Strengthening Health Research Systems in Africa: A Regional Analysis

Deliverable 2 – Final report

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Abbreviations and acronyms

AAS – African Academy of Sciences

AfDB - African Development Bank

Africa CDC – Africa Centres for Disease Control

ARIPO - African Regional Intellectual Property Organization

AU – African Union

AUDA – African Union Development Agency

CAMES - Conseil Africain et Malgache pour l'Enseignement Supérieur

CEEAC - Economic Community of Central African States

ECSAHC - East, Central, and Southern Africa Health Community

ECOWAS – Economic Community of West Africa States

HSR - health sciences research

IGAD - Intergovernmental Authority on Development

IP – intellectual property

IUCEA - Inter-University Council for East Africa

NPHI – National Public Health Institute

OCEAC - Organisation de Coordination pour la lutte contre les Épidémies en Afrique Centrale

SRO-EA/UNECA – Subregional Office for Eastern Africa, United Nations Economics Commission for Africa

STI – science, technology, and innovation

WAHO – West African Health Organisation

WHO AFRO – World Health Organization Regional Office for Africa

WHO EMRO - World Health Organization Regional Office for the Eastern Mediterranean

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INTRODUCTION

The Wellcome-commissioned project "Building the case for investment in health sciences research in Africa" conducted by LSE investigated barriers and facilitators to improving health sciences research (HSR) in a set of African countries across all sub-regions (with HSR taken to include a range of activities from basic and clinical science to public health research or applied health policy and systems research) (Jones et al., 2021). In that project, national stakeholders reported regional organisations as having increasing significance within the HSR landscape and considered regional organisations as integral and influential stakeholders for strengthening HSR within and between countries in Africa. National stakeholders saw opportunities for using existing regional organisations and their networks to both raise the profile of HSR and to strengthen national health research systems through collective action. The findings provided justification for further work exploring how regional organisations are positioning and impacting the continent's HSR capacity and landscape. This report presents results from a follow-on study, "Strengthening health sciences research in Africa – a regional analysis."

There have been dynamic institutional changes at the continental level in this arena in recent years, such as the evolution of the African Academy of Sciences into a financing platform for science in 2015, the launch of Africa CDC in 2017, and the transformation of the New Partnership for Africa's Development Planning and Coordinating Agency (NEPAD Agency) into the African Union Development Agency in 2019. Regional organisations have demonstrated interest in health research systems via policies and strategies adopted by member states, such as WHO AFRO's *Research for Health: a strategy for the African region 2016-2025* and the African Union Development Agency's *Health Research and Innovation Strategy for Africa 2018-2030* (African Union Agency for Development, 2019; World Health Organization Regional Office for Africa, 2015)*.* Despite these signposts of strategic interest and activity, the roles of these regional organisations in HSR have not been extensively documented and analysed.

This may be particularly important, as social science research has shown critical roles that regional cooperation can play in health policy and multi-level governance in regions of the global south (Riggirozzi & Yeates, 2015). In West Africa, for instance, an evaluation of a joint project by the Commission on Health Research for Development (COHRED) and the West African Health Organisation (WAHO) in four West African states concluded that long-term support from a regional organisation is necessary to strengthen national health research systems, particularly in fragile states (Sombié, Aidam, et al., 2017a). This is a rare example, however, of such analysis at the regional level in Africa.

A final reason to explore the role of regional organisations is because they may illuminate opportunities for more equitable growth and improvement of HSR between countries in Africa. Our previous research on national health research systems found that countries which showed higher performance on metrics such as publications and trials, as well as greater human and institutional capacity, have generally benefited from substantial, long-term international partnerships and collaborations (often with Northern institutions) which, when institutionalised, have helped to develop islands of health research activity (Jones et al., 2021). Over time, many of these have grown stronger, producing high calibre outputs, implementing research

management and governance systems, attracting more collaboration, and expanding networks. Yet this model also risks generating inequalities and pockets of excellence instead, rather than broader or more evenly distributed improvements. Regional organisations could, in theory, support a more coordinated approach to strengthening health science research that accounted for reducing differences in states' capacity within the region whether through regional financing schemes, building regional centres of excellence, or promoting knowledge and technology transfer between African countries. This project aims to contribute to advancing knowledge on regional organisations' activities to support HSR in Africa and to develop a case for strengthening HSR that includes a regionalism as a critical scale for action in this account.

Background

The literature on regionalism and health in the global south identifies a few key issues for the study of the involvement of regional organisations in strengthening HSR in Africa. First, there is not a clear definition of a regional organisation. Regional organisations involved in health are structured and governed in a variety of ways: across an entire continent (e.g. African Union, Union of South American Nations), in sub-regions within a continent (e.g. Economic Community of West African States), or within shared physical environments (e.g. Lake Victoria Region Local Authorities Cooperation). However, regional cooperation on health is not reserved to the domain of state or public actors. The literature on regionalism and health in the global south highlights an important role of civil society organisations, professional organisations, and NGOs at the regional level to regional work on health and health research, mainly through partnerships, networks, and advocacy coalitions (Aidam & Sombié, 2016, p. 4; Chauvin, 2008; Chaves, 2012, p. 15; Godsäter, 2013).

