necessary for it to achieve these aims.

Health research systems are particularly complex, involving not only the health sector but also key actors and institutions that may not consider themselves part of the national system of health research, but rather part of health, science and technology or development systems, or indeed part of international or private research systems. While we speak about NHRS to help coordinate comprehensive measurement, management and improvements in “research for health”, it is clear that the NHRS is not a monolithic structure and that there is wide variety in system structures between countries.

Thus, decision-makers within a NHRS often have little direct authority over the entire range of institutions and individuals that need to act if change is to result in health system improvements, health gains and reduced health inequity. Governance and management processes in this context therefore require good information, and success depends on transparent and inclusive evidence-based decision-making. Such issues are particularly relevant to countries in the Eastern Mediterranean Region, where

systems to produce and use research have been described as weak despite the presence of significant human capacity. [3, 4]

It is against this background that the partners involved in this study approached the question of how to begin strengthening the capabilities of health research systems to produce research addressing national needs, in particular to inform health sector decision-making, improve health and reduce health inequities.

In 2002, the WHO launched an initiative to conduct 'international benchmarking' of health research systems. [5] However, this project has yet to publish a report of the findings of its country-level case studies or make its data collection instruments publicly available. The WHO Regional Office for the Eastern Mediterranean sponsored a series of country projects in 2002 and 2003 to describe the health research situation in the Region. [6] While providing much useful information on the health research systems of the countries involved, each country team developed their own approach to the assessment, thus limiting possibilities for cross-country comparison and the development of a common model of assessment and system strengthening for the Region. In addition, this assessment did not specifically examine how well the research systems in these countries could identify health inequities.

As a result the Regional Office for the Eastern Mediterranean and the Council on Health Research for Development (COHRED) decided in 2005 to conduct a new study in several countries not included in the 2002 work in order to continue the NHRS strengthening efforts in the Eastern Mediterranean Region. Subsequently, the Director-General of the Executive Board of the Health Ministers' Council for the Cooperation Council States proposed that GCC countries be included in the study.

The aim of the study was to collect relevant information to inform the process of NHRS strengthening, with a demand that this first phase of evidence collection should take a matter of months rather years so that obvious action could start in the shortest time possible. This publication is a summary of the information collected. Further details can be found in the individual country pages of

Health Research Web (www.cohred.org/HealthReserachWeb) and for the Member States of the Gulf Cooperation Council in Khoja and Hussein 2006. [7] The results of this study are also published in the *Eastern Mediterranean Health Journal*, 2008: 13(3).

2. Methods

The collaboration started with a planning meeting held in Riyadh in November 2005. A total of 10 countries from the Region participated: Bahrain, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Tunisia, United Arab Emirates, Yemen, all of which had expressed strong interest in strengthening national systems of health research (Table 1). The principal investigators from each of the 10 countries were invited to a project development workshop held in Oman in May 2006. The aim of this workshop was to involve the country investigators in defining the scope of the study, gain feedback on the problems facing the NHRS in their countries, review and adapt the approach to their decision-making needs, and jointly design the mapping questionnaire to be used.

The COHRED model of NHRS strengthening employed in this study is designed, not as a one-off academic exercise, but rather as an action-oriented process. The complementary “process” activities with NHRS decision-makers from all the stakeholder groups that may need to act on the findings of the analysis are as important as the compilation and analysis of the evidence base.

COHRED employs a model of NHRS analysis that can be phased, depending on resources available and on level of sophistication of existing systems. It is action-oriented, emphasizing concurrent data collection, analysis and interventions, rather than proscribing an “encyclopaedic” approach to data collection. The approach defines analyses at four levels:

1. Mapping: of the people, structures, institutions and policies that make up the NHRS;
2. Profiling: of the human, institutional, financial, production and utilization capacities of the system;

3. Performance assessment: of the system and its impact on health sector decision-making, health and health equity;
4. Evaluation of interventions: a long-term commitment to a cycle of evidence-based management of the NHRS informed by routine monitoring and evaluation.

The 10 national investigators decided at the workshop that a phased action-oriented approach should be taken by the initiative. The first phase, reported in this paper, comprised a “mapping” of NHRS to help decide on priorities for system strengthening.

A shortened version of the COHRED NHRS mapping questionnaire was reviewed and further adapted by participants to give the instrument used in this study (Annex 1). The questionnaire consists of a series of questions to structure and guide a description of a national health research system in four sections:

- governance and management of the national health research system
- institutions engaged in ‘research for health’
- key stakeholders involved in ‘research for health’
- available literature and data review on ‘research for health’.

The questionnaire was designed to be completed by an experienced researcher, or a junior researcher working under supervision, and was based on document review and interviews with senior staff engaged in health research in the countries. Due to the considerable variation in NHRS designs, information was collected in an open question format and the responses were subsequently coded for analysis. Data collection took place during July and August 2006.

In coding responses describing national systems two general principles were observed. First, that we were primarily interested in structures, policies or statements focused on the national research and health research systems, as opposed to those focused only on parts of the system, for example on the Ministry of Health or specific institutions. Second, that the questions were directed at formal systems, not ad hoc or occasional systems or individual examples of good practice.

The following definitions and distinctions were employed to guide question coding:

- “NHRS governance” is concerned with the framework of relationships, systems, processes and rules for making decisions within the system. It also provides the structure through which the system’s objectives are set, as well as the means of attaining and monitoring the performance of those objectives. Research management is concerned with the planning and execution of the activities required to achieve the system’s objectives.
- As there is a wide range of ways in which countries create policies to deal with research, any formal plan or strategy providing direction for the health research system of the country was accepted. Such plans could be part of broader policy documents, for example focused on health, research, science and technology or national development. In such cases these documents were classified as “health research policies” if they had significant health research content, as opposed to the simple identification of health research as a strategy with no further elaboration.
- “Values” were defined as guiding principles for the system. Stipulations to adhere to ethical principles, but with no statement of additional underlying values, were not considered as a valid value statement.
- “Aims” were identified from statements of aims, goals or objectives, or phrased as a vision or mission statement for the system.

