Assessing National Health Research Systems in the WHO African Region

2018

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Contents

List of Tables

List of Figures

Foreword

The commitment to strengthening national health research systems (NHRS) dates as far back as 2004, when a landmark Ministerial Summit on Health Research was held in Mexico. The Ministerial Conference on Research for Health in the African Region held in Algiers (2008) on the theme: "Narrowing the knowledge gap to improve Africa's health", committed to strengthening the generation of knowledge and narrowing the gap to improve Africa's health development and health equity. Despite the commitments made, NHRS in the WHO African Region have remained weak. In addressing this, the Regional Committee for Africa session held in N'Djamena in 2015 endorsed the "Research for health: a Strategy for the African Region, 2016-2025" report, which seeks to foster the development of a functional NHRS that generates scientific knowledge for developing technologies and systems and services needed to achieve universal health coverage.

The WHO African Region is committed to strengthening the research capacity of its Member States and supporting the implementation of the regional research strategy. This report is in line with our commitment to regularly assess progress in implementing the research strategy at the country level. The report highlights progress made at the regional and country levels since the baseline was undertaken in 2014.

This report provides guidance to ministries of health in developing interventions and making investments to strengthen NHRS in their countries. Furthermore, stakeholder actions and investments in health research should consider the identified areas of weakness, as well as best practices that can be scaled up, as presented in this report.

Acknowledgments

Executive summary

Background: Sustainable Development Goal (SDG) 3 commits governments around the world to ensuring health security and promoting well-being for all, at all ages. Central to the health SDG 3 is the universal health coverage (UHC) target, which seeks to ensure that all people have access to high quality, effective and affordable health care services. Achieving UHC, however, is not without challenges, such as limited resources, the double burden of diseases, climate change, and the demographic and epidemiologic transition. Other challenges include weak health systems, identifying the most effective and sustainable ways of delivering medical interventions to the populations most in need, discovering new and improved interventions urgently, and ensuring affordable delivery and scaling up the coverage of existing and new interventions. As the road to UHC will be unique for each country, national health research systems must take the lead in designing tailored solutions by providing contextualized evidence. At a regional level, in order to stimulate and promote health research in Africa, the Sixty-fifth session of the Regional Committee for Africa endorsed the report of the Secretariat entitled, "Research for health: a strategy for the African Region, 2016-2025", whose objectives are to:

(a) Establish effective research for health governance;
(b) Improve the building and sustenance of human, physical and institutional capacities on research for health;
(c) Strengthen production and use of research to enhance the performance of health systems;
(d) Establish sustainable research for health financing;
(e) Establish mechanisms for tracking health research investments.

The strategy lays down priority actions for Member States, under each objective. WHO is tasked with tracking the progress of the implementation of this strategy in the Region, using appropriate tools developed in consultation with Member States. This survey was undertaken to fulfil the commitment to continued monitoring of implementation of the research strategy.

Methods: Survey data were collected from all the 47 WHO African Region (AFR) Member States, between 2017 and 2018, using the African national health research systems barometer algorithm, which was developed in response to a recommendation of the African Advisory Committee for Health Research and Development of WHO. Survey data collected from all the 47 Member States were analyzed quantitatively to assess progress towards attainment of indicators, and indices calculated to qualitatively explore enabling and constraining factors to strengthening the national health research systems. The barometer scores for each country were calculated, and the performance interpreted according to a set of values ranging from 0% to 100%.

Results: Thirty-nine out of the 47 countries responded to the questionnaire, giving a response rate of 83%. The assessment showed an improvement in the performance of NHRS, with the overall barometer score for the African Region improving from 42% in 2014 to 61% in 2018,

which is above the average of 50%. All the indicators under governance for research improved, with more countries developing research policies and strategies, laws governing research, ethical committees and research priority lists. This led to an overall gain of 72% in the average score for the governance of Research for Health (R4H) index, compared to 61% in 2014. However, enforcement of legislation remains weak. Under "developing and sustaining resources for R4H", more countries have established research promotion units in ministries of health, introduced health research training programmes at universities, and set up research institutes and councils. Major challenges include the dwindling numbers of senior researchers and lack of carrier paths for researchers. This resulted in a significant improvement in the regional average score from 35% to 61%. Under "producing and using health research", a majority of countries already had a research and development coordination mechanism. Only a modest improvement was registered in the countries with a knowledge translation platform. The regional average score for producing and using research improved by 23%, from 32% in 2014 to 55% in 2018, even though not all the countries provided data on regional R4H publications per 100 000 population index (RPPCI). Regarding "financing for health research", while more countries do have a dedicated budget line for research, the actual investment remains very low. The average index for financing R4H improved from 27% in 2014 to 44% in 2018. Among the 39 countries surveyed, the average NHRS performance was less than 50% in 16 (41%) countries, compared to 30 (64%) countries in 2014.

Conclusion: Since the last survey in 2014, there has been an improvement in the majority of countries in the African Region. Achievement of the objectives for the Research for Health strategy for the African Region, although varied, is improving. With an overall improvement in governance for research, the highest performance under this objective was in strengthening ethics for research. A source of concern is the number of countries yet to develop policies (12), strategies (20) and legislation (17) to guide the conduct of and investments in research. "Developing and sustaining resources for R4H" registered the highest improvement in universities with a training programme in research and a research institute. Sixteen countries are still without a research promotion unit at the Ministry of Health, four are yet to establish a training programme, while 11 do not have research institutes. Under "producing and using research", significant improvements have been made in establishing a research and development coordination mechanism, and indeed, the 2020 target has already been attained. However, 16 countries are yet to establish a knowledge translation platform to foster uptake of research into policy. Government financing for research remains low, with only two countries investing 2% of their health budget in health research. Financing for health research is heavily dependent on donor funding. The NHRS scores for the individual sub-functions are key to guiding policy-makers in locating sources of poor performance and designing and developing interventions to address them.