The responses for all countries were coded by COHRED to provide consistency, the results were then circulated to the principal investigators for verification and clarification on areas of uncertainty.

To classify participating countries in terms of socioeconomic development, the human development index (HDI) was used. [8] The overall HDI can be broken down into three sub-components covering health (life expectancy), education and economic performance (GDP). The United Nations Development Programme reports data on public sector contributions to health and education as a measure of national

commitment to these sectors and a range of data on technology and knowledge creation are also provided.

To give a general impression of national academic research outputs and the proportion that relates to health research; data on published articles and reviews were extracted from the Science Citation Index, Social Science Citation Index and Arts and Humanities Citation Index, published by Thompson Scientific (formerly the International Science Institute) for each country. The Web of science ® classifies each indexed journal according to subject matter and those fully focused on health were identified using the classification developed by Paraje et al. [9, 10] An inherent limitation of this approach is that journals indexed by Thompson Scientific form only a subset of all academic research journals and that journal publications constitute just one of many outputs of national health research systems. [11]

3. Results

Country characteristics

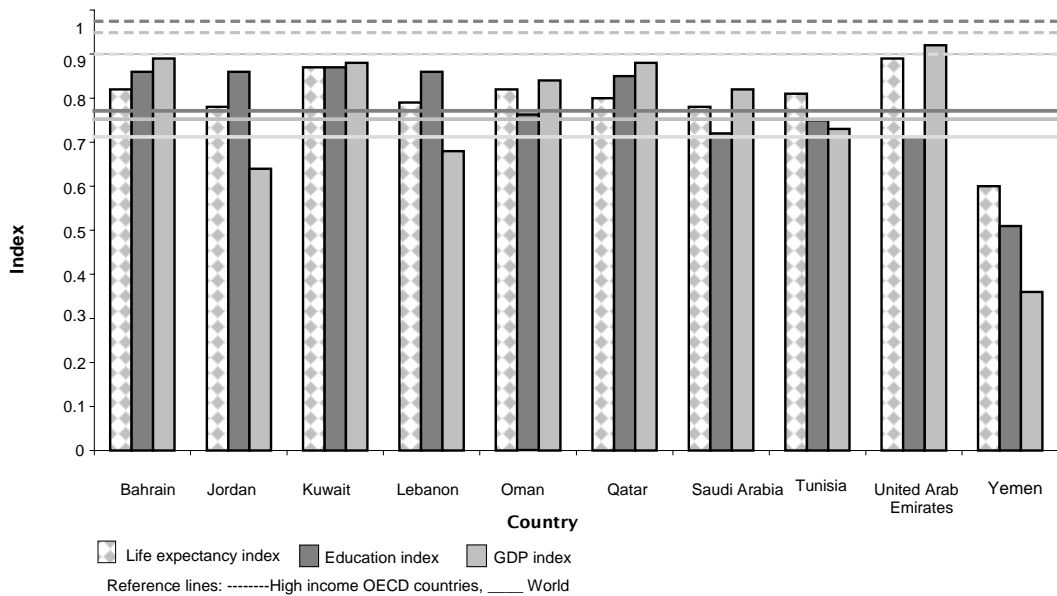
At the time of the study the 10 countries that participated in this study mainly fell within the high (Bahrain, Kuwait, Oman, Qatar and United Arab Emirates) and middle (Jordan, Lebanon, Saudi Arabia, Tunisia) rankings for human development, with HDI rankings ranging from 33 to 87 out of the 177 states ranked (Table 1). Only Yemen, ranked at 150, fell below this range and was classified as having a very low HDI.

Figure 1 shows the index scores (2004) for the sub-components of HDI. Life expectancy is broadly comparable, except in Yemen, but the differences increase for education and GDP. The graph shows the distinct differences in GDP levels between the six Member States of the GCC and the other four participating countries. For Jordan and Lebanon low levels of GDP are offset by high scores on the education index. The low HDI rank for Yemen is clearly illustrated in the graph.

Public sector commitments to health mostly fall in the range of 2.5% to 3.0% of GDP, with only Qatar and Yemen falling below this level and Jordan considerably exceeding it with a commitment of

4.2% (Table 1). There is greater variation in commitments to education, which range from 1.6% to 8.2% of GDP. There have been considerable rises in public sector commitment to education since 1991 in three countries: Kuwait (4.8% to 8.2% of GDP), Oman (3.4% to 4.6% of GDP) and Tunisia (6.0% to 8.1% of GDP). There is a lack of data on education commitments for half the countries and on commitments to technology and knowledge creation for even more.

Saudi Arabia and Tunisia produced the most academic research papers of the 10 countries in 2004. If only health-related research publications are considered, Kuwait and Lebanon join Saudi Arabia and Tunisia as the major producers of the 10 countries (Table 1).



Adapted from: United Nations Development Programme. *Human development report 2006*.