1. Introduction

Sustainable Development Goal (SDG) 3 commits governments around the world to ensuring health security and promoting well-being for all, at all ages. Central to the health SDG is the universal health coverage target, which seeks to ensure that all people have access to quality, effective and affordable health care services. Achieving UHC, however, comes with challenges such as, limited resources, the double burden of diseases, climate change, and the demographic and epidemiologic transition. Other persistent challenges include weak health systems, identifying the most effective and sustainable ways of delivering medical interventions to populations most in need, reaching unreached populations, discovering new and improved interventions urgently, and ensuring affordable delivery and scaling up coverage of existing and new interventions. Additionally, the challenges of health and health systems differ from one setting to another, and so must the necessary interventions. National research health systems must, thus, play a leading role in providing contextualised evidence and generating local solutions.

The World Health Report: Research for Universal Health Coverage (2013),[1] strongly emphasizes the need to support the health research community within countries and worldwide. The report emphasizes three themes:
- Universal health coverage, with full access to high-quality services, which cannot be achieved without evidence from research;
- All nations should conduct and use research;
- System approaches are needed to develop locally informed national research agendas, to raise funds, strengthen research capacity, and make effective use of research findings. Overall, the study advocates for capacity-building in national health research systems rather than selected sectors driven by markets, interest groups and technocrats.

At the regional level, in an effort to stimulate and promote health research in Africa, the Sixty-fifth session of the WHO Regional Committee for Africa endorsed the report entitled, "Research for health: a strategy for the African Region, 2016–2025". Acknowledging Africa's low contribution to global health research, the weak capacity for health research in the Region, the low priority accorded to research as a tool for solving the Region's health needs, and the limited use of research evidence in decision-making, the strategy set out to foster the development of functional national health research systems that would generate scientific knowledge for developing technologies, as well as systems and services for achieving UHC. The objectives of the strategy are to:

(a) Establish effective research for health governance;
(b) Improve the building and sustenance of human, physical and institutional capacities in research for health;
(c) Strengthen production and use of research to enhance the performance of health systems;
(d) Establish sustainable research for health financing;

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[1]   WHO. The World Health Report 2013: Research for Universal Health Coverage. Geneva: WHO; 2013.

(e) Establish mechanisms for tracking health research investments.

The strategy lays down priority actions for Member States under each objective.

Implementing the proposed interventions will strengthen the capacity of the national health research system to facilitate research generation, dissemination and utilization to address the health needs of the population.[2] The NHRS is defined as "the people, institutions, and activities whose primary purpose is to generate high quality knowledge that can be used to promote, restore, and/or maintain the health status of populations".

WHO was tasked with tracking the progress of the implementation of this strategy in the Region, using appropriate tools developed in consultation with Member States.

In implementing the assigned role of reporting, the assessment of the NHRS has been undertaken following a methodology developed specifically for WHO/AFRO. Kirigia et al (2015; 2016) developed a barometer which assesses the performance of the NHRS of Member States against a set of criteria and, this has been employed in undertaking this assessment. This assessment follows up on the baseline undertaken in 2014.

1.1 OBJECTIVES OF THE ASSESSMENT

The objectives of the assessment are to:

(a) Respond to the request to WHO in the "Research for health: a strategy for the African Region, 2016–2025" report, to monitor and report regularly on the implementation of the priority interventions within the strategy, to the WHO Regional Committee for Africa every two years;

(b) Assess progress towards the strengthening of NHRS in the WHO African Region from 2014.

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[2] Pang T, Sadana R, Hanney S, Bhutta ZA, Hyder AA, Simon J: Knowledge for better health – a conceptual framework and foundation for health research systems. Bulletin of the World Health Organization 2003; 81(11): 815-820.

2. Methodology

Employing mixed methods, we undertook a survey in all the 47 countries using a semi-structured questionnaire. Out of the 47 WHO/AFRO countries approached, 39 participated in the survey, representing a return rate of 82.98%. The study sought to assess the extent to which countries were implementing priority actions to strengthen their national health research systems, as agreed in the regional research strategy (see Table 1).

Table 1: Parameters assessed under the different objectives
Objective
1. Governance
• Countries with valid health research policies, strategic plans, and priority lists
• Countries with legislation on R4H
• All countries with national or institutional ethics review committees
• At least 80% of countries have a national or institutional ethics review committee assessing and providing feedback within three months.
2. Creating and sustaining resources
• Countries with a health research promoting unit within the MOH
• Countries with universities/colleges that have a training programme in health research
• Countries with a national health research institute/council
3. Producing and using health research
• Countries with a research and development coordination mechanism
• Each country to increase the number of articles published in peer reviewed journals by at least 30%.
• Countries with a knowledge translation platform
4. Financing
• Countries that have a dedicated budget line for R4H
• Countries investing at least 2% of the national health budget in R4H
• Countries investing at least 5% of health sector development assistance in R4H
• Countries regularly tracking R4H spending from all sources

The assessment of the NHRS was undertaken, following the development of the African National Health Research System barometer by Kirigia et al (2015, 2016), to ascertain the performance of Member States' NHRS against a set of criteria as shown in Table 1. Data were

collected between December 2017 and August 2018. Respondents included heads of research institutions, focal points for research in ministries of health and WHO country office health systems focal points.

The quantitative analysis assessed performance of countries' NHRS against agreed indicators and derived performance scores. The formulae used for calculating the indices for the sub-functions are very similar to those used by Kirigia et al in 2015 and the United Nations Development Programme, for their calculation of the human development index and the health development governance index.

Qualitative data sought to explore the enabling and constraining factors for strengthening NHRS. Quantitative data were analysed in excel spreadsheets, while qualitative data were coded manually and analysed using thematic analysis. The results of the qualitative data analysis are presented in the report to tell the story behind the numbers.