Figure 1. Human development index sub-components for 10 countries, 2004

Table 1. Country characteristics (2004)¹

	Bahrain	Jordan	Kuwait	Lebanon	Oman	Qatar	Saudi Arabia	Tunisia	United Arab Emirates	Yemen
Human development										
Human development index	0.859	0.760	0.871	0.774	0.81	0.844	0.777	0.760	0.839	0.492
HDI rank	39	86	33	78	56	46	76	87	49	150
National commitment to health and education										
Public health expenditures (% GDP)	2.8	4.2	2.7	3.0	2.7	2.0	3.0	2.5	2.5	2.2
Public education expenditures 2002–2004 (% GDP)	–	–	8.2	2.6	4.6	–	–	8.1	1.6	–
Technology and knowledge creation										
Patents granted to residents (per million people)	–	–	–	–	–	–	–	–	–	–
Receipts of royalties and licence fees (US\$ per person)	–	–	<0.0	–	–	–	<0.0	1.8	–	–
R&D expenditures 2000–2003 (% GDP)	–	–	0.2	–	–	–	–	0.6	–	–
Researchers in R&D 1990–2003 (per million people)	–	1927	69	–	–	–	–	1013	–	–
Academic research output										
Research publications indexed by the ISI (<i>n</i>)	85	568	489	412	261	109	1351	898	498	43
Health research publications indexed by the ISI (<i>n</i> , % of all research publications)	43 (51)	181 (32)	245 (50)	229 (56)	93 (36)	47 (43)	631 (47)	298 (33)	187 (38)	20 (47)

¹ Data refer to 2004 unless otherwise stated

– Data not available

NHRS governance

Four countries (Jordan, Lebanon, Oman, and Tunisia) described formal governance structures for their NHRS (Table 2). In three (Lebanon, Oman, and Tunisia) governance is located within a general research council, covering all fields of research and not just health. In Lebanon, the Board of Administrators of the National Council for Scientific Research, appointed by the Council of Ministers, carries out the governance function for the whole research system. In Tunisia this function is carried out by the Superior Council for Research, which is chaired by the Prime Minister and has as members representatives of all ministries involved in research. Jordan reported multiple formal governance structures based within different government ministries depending on the type of research or where it was conducted.

In Bahrain, the Health Research Committee, and in Saudi Arabia, Ministry of Health structures, act as proxies for national structures of health research governance. Kuwait reported structures at the institutional level only and the United Arab Emirates described an ad hoc role played by government health departments. Qatar is in the process of establishing a formal governance structure for its NHRS.

Table 2. Aspects of NHRS governance and management

Component	N	Countries
Formal NHRS governance structure (e.g. health research committee)	4	Jordan, Lebanon, Oman, Tunisia
Formal NHRS management structure (e.g. research council)	4	Jordan, Lebanon, Oman, Tunisia
National health research policy/plan/strategy	2	Oman, Tunisia
National health priorities	6	Bahrain, Oman, Qatar, Saudi Arabia, Tunisia, Yemen
National health research priorities	3	Lebanon, Oman, Yemen
Statement of values for the NHRS	2	Oman, Tunisia
Statement of aims for the NHRS	5	Jordan, Lebanon, Oman, Tunisia, Yemen
Monitoring and evaluation system for the NHRS	1	Oman

NHRS management

Lebanon (General Secretariat of the National Council for Scientific Research) and Oman (Scientific Research Council) have NHRS management structures based within their general research councils. Jordan and Tunisia have multiple structures conducting NHRS management functions within different ministries based upon the type of research conducted and the institution conducting the project. For Jordan the institutions involved include the Higher Council for Science and Technology.

Bahrain reported technical sub-committees of the Ministry of Health's Health Research Committee as a proxy for a national research management structure. As with the NHRS governance, Kuwait described institution level management structures and Qatar the efforts being made to establish a formal NHRS management mechanism. Saudi Arabia described multiple structures within its Ministry of Health and the King Abdel Aziz City for Science and Technology, but these do not constitute a formal "mechanism" covering the NHRS as a whole. In Yemen, the Department of Research and Information, within the Ministry of Public Health and Population, fulfils some of the functions related to the day-to-day management of the NHRS.

Ministry of health research 'office'

All 10 countries reported that there was some mechanism through which the Ministry of Health coordinated its role in health research in the country. For seven countries this mechanism took the form of a directorate or department of research (Table 2). Jordan and Lebanon have assigned this responsibility to their general research councils but with Ministry of Health representation on the research council's health sub-committee. The Ministry in Bahrain is in the process of establishing a position/unit to fulfil this role.

National health research policy

Two countries in the Region have a dedicated national health research policy, plan or strategy (Table 2). Oman has a research plan formally integrated within its 5 year national health plan. In Tunisia the focus of the health research plan is not to direct the type of research conducted, but rather to develop its health research capacity and research system, as an integral part of a global plan of economic and social development for the country.

In Lebanon and Qatar, the issue of a policy for health research has been identified as a priority but has yet to be realized. In Lebanon the development of the Science, Technology and Innovation Strategy has been postponed; and in Qatar, the development of the plan will be the responsibility of the health research governance and management structure being developed.

For Bahrain and Saudi Arabia, health research is included as a strategy within national health plans, without the progression to a formal health research policy. Similarly for Yemen there is health research content in the National Health Plan, the Health Sector Reform Strategy and the National Research Plan but this does not constitute a framework for a national health research policy. In Jordan health research is addressed in the National Development Plan, the National Science and Technology Plan and the National Health Plan, but the health research coverage of these documents is unclear.

In Kuwait, research strategies have been developed at the institutional level only and in the United Arab Emirates institutions are given the responsibility of deciding their own research directions.

National health priorities

Six countries have national health priorities (Table 2). The priorities identified for Oman, Qatar, Saudi Arabia, Tunisia, Yemen are given in Table 3. In Bahrain health priorities have been adopted by the Ministry of Health and included in the ministry's budget for 2007–2008. In developing its priorities, Oman conducted a number of participatory workshops as part of its health development plan.

Participants included researchers, experts, technical and administrative personnel from all levels of the ministry, regions and health institutes. These workshops reviewed the achievements of the previous national health development plan, analysed the health situation, and identified and prioritized the problems through scoring the health problems.

Table 3. National health priorities

Oman	Qatar	Saudi Arabia	Tunisia	Yemen
<ul style="list-style-type: none"> ▪ Vision 1: Delivery (providing) of the best health care to the community ▪ Vision 2: Quality assurance of health services and patient safety ▪ Vision 3: Minimizing threatening risk factors to the public health. ▪ Vision 4: Promoting woman and child health ▪ Vision 5: Propagation of healthy lifestyle in the community ▪ Vision 6: Better quality of nutrition for all ▪ Vision 7: Joint action for better community health ▪ Vision 8: Discrimination in the access to administrative practices ▪ Vision 9: A Health information and research system to meet the needs of the health system ▪ Vision 10: Sufficient and qualified human resources working in the health institutions 	<ul style="list-style-type: none"> ▪ Premature death and catastrophic injury from road trauma, workplace accidents, and infant and early childhood mortality ▪ Early onset of preventable long-term conditions, particularly those where genetic factors may make the local population more vulnerable: e.g. diabetes and certain forms of cancer ▪ Lifestyle diseases that reduce life expectancy and quality of life, such as obesity and cardiovascular disease, respiratory disease related to smoking, and stress-related mental illness 	<ul style="list-style-type: none"> ▪ Actual activation of medical services provision by all hospitals and facilities at King Fahad Medical City ▪ Completion of (Referral Tertiary Hospitals Belt) ▪ Eradication of Malaria ▪ Completion of rebuilding and renewal of 450 primary health care centres (PCCs) out of the 2000 included in The King Fahad New 2000 PCCs Initiative ▪ Implementation of health insurance ▪ Nationwide implementation of information technology in Ministry of Health, health services as part of the National Electronic Government Project 	<ul style="list-style-type: none"> ▪ Reinforcement of the reproductive health results, the family health and the demographic policy ▪ Preservation of the sanitary security capacity and reinforcement of the surveillance system and disease control ▪ Control of noncommunicable diseases ▪ Improvement of the health of high risk groups and people with particular problems ▪ Development of capacities to assure drug safety, vaccines and needs of blood transfusion ▪ Human resource promotion ▪ Control of the health budget growth and the development of the health system 	<ul style="list-style-type: none"> ▪ The fight against common and endemic diseases ▪ Combating malnutrition ▪ Reduction in high risks threatening mother and child health ▪ Strengthening curative and support services ▪ Environmental health

In Lebanon, the Ministry of Health started a process of setting national health priorities but this was postponed. In the United Arab Emirates, health priorities are dealt with at the department level within the Ministry of Health.

National health research priorities

Only three countries (Lebanon, Oman, and Yemen) have set national health research priorities (Table 4). In Lebanon, eight of the 16 priority research themes set by the National Council for Scientific Research focused on health-related topics. These priorities were set by the health sub-committee of the National Council for Scientific Research even though the country has not developed national health priorities. This contrasts with Yemen where research priorities were developed to closely match national health priorities.

Table 4. National health research priorities

Lebanon	Oman	Yemen
<ul style="list-style-type: none"> ▪ Research and development towards the exploitation of new agricultural opportunities with clear economic benefits, including animal stocks, health and nutrition ▪ Research in biotechnologies: quality and specifications of Lebanese ethnic diet and of locally produced food ▪ Research on nutritional systems and their impact on public health in Lebanon ▪ Research in basic and experimental sciences with promising societal benefits and applications ▪ Research in molecular and cellular biology and related genomic applications ▪ Research on chronic diseases prevalent in Lebanon and the region, and development of suitable treatments ▪ Research on new genetic diseases and epidemics in Lebanon and the region ▪ Research on the forecasting of natural disasters in Lebanon and the region, and mitigation approaches of economic, social and environmental impacts 	<ul style="list-style-type: none"> ▪ Malnutrition ▪ Anaemia in pregnant women ▪ Cardiovascular diseases and lifestyle risk factors ▪ AIDS ▪ Cancer ▪ Road traffic accidents ▪ Diabetes ▪ Blindness ▪ Viral hepatitis ▪ Tuberculosis ▪ Hospital management ▪ Primary health care ▪ Environmental health ▪ Health systems research 	<ul style="list-style-type: none"> ▪ Communicable and endemic disease ▪ Maternal and child health ▪ Health Systems ▪ Health-enhanced behaviour and environments ▪ Non-communicable diseases

In Oman national health research priorities were first established for the fifth 5-year national health plan 1996–2000. A scoring system method developed in collaboration with WHO was used to prioritize the research topics. Criteria scored included: relevance, avoidance of duplication, feasibility, political acceptance, application of results, urgency of data needed, and ethical acceptability. This exercise was repeated for the sixth five-year health plan 2001–2005. In the seventh health development plan 2006–2010, research priorities were directed towards the health priorities identified.

In Qatar the NHRS governance and management structures being established will have the responsibility of setting national priorities. Saudi Arabia has no national health research priorities but priorities have been set for the King Abdel Aziz City for Science and Technology. Tunisia leaves decisions on research priorities to individual institutions.

Stated values for the NHRS

Only Oman and Tunisia have formal value statements to guide their NHRS (Table 5). Saudi Arabia has a proposed value statement for the system, but this has yet to be adopted.