3. Results

Forty-seven countries (100% response rate) and 39 out of 47 countries (83% response rate) participated in the 2014 and 2018 barometer surveys respectively.

3.1 OVERALL REGIONAL NHRS PERFORMANCE

Just as in 2014, the NHRS was categorized as below average, if the barometer score was less than 50%, average, if the score was 50%, and above average if the score was over 50%. There was overall improvement in strengthening the NHRS, as evidenced by the regional average overall R4H barometer score (RHRSBScore) at 0.61 (61%) in 2018, compared to 0.42 (42%) in 2014 (See Table 3). This indicates that the performance of NHRS in the African Region significantly improved from below average in 2014, to above average in 2018.

To understand the source of the poor score and the performance of each NHRS function and its related sub-functions were further examined and are summarized in Tables 2 and 3, and will be discussed in turn.

3.2 ESTABLISH EFFECTIVE RESEARCH FOR HEALTH GOVERNANCE

Development and enforcement of strategic documents and processes — legislation, policies, strategies, and functional ethical review committees — serve to strengthen government capacity to coordinate research and ensure harmonization and alignment of research activities and investments. The Regional average barometer score for governance for R4H is above average and further shows an improvement from 0.61 (61%) in 2014 to 0.72 (72%) in 2018. Significant improvement was noted in countries developing research priority lists (a barometer score of 79% in 2018 compared to 53% in 2014). Some of the parameters under governance are doing better than others. For example, the majority of countries have focal points for research in ministries of health and also have ethical review committees in place (95%). Also, the proportion of countries with research policies, strategies and legislation increased between 2014 and 2018, albeit marginally. The significant number of countries without policies (12), strategies (20) and prioritized research agendas (9) is a cause for concern.

3.2.1 Development of national health research policy and national health research strategic plan

A number of countries are at various stages of development of their national health research policies. Burundi and Ethiopia report that they have not yet started to develop their policies. The Gambia, on the other hand, acknowledges that the country's health research policy needs re-evaluation, as it has been extended beyond its intended timeline. Kenya has reached the final stages of its draft health research policy, while Liberia's has been developed, validated and is awaiting dissemination. Mauritania has set up a higher council for scientific research and innovation, chaired by the President of the Republic, and is finalizing a national scientific research strategy. In 2017, the country established the national health research commission,

with a responsibility for drafting health research policies and strategies. Demonstrating progress in policy-making, Nigeria's national health research policy and priorities have been completed, validated and now await dissemination.

Sixty-five per cent of countries possess a national health research strategic plan, albeit at varying levels, ranging from expired, under development, extended to recently launched strategies.

3.2.2 Health research legislation

There are different approaches to putting in place legislation for health research. Some countries have health research legislation embedded in other overarching laws, while others use several instruments. For example, The Gambia's health research legislation is embedded in the National Health Policy, whereas Ghana's relevant laws fall under the Ghana Health Service and Teaching Hospital (1996) Act (ACT 525) and the Public Health Act section on clinical trials. Sierra Leone uses the reviewed Public Health Act, while Tanzania uses the NIMR Act no. 23 of 1979. Kenya uses the Promotion and Conduct of Research for Health - contained in Health Act no. 21 of 2017, Part XIV, and the Science Technology and Innovation Act no. 28 of 2013. Uganda regulates health research using the Uganda National Health Research Organization Act 2009, while Zambia uses the National Health Research Act No. 2 of 2013.

Lesotho is in the process of enacting a comprehensive public health act that will incorporate issues on health research. However, the bill has been under consideration for almost two years. Liberia is considering a draft national public health law, while Madagascar uses Law no. 2011-02 of 15 July 2011 on the public health code. Benin uses Law no. 2010-40 of 8 December 2010 on the code of ethics and conduct for health research. Malawi uses the Science and Technology Act of 2003; Mauritius uses the Clinical Trials Act of 2011 and Nigeria uses the National Health Act of 2014. Rwanda reports that it uses a number of laws to govern health research. These include: Rules and Regulations for Research Activities in Rwanda (2015); the law regulating therapeutic, educational and scientific utilisation of organs and products of the human body; the law establishing the National Institute of Statistics of Rwanda (NISR) and determining its mission, organization and functioning; Law no 01/2005 regulating the organization of statistical activities in Rwanda; and Ministerial instructions 003/2010 regulating research activities in Rwanda. Sixteen out of 39 countries have no legislation on R4H and two out of 39 countries do not have ethical review committees.

3.2.3 Enabling and constraining factors

The lack of strategic documents impacts negatively on government's capacity to coordinate research. The respondents of the survey attested to the presence of good, legal governance and regulatory frameworks as enabling factors, while the lack of proper systems and coordination among government ministries and research institutions were cited as constraints to strengthening NHRS, as was affiliation with the research institutions. When governments did

not own their prioritized research agendas, there were challenges to implementing them. Respondents also reported that there were few nationally and institutionally initiated and funded health research studies, possibly owing to the absence of a well-coordinated institutional health agenda-setting mechanism.

Although ethical reviews are in place in almost all countries, constraining factors include lengthy clearance processes because of bureaucracy. Compliance with data protection laws was reported as a cause for delay in the commencement of research projects. Given that health research always requires strict compliance with ethical and data protection, it is important that governments, research institutions and universities train key staff in data management and protection.

While improvement in the number of countries developing research priority lists is laudable, the challenge is getting these implemented, given the low investment in health, both from governments and development assistance (see Table 3).