Table 5. National health research system values

Oman	Tunisia	Saudi Arabia (proposed)
<ul style="list-style-type: none"> ▪ Quality of the research conducted ▪ Directed to meet the planning needs (for the priority problems of the community and health programs, vulnerable groups and health system problems) ▪ Encouragement of community participation and NGO involvement 	<ul style="list-style-type: none"> ▪ Ethics ▪ Excellence ▪ Equity and Fairness 	<ul style="list-style-type: none"> ▪ Adoption of agreed research ethics and professional health values ▪ Strict following of the strategic targets adopted by the National Centre for Health Research ▪ Equity and justice ▪ Consideration of special gender needs and social values of the Saudi society ▪ Adoption of decentralization measures when conducting health researches ▪ Continuous development and adoption of Quality Control Measures ▪ Best control and use of available resources, with the consideration of efficacy and efficiency in the process of health research financing ▪ Adoption of multidisciplinary and multi-sector team approach ▪ Strict following of transparency and open communications measures

In Bahrain the Ministry of Health has committed to ensuring that research adheres to good ethical practices, relevance to policy, service and equity. These values cover the Ministry of Health and external bodies if they utilize the ministry's facilities, funds, patients or records. A number of other countries (Jordan, Kuwait, Lebanon and Saudi Arabia) commit researchers to adhere to ethical principles, but have no wider statement of underlying values for the system. In Qatar, a values statement will be incorporated into principles of the NHRS structures they will establish.

Stated aims for the NHRS

Five countries (Table 2) have stated the major aims for their NHRS. In Jordan, the aims are expressed in the general vision for science and technology:

Our vision is the achievement of internationally reputable capacity in frontier sciences and technologies, and maximum benefit of their applications for the sustainable socioeconomic development of Jordan

Similarly, in Lebanon aims have been stated for the National Council for Scientific Research but not separately for the sub-committee that focuses on health.

Oman states its aims as:

- Conduct studies and research necessary to provide data and information that are required by the health system.
- Develop the technical capabilities and skills of the health research team on research design and methodology, also to develop and improve the capacity of research users at different levels to utilize the information as a tool for evidence-based planning.
- Develop the infrastructure of the health research system and ensure the quality of research.

For Tunisia the aims are expressed as:

Health research aims are the promotion of health, the resolution of the health problems and to develop the health system to better face present and future health problems.

Bahrain and Saudi Arabia have yet to adopt their proposed NHRS aims. In Bahrain, the following objectives have been proposed for the Ministry of Health:

- To improve the quality of health information.
- To increase the number of policies and decisions that are based on the best available evidence (based on quality research).

In Saudi Arabia, the proposed aims are:

The promotion of individual and community health. It should adopt an evidence-based research policy as a base for the generation of health regulations and policies intended to achieve improvement and further promotion of health service quality in the Kingdom of Saudi Arabia. It also aims at implementing the best quality measures in research execution process, and dissemination of these concepts.

Monitoring and evaluation of the NHRS

Only Oman has established a system of monitoring and evaluation for its NHRS. This is related to the implementation of research within the 5-year Health Development Plan. The specific research objectives are assigned measurable indicators and progress is reported on an annual basis.

In Tunisia, institutions are required to submit annual reports of their activity, but no further analysis of the documentation that would constitute a monitoring and evaluation system is reported. Jordan describes an institutional system of monitoring and evaluation, but no activity to collate this information to examine the system at national levels.

Research utilization

None of the countries reported systematic efforts to feed research results into decision-making within the health sector. Oman did cite some interesting examples of dissemination and utilization activities, including:

- conferences and workshops for dissemination and utilization of research outputs;
- workshops held for training on “utilization of research findings”;

- dissemination of results or recommendations through the Public Relations Department of the Ministry of Health to the media.

Oman also highlighted how an effective research priority setting process was a significant facilitator in research utilization as most research ideas originally came from the research users. In Bahrain clinical practice guidelines developed in conjunction with the Bahrain branch of the UK Cochrane Centre have been used to increase the use of evidence in Ministry of Health decision-making. Jordan, Kuwait and Lebanon reported ad hoc dissemination activities of a less comprehensive nature.

Other data

The data collected on institutions and relevant literature produced some useful information, for example, a bibliometric analysis of health research in Tunisia by Ben Abdelaziz et al; [12] however as there was considerable variation in the methods used by country teams to identify institutions, literature and other information, this part has not been reported in this paper.

4. Discussion

The mapping of governance and management mechanisms of national health research systems has provided valuable information that can be used by all the countries involved to improve these key aspects of their NHRS. This study has identified the fact that many of the countries do not have a formal NHRS. Instead there is considerable fragmentation and limited coordination between key parts of the system that have to collaborate if it is to demand, produce and use health-related research, and thus deal with the health, health system and health equity problems of the country. Many countries lack the basic building blocks required to construct a responsive and needs-driven health research system. However, there is considerable scope in these countries to improve the governance and management of the NHRS through the following priority actions:

1. Set rigorous national health research priorities;

2. Develop a national health research policy, on its own or as part of science, technology and innovation policy frameworks;
3. Establish formal governance and management structures that enable implementation.

These three elements can provide the foundations to further strengthen national research systems by:

- Defining underlying values and aims for the NHRS;
- Conducting effective monitoring and evaluation; and
- Developing systems to integrate research knowledge into decision-making processes at all levels of the health sector.

The issue of embedding and ingraining science in society and effectively using research knowledge and capacity for development has been identified as a significant problem in the Eastern Mediterranean Region. [3,4] The observed gaps in routine data to describe education commitments and knowledge creation support this claim, as does the finding that four of the countries have not yet identified their national health priorities. Building a functioning health research system with strong leadership at the governance and management levels can help to ensure that effective demand, production and utilization of research in the health sector can be realized.

A number of the countries that took part in this study have recognized these limitations and are in the process of establishing formal mechanisms to better coordinate their systems of health research. As a result of this study Tunisia and the Member States of the GCC have decided to engage in national health research priority setting processes in 2007. The study also identified interesting examples of good practice, notably from Oman and Tunisia, that can serve as models for others.

In addition to the immediate actions that countries can take to improve governance and management, there is considerable scope for the countries to move to a more detailed level of assessment, to examine the capacities of their NHRS and the extent to which it delivers research that can be used to improve health and health systems, and reduce inequity.

In this study countries with established governance and management structures for their NHRS, built these within general research councils. Further research on these systems will be useful to assess whether these structures fulfil the needs of the health sector, or whether such systems tend to favour research directed towards priority topics for science and technology and economic development at the expense of research to inform health-related decision-making.

In spite of the limitations of data collection caused by the need to obtain rapid and actionable results, the methods employed in this study have provided valuable evidence to allow country teams to assess what the priority areas are for further development of the governance and management of their health research systems in the immediate term. However, it is clear that once the large governance and management issues have been dealt with, further detailed mapping, profiling and performance assessment efforts will be required to provide more specific information, notably on the question of how the NHRS deals with the question of health equity.

The political and professional commitment of these 10 countries to analyse systematically their systems of health research is a core requirement of NHRS building. Countries in the Region that have not yet started examining their NHRS are encouraged to do so. The experience of this study has shown that a phased action-oriented approach can enable decision-makers to move quickly to system improvement initiatives.

5. References

1. King D. The scientific impact of nations. *Nature*, 2004, 430:311-316.
2. International Organizing Committee. Report of the International Conference on Health Research for Development. International Conference on Health Research for Development, Bangkok, 2000.
3. Maziak W. Health in the Middle East. *BMJ* 2006, 333(7573):815-816.
4. United Nations Development Programme Regional Bureau for Arab States. *The Arab human development report 2004*. New York, UNDP, 2005.
5. Pang T et al. Knowledge for better health: a conceptual framework and foundation for health research systems. *Bulletin of the World Health Organization*, 2003, 81(11):815-20.
6. World Health Organization Regional Office for the Eastern Mediterranean. *A study of national health research systems in selected countries of the WHO Eastern Mediterranean Region*. Cairo, WHO Regional Office for the Eastern Mediterranean, 2004.
7. Khoja T, Hussein M. *Glimpse on health research in the Cooperation Council States*. Riyadh, Executive Board of the Health Ministers' Council for the Gulf Cooperation Council, 2006.
8. United Nations Development Programme. *Human development report 2006: Beyond scarcity: Power, poverty and the global water crisis*. New York, UNDP, 2006.
9. Paraje G. Production of scientific articles in the Region of the Americas 1992-2001. 39th Advisory Committee on Health Research (ACHR), Santiago, Pan American Health Organization, 2005.
10. Paraje G, Sadana R, Karam G. Increasing international gaps in health-related publications. *Science* 2005, 308:959-960.
11. Hanney SR et al. Proposed methods for reviewing the outcomes of health research: the impact of funding by the UK's 'Arthritis Research Campaign'. *Health Research Policy and Systems*, 2004, 2:4.
12. Ben Abdelaziz A et al. Typologie de la recherche médicale tunisienne indexée dans Medline de 1965 à 1999. *La Tunisie Médicale* 2002, 80:548-555.

Annex 1

NHRS Mapping Questionnaire

1. **Governance and Management of the National Health Research System (NHRS)**

1.1 Describe the **governance structure** or mechanisms of health research in your country (in other words: what is the overall governance of your NHRS ?

- Provide the name of structure(s) or organization(s) involved and provide documents and/or references describing their roles and responsibilities where available.

Example: a national research commission; a medical research council tasked with overall review; a ministry of science and technology or of research

1.2 What is the actual ('day-to-day') **management or coordination mechanism(s)** of your NHRS?

- Provide names of structure(s), position(s) or organization(s) involved and provide documents and/or references describing their roles and responsibilities where available.

Example: director in ministry of health/higher education; president of the research council; joint body of universities; etc.

1.3 Does the Ministry of Health have a director/directorate/department that deals especially with and coordinates health research in your country?

- Provide the name and contact details of the responsible officer or structure;
- If there is no such office or officer in the Ministry of Health, are there offices in other government departments that take responsibility for health research?

- If so, provide the name and contact details of the responsible officer(s) or structure (s).

Example: Director of Health/Medical Research in MOH; or, officer in Ministry of Education, or Science and Technology, or Research, etc.

1.4 Does your country have a National Health Research Plan or **(specific) Health Research Policy?**

- If YES, provide a short description and relevant documents and/or references where available;
- If NOT, is health research addressed (specifically) in other ways, like: in the overall Health Plan or Health Act, or in a national research policy or plan, or in a national development plan or policy, or in documents of national bodies like research councils?
 - If so, provide a short description and relevant documents and/or references where available.

Example: If 'health research' is mentioned in any relevant national document, law, policy, mission statement, development plan ... etc ... please mention here.

1.5 Does your Ministry of Health have an **'active' list of National Health Priorities?**

- If YES:
 - provide a short description and relevant documents and/or references where available, and
 - List the 'top ten' health priorities;
- Give a date when these were officially adopted by the Ministry.

Example: list of 'official' health priorities; if the Ministry has no list but other national bodies do have, for example, a medical research council, answer the same questions.

1.6 Does your Ministry of Health have an '**active**' list of **National Health RESEARCH Priorities**?

- If YES:
 - provide a short description and relevant documents and/or references where available, and
 - List the 'top ten' health RESEARCH priorities;
 - Give a date when these were officially adopted by the Ministry

Example: list of 'official' health RESEARCH priorities; if the Ministry has no list but other national bodies do have, for example, a medical research council, answer the same questions.