3.3 IMPROVE BUILDING AND SUSTENANCE OF HUMAN, PHYSICAL AND INSTITUTIONAL CAPACITIES IN RESEARCH FOR HEALTH

This entailed building institutional capacity for research with specific reference to availability of a research promotion unit within the MoH, universities/colleges that have a training programme in health research and national health research institutions. Significant increases are noted in the proportion of countries with universities/colleges that have a training programme in health research, from 20% in 2014 to 90% in 2018, and the proportion of countries with a national health research institute or council, from 40% to 72% over the same period. Worthy of note is the fact that 16 out of 39 countries lack a health research promotion unit within the MoH, while 11 out of 39 countries do not have a national health research institute or council.

The Regional average barometer score for developing and sustaining resources for R4H significantly improved from 35% to 61% because of positive gains by all the contributing indexes in this category (Table 3). With regard to the detailed barometer scores, the most improved indices in this category are the Regional Research for Health programme staff density index (RHRHRI), regional universities with faculties of health sciences/medicine (RUFHSI) and the Regional Research for Health programme (RHRPRI). Kenya has a health research technical and support staff of 1365 while Burkina Faso has 500, translating into a high staff density index. Under the regional universities with faculties of health sciences/medicine index, the following countries indicated that they had several universities conducting health research: Ethiopia (35), South Africa (24), Kenya (12), Ghana (10) and Angola (7). In addition, there was significant improvement in the RHRPRI.

Table 2: Summary of the key indicators of achievements in the four areas

Objective	Baseline 2014 (n=47)	Target by 2025	Achievement (% of countries) 2018 (n=39)	Countries not meeting the target (out of 39 countries)
(A) Governance				
1. **Countries with valid health research policies, strategic plans, and priority lists**	60%	100%.	65%	• <u>Health research policies</u> Angola, Botswana, Cabo Verde, Democratic Republic of the Congo, Eswatini, Ghana, Guinea-Bissau, Madagascar, Malawi, Mauritania, Mauritius, Zimbabwe (12) • <u>Strategic plans</u> Angola, Botswana, Burundi, Cabo Verde, Congo, Democratic Republic of the Congo, Eswatini, Gabon, Ghana, Guinea-Bissau, Madagascar, Mauritania, Mauritius, Mozambique, Namibia, Nigeria, Sierra Leone, South Sudan, Uganda, Zimbabwe (20) • <u>Research priority lists</u> Angola, Gabon, The Gambia, Mali, Namibia, Seychelles, Sierra Leone, Uganda (8)
2. **Countries with legislation on R4H**	52%	80%	(22/39) 56%	Angola, Botswana, Burundi, Cabo Verde, Cote d'Ivoire, Democratic Republic of the Congo, Eritrea, Eswatini, Ethiopia, Guinea-Bissau, Lesotho, Madagascar, Mauritania, Namibia, Seychelles, Sierra Leone, South Sudan (17)
3. **All countries with national or institutional ethics review committees**	90%	100%	(37/39) 95%	Benin, Madagascar (2)
4. **At least 80% of countries have a national or institutional ethics review committee assessing and providing feedback within three months**	80%	100%	(37/39) 95%	Benin, Madagascar (2)
(B) Creating and sustaining resources				
1. **Countries with a health research promoting unit within the MoH**	59%	75%.	(23/39) 59%	Angola, Benin, Cote d'Ivoire, Democratic Republic of the Congo, Eswatini, Gabon, Ghana, Guinea-Bissau, Mali, Mauritania, Mauritius, Mozambique, Namibia, Seychelles, Sierra Leone, Uganda (16)
2. **Countries with universities/colleges that**	20%	40%.	(35/39) 90%	Cabo Verde, Guinea-Bissau, Mauritius, Seychelles (4)

Objective	Baseline 2014 (n=47)	Target by 2025	Achievement (% of countries) 2018 (n=39)	Countries not meeting the target (out of 39 countries)
have a training programme in health research				
3. Countries with a national health research institute/council	40%	55%	72%	Botswana, Burundi, Cote d'Ivoire, Eritrea, Eswatini, The Gambia, Lesotho, Namibia, Seychelles, Sierra Leone, South Sudan, (11)
(C) Producing and using health research				
1. Countries with an R & D coordination mechanism	40%	85%	(33/39) 85%	Senegal, Ethiopia, Gabon, Mauritania Mauritius, Burundi (6)
2. Each country to increase the number of articles published in peer reviewed journals by at least 30%		30%		Data on peer-reviewed articles not provided
3. Countries with a knowledge translation platform	26%	100%	(23/39) 59%	Angola, Burkina Faso, Benin, Burundi, Cabo Verde Nigeria, Gabon, Congo, Sierra Leone, South Sudan, Eswatini, Namibia, Mauritania, Cote d'Ivoire, Democratic Republic of the Congo, Eritrea, (16)
(D) Financing				
1. Countries that have a dedicated budget line for R4H	52%	75%	(24/39) 62%	Angola, Burundi, Benin, Cabo Verde, Congo, Cote d'Ivoire, Eritrea, Eswatini, Gabon, Guinea-Bissau, Mauritania, Namibia, Seychelles, Sierra Leone, South Sudan (15)
2. Countries investing at least 2% of the national health budget in R4H	2%	25%	(2/24) 8.3% Cameroon/Mali	Benin, Botswana, Burkina Faso, Eritrea, Gabon, Ghana, The Gambia, Lesotho, Liberia, Madagascar, Malawi, Mauritius, Rwanda, Zimbabwe Mozambique, Niger, Nigeria, Senegal, South Africa, Tanzania, Uganda, Zambia (22)
3. Countries investing at least 5% of health sector development assistance in R4H	2%	25%	(1/24) 4.2% Cameroon	Botswana, Benin, Burkina Faso, Eritrea, Gabon, The Gambia, Ghana, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Mozambique, Niger, Nigeria, Rwanda, Senegal, South Africa, Tanzania, Uganda, Zambia, Zimbabwe (23)
4. Countries regularly tracking R4H spending from all sources	20%	50%	(37/39) 95%	Cabo Verde, Mauritania (2)