1.7 Is there any **legislation** in your country that deals specifically with health research?

- If YES, provide a short description and relevant documents and/or references where available.

Example: the Health Act (if it does refer to health research); or a health research Act; or a Science and Technology Act; also decrees, regulations (under acts), by-laws in provinces that deal especially with health research; Acts that establish national health research body (e.g. Medical Research Council); etc

1.8 Does the NHRS have stated values (e.g. ethical conduct of research, issues of excellence, relevance, or equity; or any other values)?

- If YES, provide a short description and relevant documents and/or references where available.

Example: medical research council documents often have 'clauses' that deal with 'research to be conducted to the highest ethical standards' or 'research needs to be relevant to the country's population; etc

- 1.9 What are the **aims of the NHRS** or of major components of the NHRS (for example as might be included in a mission or vision statements) ?
- If YES, provide a short description and relevant documents and/or references where available.

Example: if there are no clear aims or mission statement, state here; otherwise, list actual aims and objectives as listed in mission statements, or in other relevant documents.

- 1.10 Does the NHRS have a system of **monitoring and evaluation**?
- If yes, provide the name(s) of the structure(s), mechanism(s), office(s), or organization(s) involved in monitoring and evaluation of the activities of the NHRS or of its major components, and provide relevant documents or references where available.

Example: the ministry may be required to provide an annual report to parliament on health research; or, the medical research council may be required to list its activities (and that of others) in its annual report; etc.

- 1.11 Describe the **ethical review** processes or structures for health research in your country.
- If YES, provide a short description of national or institutional ethics review of research protocols, and provide relevant documents and/or references where available.

Example: is there a national ethics committee that reviews proposals? Do research institutions have ethics committees of their own; is there legislation requiring such committees?; who deals with internationally sponsored research; is there review of private (for-profit) health research? etc

- 1.12 Describe how your country attempts to increase the **utilization of research results by policy-makers, managers, practitioners, public**; in other words, how are you promoting or communicating ‘evidence-based policy and decision-making’ ?
- Provide a short description of efforts or mechanisms to achieve this, and provide relevant documents and/or references where available.

Example: the ministry of health may invite WHO to address policymakers; organization of specific symposia or congresses; courses; links to the media; are there national guidelines on specific conditions; etc.

- 1.13 Describe **how the health service policy-makers** (the ministry) in your country **remain informed of advances in health and medical care** produced internationally?
- * Specifically, is there a regular mechanism whereby some institution in your country will keep the Ministry of Health up to date on advances in terms of the top-ten health priorities?*
- Provide a short description of efforts or mechanisms to achieve this, and provide relevant documents and/or references where available.

Example: there is no specific mechanism – it happens by ‘meetings’ or attending conferences; or, there is an annual health forum with academics, researchers, and ministry officials; or the country adopts WHO recommendations directly; Has the Ministry asked a University or Research Council to keep informing them about advances in health priority areas; or is there a ministerial ‘advisory committee’ (for example on medical technology)?

1.14 Who is responsible in your country for **dissemination of research findings** to the public?

- Provide a short description of how this is done, if at all, and provide relevant documents and/or references and/or examples where available.

Example: the director of research in the MOH; or academic institutions; or there is a press-office; etc

1.15 Who is responsible in your country for **monitoring and evaluation of the impact of new health policies or interventions** on health and development?

- Provide a short description of how this is done, if at all, and provide relevant documents and/or references and/or examples where available.

Example: the director of research in the MOH; or academic institutions; etc

1.16 Give a brief description of the system for collecting, analysing, and reporting of routine health information in your country.

- Provide a short description of how this is done, and provide relevant documents and/or references and/or examples where available.

Example: national statistical services; or registries; or major annual reports; or international reporting requirements; etc.

1.17 Describe how your country regulates the introduction of new health technologies, including drugs.

- Provide a short description of how this is done, and provide relevant documents and/or references and/or examples where available.

Example: national drug regulating office or agency; national food regulating agency; commission of experts or commission of ministry officials or of both; accept foreign institution's approvals; etc

- 1.18 Does the Ministry of Finance and the Ministry of Science and Technology (or their equivalents) have designated officials who deal with health/health sector/health research?

- If YES, give name(s), position(s), details of responsibilities.

Example: A Department of Finance official with specific liaison responsibility with Ministry of Health; etc

2. Institutions engaged in 'research for health'

2.1 Identification of **institutions that commission and conduct research for health** in your country: (Note: add additional rows as necessary):

Institution	Commission	Conduct
(a) Government departments and agencies <i>(this will include research institutes under government control, and it may include ministries of education, science and technology, agriculture and finance, among others; in big countries, provincial departments and agencies may also be of relevance to list here)</i>		
	Yes/no	Yes/no
(b) Health care system <i>(give the names of the major hospitals and teaching hospitals, health clinics, both the public and private sectors, or other important institutions in the health sector that commission or conduct research)</i>		
	Yes/no	Yes/no
(c) Higher education and (national) research institutes / laboratories <i>(Include degree or equivalent awarding tertiary education institutions in both the public and private sectors. This includes research institutes and experimental stations operating under the direct control of, administered by or associated with higher education establishments. It also includes non academic and foreign institutions)</i> NB. Medical Schools may fall under this category or under category (b) depending on the major source of its funding. For example, in some countries the medical schools fall directly under the ministry of health, and can then be listed in category b.		
	Yes/no	Yes/no

(d) Private non-profit organizations involved in research for health (this can include civil society organizations like charitable institutions, national non-governmental organizations (NGOs) , professional bodies (e.g. medical associations) and community organizations)		
	Yes/no	Yes/no
(e) Business enterprise or industry (Private for-profit) (any private for-profit company providing products or services whether national or foreign. This will mainly relate to pharmaceutical and biotechnology companies, but may also include clinical research organizations and consultancy firms if they commission or conduct research for health)		
	Yes/no	Yes/no
Institution	Commission	Conduct
(f) International research and development sponsors or partners involved in research for health (agencies, foundations and donors, including international organizations active in the country. Include all such institutions directly involved with health research)		
	Yes/no	Yes/no
(g) Are there any other institutions/commissions/structures/ councils/networks/fora etc. in your country that have an important impact on the activities of the NHRS Forum, research or professional networks, that commission or conduct research, and there were not mentioned above?		
	Yes/no	Yes/no

2.2 Identification of **Media organizations that play an active role in dissemination (and even conducting or commissioning) research for health** in your country.

- Provide a short description of how this is done, if at all, and provide relevant documents and/or references and/or examples where available.

Example: newspapers or television channels with regular health updates/health reporting, etc

3. **Key stakeholders involved in ‘research for health’ in your country**

3.1 From the all institutions, commissions, other structures and mechanisms identified above - identify the positions and institutions that are the **most influential in determining health research** in your country.

- Provide a short description of these and how they influence the NHRS, if at all, and provide relevant documents and/or references and/or examples where available.

Example: list top 3 most influential stakeholders

4. **Available literature and data review on ‘research for health’ in your country**

4.1 What are the most important or **most used previous analyses, reports or information sources** on health and health research systems in your country (examples are: World Health Survey, Demographic and Health Surveys, Surveillance systems, Surveys of health systems capacity and activity, Resource flows studies, bibliometric studies, Health Research System Assessments, etc).

- Provide a short description of these, and provide relevant documents and/or references and/or examples where available.

Example: A specific annual report of the Ministry; WHO collaborative studies; health priority assessments; technical reviews by specific topics; etc

Definitions

Dissemination

The dissemination is the process of taking the reports of the research findings and making them available to potential users of the information. This is considered more than the passive production of academic publications, which are classified as primary outputs of research. Dissemination activities may take the form of presentations to academics and other users, media activities, the production of targeted briefs, and study or training days.

Governance

NHRS governance sets out the framework of relationships, systems, processes and rules for making decisions within the system. It also provides the structure through which the system's objectives are set, as well as the means of attaining and monitoring the performance of those objectives.

Health policy and intervention development

The term policy is taken in its widest sense and can refer to government, health service management, practitioner, or other related policies. This may involve legislation, guidelines, care pathways, treatment protocols or other form of policy. Interventions refer to health care services and methods of services delivery as well as drugs, techniques and devices.

Health policy or interventions adoption

For research findings to result in improvements in health or economic development, there generally has to be some behavioural change by policy makers, managers, practitioners or the public. This may involve the implementation of new policies, the establishment of new services, the use of new drugs or treatments, or changes to lifestyle.

Legislation

For purposes of this questionnaire, include all formal legal documents that governments use to influence society: acts, laws, decrees, policies, 'white papers', other 'official statements by a ministry.

Management

Management characterises the process of leading and directing the operations of the NHRS. The distinction between governance and management is that governance covers what the system should do, how it should work and what measures should be taken to assess whether it achieves its objectives, whereas management relates to the planning and execution of the activities to make this happen.

National health research system (NHRS)

The total of efforts in health research in a country: it includes public and private sectors. NHRS are described by their 5 components by COHRED and WHO: i) governance and stewardship, ii) financing, iii) capacity building, iv) knowledge generation, and v) knowledge translation and utilisation. Any effort or institution or 'mechanism' that is important in these five areas can be considered as part of the NHRS.

Routine health information systems

Health information systems should provide data on at least one of the following:

- health determinants (socioeconomic, environmental behavioural and genetic factors) and the contextual and legal environments within which the health system operates;
- inputs to the health system and related processes including policy and organization, health infrastructure, facilities and equipment, costs, human and financial resources and health information systems;
- the performance or outputs of the health system such as availability, quality and use of health information and services;
- health outcomes (mortality, morbidity, disability, well-being, disease outbreaks and health status); and

- health inequities in determinants, coverage and use of services, and outcomes, including key stratifiers such as sex, socioeconomic status, ethnic group and geographical location.

Source: Abouzahr, C, Boerma T. Health information systems: the foundations of public health. *Bulletin of the World Health Organization*, 2005, 83: 578–583.

Health research

The generation of knowledge that can be used to promote, restore, maintain protect, monitor and/or conduct surveillance of the health of populations. It includes biomedical research, which comprises the study of detection, cause, treatment and rehabilitation of persons with specific diseases or conditions, the design of methods, drugs and devices to address these health problems, and scientific investigations in such areas as cellular and molecular bases of disease, genetics and immunology. It also includes clinical research, which is based on the observation and treatment of patients or volunteers; epidemiological research, which is concerned with the study and control of diseases and of exposures and other situations suspected of being harmful to health; social science research, which investigates the broad social determinants of health; behavioural research, which is associated with risk factors for ill health and disease with a view to promoting health and preventing disease; operational research on health systems and how these can be improved to achieve desired health outcomes, including project or programme evaluation; and research capacity strengthening activities aimed to increase or strengthen individual or institutional capacities to conduct research.

The governance and management processes of national health research systems require good information, and success depends on transparent and inclusive evidence-based decision-making. In a collaboration between WHO, COHRED and the Health Ministers' Council for Cooperation Council States, it was decided, in 2005, to address the question of how to begin strengthening the capabilities of health research systems to produce research addressing the national needs. A study of 10 countries showed the need to strengthen the national health research systems by different degrees in all the countries concerned.