Table 3: Regional health research system barometer scores

Health research system barometer parameters	Regional barometer score		
	(2014) n=47	(2018) n=39	p value
A. Governance of research for health			
1. Regional health research policy index (RHRPI)	0.49	0.67	0.047
2. Regional health research law index (RHRLI)	0.40	0.56	0.139
3. Regional strategic health research plan index (RSHRPI)	0.47	0.49	0.853
4. Regional ethical review committee index (RERCI)	0.91	0.95	0.474
5. Regional health research priority list index (RHRPLI)	0.53	0.79	0.012
6. Regional health research focal point index (RHRFPI)	0.83	0.85	0.802
Average score for the governance of R4H	**0.61**	**0.72**	**0.283**
B. Developing and sustaining resources for R4H			
7. Regional universities with faculties of health sciences/medicine (RUFHSI)	0.05	0.25	0.008
8. Regional health research institutes or councils (RHRCI)	0.55	0.72	0.105
9. Regional R4H programme (RHRPRI)	0.51	0.72	0.047
10. Regional R4H programme staff density index (RHRHRI)	0.0006	0.53	<0.001
11. Regional NGO R4H index (RNGOI)	0.64	0.79	0.128
Average score for developing and sustaining resources for R4H	**0.35**	**0.61**	**0.016**
C. Producing and using research			
12. Regional R4H programme action plan index (RHRPAI)	0.34	0.59	0.020
13. Regional knowledge translation platform index (RKTPI)	0.32	0.59	0.012
14. Regional health research management forum index (RHRMFI)	0.51	0.46	0.644
15. Regional R4H publications per 100 000 population index (RPPCI)	0.10		
Average score for producing and using research	**0.32**	**0.55**	**0.032**
D. Financing of R4H			
16. Regional budget line for R4H index (RBLHRI)	0.47	0.62	0.165
17. Regional government spending on R4H index (RHRBI)	0.06	0.23	0.019
Average score for financing of R4H	0.27	0.43	0.016
Regional health research systems barometer (RHRSB) average score	**0.42**	**0.61**	**0.040**

3.3.1   Enabling and constraining factors

Among the enabling factors identified were the availability of experienced multidisciplinary teams, young medical and biomedical professionals, keen on boosting research and producing good quality research that will impact on society and policy. Key among the constraints were demotivated staff, inadequate mechanisms for career progression and lack of experienced researchers, likely to lead to low capacity for research. Other constraints were the competing interests between conducting research and teaching, and the limited capacity to train researchers. The combination of the brain drain and retirement of competent senior research scientists is a double blow to maintaining a cohort of competent researchers on the continent. This implies that training and motivation are key areas for consideration by the leadership of research institutions and policy-makers. Access to research funds, especially on the international stage, is very competitive, and local scientists need to develop the skills to write good project proposals. Furthermore, respondents cited the lack of infrastructure and equipment as some of the constraints to undertaking biomedical and clinical research.

Respondents noted that research capacity issues could be dealt with by partnering with other universities and research consortiums to harness expertise and resources. In building partnerships, however, trust was crucial, while a partnership framework (for instance, a memorandum of understanding (MoU)) should be developed to guide working arrangements.

3.4 PRODUCING AND USING RESEARCH

In improving production and use of health research, emphasis should be on: (a) the institutionalization of research and development of coordination mechanisms between ministries of health and other relevant ministries; (b) the increasing number of health research outputs, including articles published in peer-reviewed journals; and (c) putting in place knowledge translation platforms. Significant increases are noted in countries with a research and development coordination mechanism - from 40% to 85%, already attaining the 2025 target. The proportion of countries with a knowledge translation platform increased from 29% to 59%, although 16 out of 39 countries are yet to put such platforms in place.

The regional average barometer score for production and use of research improved significantly by 23%, from 32% in 2014 to 55% in 2018, even though data on regional R4H publications per 100 000 population index was not provided by all countries. The Regional knowledge translation platform index (RKTPI) increased significantly to 59%. In addition, the Regional R4H programme action plan index (RHRPAI) increased, due to a significant number of countries reporting positively to the presence of an action plan for R4H. On the negative side, however, the Regional health research management forum index (RHRMFI) dropped by 5% since most countries (54%) indicated an absence of health research management forums in their countries.

Although there was an improvement in the score for the translation platform index, this area still poses significant challenges for member countries. For example, recognizing these

challenges, Kenya reports that its translation platform is undergoing development, under the Kenya Health and Research Observatory. The major challenges they identified include lack of technical and financial support to complete the project according to set targets. The Gambia reported that although their annual national health research dissemination forum was implemented for two years, the event had not been held since 2014, due to funding constraints. This forum was critical for linking institutions, researchers, students, health policy-makers and programme managers to engage in knowledge exchange and potentially influence evidence-based policy-making. Lesotho reported that although the National Health Research Forum was conducted in March and September every year, only staff members at the central level could attend, while those in the periphery failed to attend because of competing priorities. There were also delays in the use of research findings in planning and implementation. Other countries, such as Guinea-Bissau are in the process of creating the translation platform, with the process being driven by the national committee for research results validation. Malawi reported modest achievements; and despite the lack of dedicated funding and personnel for the translation platform, they have published five policy briefs since 2013. Tanzania's platforms, which include the National Health Research Policy and Systems (NAHEPOS) hub, the Tanzania National Health Research Forum (TANHER Forum), and the Health Policy Dialogue, are coordinated by the National Institute for Medical Research (NIMR). Tanzania also reports that despite the strides made, challenges remain, including lack of funds for convening national health policy dialogue meetings, failure by researchers to present or prepare policy briefs/documents for discussion, poor adoption of research findings by the Ministry of Health because of lack of coordination and the fact that most research projects funded by development partners may not be addressing local health research priorities.

3.5 FINANCING RESEARCH FOR HEALTH (R4H)

In improving financing for research, the strategy articulated the need for countries to: have a dedicated budget line for health research within the Ministry of Health's budget; invest at least 2% of the national health budget in health research and at least 5% of development assistance funds earmarked for the health sector in health research; and regularly track health research spending from all sources.

The Regional average barometer index for financing R4H improved significantly from 42% to 61% between 2014 and 2018, largely driven by countries creating a budget line for research. However, this index (RHRBI) should be interpreted with caution, as it only represents countries that have submitted their government budget allocations to research. A total of 24 out of the 39 countries analysed submitted their country budget allocation (14 EDCTP* and 10 non-EDCTP**) as summarized in Table 3.

The proportion of countries with a dedicated budget line for R4H increased from 52% to 62% between 2014 and 2018. However, 18 countries are yet to do so. The proportion of countries regularly tracking R4H spending from all sources increased by 75% over the same period (See Table 3). Actual financial investment in R4H is yet to be realized, given the fact that 21 out of 39 countries are yet to invest 2% of their national health budget, while 22 out of 39 countries are yet to invest 5% of their health sector development assistance in R4H.

In terms of contributions to research for health finance and budgets, Figure 1 (1 being the most important contributor and 6 the least important) shows that countries rank multilateral and bilateral donors as the major source of funding for research for health. Figure 1, a radar graph derived from 23 out of 39 countries that responded to section 8.4 in the questionnaire shows government ranking third, after multilateral and bilateral donors (first), and international nongovernmental organizations (NGOs) (second). The private sector ranks fourth, and in the fifth place are local NGOs. This illustration raises two important issues: long-term sustainability of research funding and the level of priority accorded to research. Increasing domestic financing for research will improve prioritization of locally relevant research to generate home-grown solutions.

Figure 1   Health sector research financing and budget contribution, ranked in order of decreasing importance[3]
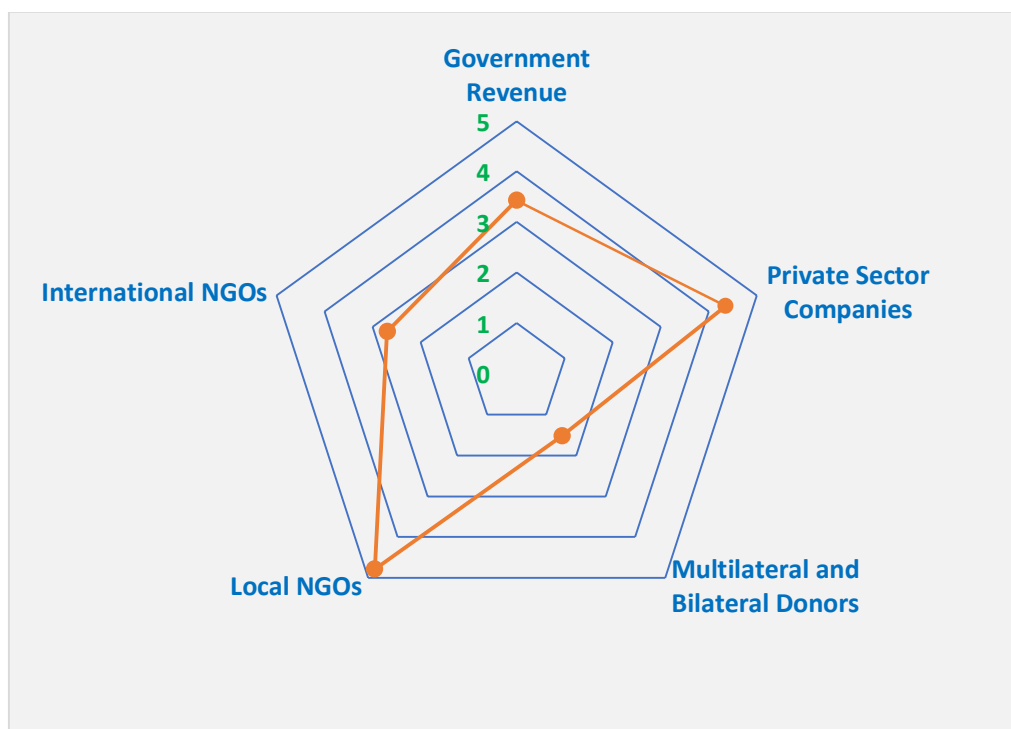
Legend to figure 1: 1 = Most important contributor and 6 = least contributor

3.5.1   Enabling and constraining factors

Domestic financing was identified as a key enabler for research for health, while the key constraint was limited resource mobilization skills resulting in low funding for research. Donor dependence, which responds to donor research interest and issues of global interest, as opposed to local evidence needs, was cited as a challenge.

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[3]   Calculated from 23 countries which filled in the relevant section. For countries which filled in at least three sources and left the other spaces blank, a value of 6 was ascribed to the blank attributes.

4. Individual Country Score

This section presents individual country scores grouped in economic groups as per the World Bank categorization.

4.1 HIGH-INCOME AND UPPER-MIDDLE-INCOME COUNTRIES

A total of nine countries are classified as high- and upper-middle-income countries as shown in Table 4. Out of the nine countries in this group, four showed improvements, while two, Angola and Botswana, which did not submit all their budget allocation requirements in the data tool, showed a downward trend. Botswana, had only two technical and support staff for research, and only one university conducting health research. Algeria and Equatorial Guinea failed to provide the NHS data altogether for this category. The scores are very low for some countries (Gabon, Namibia and Seychelles), indicating very weak NHRS in these countries despite their level of income.

Table 4   Countries' national research for health system barometer scores by economic group

Country	Score	
	2014	2018
Group 1: High-income and upper-middle-income (n= 9)		
Algeria	59	-
Angola	47	46
Botswana	55	44**
Equatorial Guinea	13	-
Gabon	19	32
Mauritius	19	44**
Namibia	24	26
Seychelles	18	25
South Africa	79	89*

*-EDCTP countries with 2018 budgetary requirements submitted   **-non-EDCTP countries with 2018 budgetary requirements submitted

4.2 LOWER-MIDDLE-INCOME COUNTRIES

Thirteen countries were categorized in this band as shown in Table 5. In this category, nine out of 13 countries showed significant improvements, with the highest recorded for Cameroon, Kenya and Congo. Cameroon's improvements were bound to happen, as significant budgetary allocations had been made to health research, and the country had a fair number of universities (six) conducting health research, and technical and support staff in health research programmes. Kenya's technical and support staff in health research (1365) and universities conducting health research (12) contributed to the double increase in its overall index.

Cabo Verde, Mauritania and Eswatini, on the other hand, showed a decline in their overall performance indices. For Cabo Verde, staff in health research and universities conducting health research were lacking, while budgetary allocations for health research was limited. Eswatini for its part, had submitted an incomplete tool, with sections 1, 2 and 3 missing. Budgetary allocations for research was also lacking. Mauritania's problem was no different, as it also lacked technical and support staff in health research and had no budget allocations for health research.

Table 5   Countries' national research for health system barometer scores by economic group

Country	Score	
	2014	**2018**
Group 2: Lower-middle-income (n= 13)		
Cameroon	36	95*
Cabo Verde	50	25
Congo	24	57
Côte d'Ivoire	36	44
Ghana	48	66*
Kenya	42	85**
Lesotho	47	64**
Mauritania	30	25
Nigeria	42	58*
Sao Tome and Principe	6	-
Senegal	71	71*
Eswatini	54	38
Zambia	65	86*

*-EDCTP countries with 2018 budgetary requirements submitted   **-non-EDCTP countries with 2018 budgetary requirements submitted

4.3 LOW-INCOME COUNTRIES

Out of the 25 countries in this category (see Table 6), 15 showed significant improvements on their index, with the highest movers being Malawi, Mozambique, Liberia, Mali and Niger. For Liberia, Malawi and Mozambique the improvements had to with universities conducting health

research, and technical expertise, while for Mali and Niger, budgetary allocations contributed more to their improved indexes.

Five countries, Benin, Democratic Republic of the Congo, Madagascar, Uganda and Zimbabwe showed some decline in performance. Lack of full budgetary allocations data for Benin, Democratic Republic of the Congo and Zimbabwe were the main reasons for the drop in the indexes, while lack of technical personnel to support health research and low budgetary allocation to health research were some of the reasons for the index decline for Madagascar.

Table 6   Countries' national research for health system barometer scores by economic group

Country	Score	
	2014	2018
Group 3: Low income (n=25)		
Burkina Faso	65	77*
Burundi	35	38
Benin	54	51
Chad	12	-
Central African Republic	30	-
Comoros	18	-
Democratic Republic of the Congo	35	33**
Eritrea	42	44
Ethiopia	65	67*
The Gambia	43	57*
Guinea	53	-
Guinea-Bissau	30	50
Liberia	36	82**
Madagascar	42	39**
Malawi	48	70**
Mali	59	85*
Mozambique	30	70*
Niger	65	84*
Rwanda	81	83**
Sierra Leone	18	26
South Sudan	12	44
Tanzania	77	86*
Togo	18	
Uganda	72	70*
Zimbabwe	65	64**

*-EDCTP countries with 2018 budgetary requirements submitted   **-non-EDCTP countries with 2018 budgetary requirements submitted

5. Action Required at the Country and international Levels

Respondents identified actions required at the country and international levels and country responses were grouped into five categories: partnerships and collaboration; skills and experience; infrastructure; funding and the role of government; and policy-makers, which mirror the findings. Details are shown in Annex 2.

5.1 PARTNERSHIPS AND COLLABORATION

- Strengthening linkages with local universities and improving interinstitutional collaboration in research.

- Promoting public-private partnerships and southern-led research programmes. This implies designing locally contextualized research programmes that are attractive to local industry and that resolve current health challenges.

- At the international level, strengthening collaboration between directorates of health research and international research institutions can help align national research priorities with those of international players.

5.2 SKILLS AND EXPERIENCE

- Building technical expertise, strengthening health research directorates and building the capacities of local researchers to draft competitive bids.

- At the international level, providing assistance for training staff in specific fields in line with skills gaps, as requested by respondents.

- Sourcing technical support from other Member States.

5.3 INFRASTRUCTURE

- Assistance in building research infrastructure and providing key enablers such as internet connectivity.

- Provision of equipment and vehicles as part of the incentive structure for researchers. At the international level, what was sought was assistance in building state-of-the-art infrastructure and competency in state-of-the-art techniques.

5.4 FUNDING

- Scale up domestic funding for research. This may include researchers lobbying policy-makers. National governments need to come up with innovative funding mechanisms that can sustainably fund R4H.

- Establish a specific health research fund, which could be ring-fenced for research for health.

- Provide funding support for national research proposals, conduct research and scholarships for building research capacity in key fields so that the dual risk of brain drain and retirement of senior researchers could be mitigated.

5.5 ROLE OF GOVERNMENT AND POLICY-MAKERS

- Strengthen governance for research through legislation and development of strategic documents.

- Strengthen governance structures and harmonize fragmented research guidelines and legislation across various government institutions.

- Bridge the gap between research findings and policy-making through improved uptake of research evidence.

- At the international level, urge international partners to support health research priorities, as identified by African partners.

- Government should show commitment and political will, and introduce sound legal, governance and regulatory frameworks to create a conducive environment for knowledge generation and exchange.

6. Conclusion

The results of this survey show a great improvement in the strengthening of NHRS in WHO AFR Member States. While the scores show improved performance overall, some countries are still way behind, and need to identify the key country-specific gaps and address them. An African NHRS barometer is a critical tool that helps countries to identify gaps in NHRS and institute key interventions to address them. The NHRS scores for the individual sub-functions are key to guiding policy-makers to locate resource design and develop interventions to address them. However, the journey towards UHC is long and calls for the generation of local and contextualized solutions, hence the urgent need to pay attention to strengthening NHRS.

Countries with weaker NHRS can draw lessons from those with a robust research infrastructure, which highlight key enablers, such as a functional organizational structure, good leadership and appropriate staffing in the Ministry of Health. It was also noted that key skills that were enablers for research for health include multidisciplinary experienced teams, young medical and biomedical professionals keen on boosting research, and the motivation of quality research outputs of high impact on society and policy. Functional infrastructure, including laboratories and equipment, were also identified as key enablers for research, as were collaboration and partnerships with local and international health research institutions. As trust is a key element in partnerships, it takes a long time to develop networks and linkages. Resolving coordination and collaboration challenges and avoiding a silo approach for research centres within a country or a particular institution can help countries strengthen their NHRS and bear fruit in terms of better health services for the citizens.

Domestic financing will be crucial to realizing sustainable progress in strengthening NHRS as well as responding to local evidence gaps. A case has been made for exploring innovative mechanisms by governments as well as the role of private entities in funding local research. Funding from international sources definitely will continue to play a role in the short to medium term but strong governance to ensure coordinated efforts and alignment to country priorities will be key to attaining maximum return on investment.

Annex 1: Enabling and constraining factors for health research

	Leadership and administration	Skills and experience	Infrastructure and partnerships	Funding	Role of government and policy-makers
Enabling factors	• Functional organizational structures • Good leadership, presence of structure and staffing at MoH	• Multidisciplinary experienced teams • Younger generation of medical professionals, keen on boosting research • Quality of research outputs which builds trust from partners.	• Infrastructure development • Global partnerships • Functional infrastructure • Functional equipment • Partnerships with other universities • Support from development partners • Trusted by development partners • Partnerships guided by MoUs and established research consortiums • Collaboration with local and international health research institutions.	• Government support	• Government commitment • Political stability • Good legal, governance and regulatory frameworks in general • Good political will • Political commitment from the Minister of Health • Availability of the national health research agenda • Policy-makers and decision-makers on same wavelength as institutions, regarding the way forward • Government support, supervision and monitoring
Constraining factors	• Lack of proper systems • Lack of coordination • Inadequate motivation mechanisms for staff • Lengthy administrative formalities • Data protection issues pose delays and cause significant constraints in getting research projects off the ground • Lack of coordination mechanisms for research.	• Some staff unmotivated • Competing interests between conducting research & teaching • Limited clinical research • Weak capacity in research proposal development and implementation • Low capacity for research • Lack of qualified and experienced researchers • Lack of capacity to train researchers • Retirement of competent senior research scientists coupled with slow replacement with young enthusiastic research scientists. • Brain drain.	• Lack of coordination and collaboration • Research centres work in silos • Laboratory infrastructure and reagents • Insufficient research infrastructure	• Limited skills in resource mobilization to support the research agenda. • Low funding • Dependency on external funding for research • Insufficient funding • Over-dependency on donor-funded projects • Changing of global health research funding landscape • Difficulties in getting funding support • Inadequate and irregular funding.	• Research institutions not owned by government • Difficulties in getting technical support • Absence of well-coordinated institutional health agenda-setting mechanism • Few nationally and institutionally initiated and funded health research studies • No innovative commercialization mechanisms in place for health research outputs.

Annex 2: Actions needed to strengthen health research capacity

	Partnerships and collaboration	Skills and experience	Infrastructure	Funding	Role of government and policy-makers
Action at country level	• Strengthen linkages with local universities • Improve interinstitutional collaboration in research • Promote public-private partnership in Research for Health • Promote southern-led and southern-funded research collaboration/partnerships • Design research programmes that are attractive to industry and their shareholders, and which play a role in resolving identified health problems.	• Building personnel and technical expertise • Strengthening the Health Research Directorate • Building capacity of researchers to write competitive proposals and attract funding to strengthen researchers in scientific writing • Increasing domestic funding for research, stimulating and scaling up the need for research by engaging and lobbying political actors and key decision-makers	• Assist in building research infrastructure • Provide internet connectivity for the directorate • Provide additional vehicles to technical staff to ease mobility challenges • Provide incentives for health research staff.	• Establish a health research fund to facilitate implementation • Allocate research funds for selected priority research topics • Advocate for fund allocation for research purposes and mobilize research • Health Ministry should allocate 5% of national health budget to health research, in line with Algiers Declaration • Set aside meaningful funding for health research (at least 1% of GDP should be committed to research)	• Facilitate approval of research bill. It carries more than 65% of the solutions to the challenges in health research • Harmonize research, bring together fragmented research guidelines across government institutions • Help ministry in establishing a research centre • Update national health research policy and strategic plan • Strengthen research governance • Bridge the gap between findings and policy • Demonstrate the political will to commit funding for research for health.
Action at international level	• Strengthen collaboration between directorate of health research and international research institutions • International health researchers should align with national research priorities • International networking on health research.	• Assist countries in training staff in, for example, epidemiology, statistics and demography research • Technical support from EDCTP Member States in specific areas, such as development of capabilities in social sciences, statistics and data management.	• Assist with building state-of-the-art research institutions and sourcing state-of-the-art equipment in Africa • Train staff in techniques in state-of-the-art laboratories in Africa.	• Provide funding support to national research proposals • Provide financial support to conduct research • Provide financial support for scholarships	• Engage in international and global advocacy • Create joint regional and international research capacities • Advocate for active utilization of research evidence and recommendations generated by health research • Support priority health research in countries and in Africa.