Second, regional organisations work in different ways within the institutional landscape of health governance more globally, at the interface of the global arena and the national/local arena (Kickbusch & Szabo, 2014). Regional organisations constitute key policy venues with potential to mobilise collective and to convene state actors around shared issues and challenges. For example, the way education and health were defined as social policy problems in the Common Market of the South (MERCOSUR) influenced the types of institutional mechanisms and policy instruments available for regional cooperation in those policy domains (Bianculli, 2018). In some instances, regional organisations serve as an intermediary within a top-down approach to governance and adapters of global standards, norms, and practices – (Fidler, 2010; Lamy & Phua, 2012, p. 236). In others, they act as a convenor of local or national expertise and interests to coordinate and advocate a bottom-up approach to health and rights (Akami, 2016, p. 15; Faria, 2015; Herrero & Tussie, 2015; Wenham, 2018). These are not mutually exclusive, and organisational behaviours and strategies may shift in response to internal or external factors. In both modalities, the proximity of regional organisations to a broad range of national stakeholders is an asset. This literature highlights that it is important to consider the larger networks that regional organisations belong to as context for understanding their activities and roles in health and HSR.

Experiences from Africa are reasonably well-represented in the scientific literature on the role of regional organisations in health research systems, with a particularly strong representation of West Africa in particular (See: (Aidam & Sombié, 2016; Alemnji et al., 2017; Ezeh et al., 2010; Godsäter, 2015; Mandil et al., 2017; Nwaka et al., 2010, 2012; Sombié et al., 2013;

Sombié, Aidam, et al., 2017b; Sombié, Bouwayé, et al., 2017; Thompson et al., 2013; Varkevisser et al., 2001). WAHO authors, for instance, have identified three important challenges for regional organisations in their work to promote HSR: the bureaucratic nature of regional organisations impeding internal coordination; coordination of complex collaborations; and the need to advocate for member states to prioritise and commit to HSR (Sombie et al., 2018, pp. 9, 10).

Other existing literature has emphasised the role of partnerships with national research institutions, international NGOs, development partners, and funding agencies as critical to the success of regional organisations' work to strengthen HSR (Aidam & Sombié, 2016, p. 4; Chauvin, 2008; Mandil et al., 2017). Analyses of capacity strengthening initiatives has further demonstrated that regional cooperation can be particularly effective to develop research culture in low-performing countries when it supports networking between individuals in those states with more experienced regional partners (Thompson et al., 2013; Varkevisser et al., 2001). Finally, regional collaboration has been seen to be a useful approach to reduce inequalities in research capacity between countries and different performance of national health research systems. For example, the development of regional research infrastructure (e.g. regional laboratory) can bring efficiency gains to countries with little or no national research infrastructure (Alemnji et al., 2017).

Conceptual approach

While existing literature has provided some insights or examples of regional bodies influencing HSR, this study attempts to explore this in greater detail considering the multiple key elements typically held to be central to HSR capacity at a national level. To do this we utilise the four key pillars of health research systems defined by Pang and colleagues of: governance, creating and sustaining resouces, producing and using research, and financing (Pang et al., 2003). These pillars and their sub-elements can be seen in **Figure 1**. The pillars provide a comparable way for both national and regional stakeholders to see and consider how regional cooperation may contribute to the strengthening HSR in countries.

The pillars have been widely adopted and used to guide the thinking and evaluation of the functions of health research systems by international organisations and scholars (See: Hanney, Kanya, Pokhrel, Jones, & Boaz, 2020; Kennedy & IJsselmuiden, 2006). Indeed, the WHO Regional Office for Africa has been regularly assessing and monitoring the development and progress on these essential pillars and to structure the targets in its regional strategy for health research in Africa (Kirigia et al., 2015, 2016; Kirigia & Wambebe, 2006; Rusakaniko et al., 2019; World Health Organization Regional Office for Africa, 2015).

Existing literature already presents some indication that regional organisations may be carrying out a range of activities related to these core pillars of HSR (Pang et al., 2003, p. 817): to improve *governance* of HSR at the national level, such as the development of research priorities or the creation of ethics committees (Sombié, Aidam, et al., 2017a); to strengthen human *resources* and infrastructures for HSR through training, network building, and laboratory development (Aidam & Sombié, 2016, p. 5; Alemnji et al., 2017; Sombié et al., 2013, p. 9); to increase the *production and use* of research, including dissemination and evidence-based policy support (Aidam & Sombié, 2016, p. 7; Sombie et al., 2018, pp. 9, 10; Sombié et al., 2013, p. 8; Sombié, Bouwayé, et al., 2017, p. 10); and for *financing* HSR (Aidam & Sombié, 2016, p. 6; Nwaka et al., 2010, 2012).

Pillars for Strengthening Health Research Systems

Pillar 1: STRENGTHENING GOVERNANCE OF HEALTH SCIENCES RESEARCH

- Legal framework for HSR, including formal agreements and treaties.
- Health research regulation, including the institutional structures, intellectual property, and regulation that guide HSR.
- Science, technology, innovation and development policies and priorities relevant to HSR, including a broad range of policies that are related to HSR such as STI, education, and environment.
- Health research policies and priorities.
- Ethics committees and Institutional Review Board initiatives, networks, and standards.
- HSR governance, norms and guidelines, including strategies, initiatives or position papers on the governance of health research.

Pillar 2: CREATING & SUSTAINING RESOURCES FOR HEALTH SCIENCES RESEARCH

- Health research institutions, universities, collaborations, and national research centres.
- Centres of Excellence (for HSR) founding documents, regulation, and evaluation.
- National Laboratories.

Pillar 3: PRODUCING & USING HEALTH SCIENCES RESEARCH

- Knowledge translation platforms, funding, regulation, and evaluation.
- Health research coordination (institutions and mechanisms).

Pillar 4: FINANCING HEALTH SCIENCES RESEARCH

- Regional health research funds (or contributions to national funding schemes for HSR).

Figure 1. Pillars for Strengthening Health Research Systems (adapted from Pang et al. 2003 & Kirigia et al. 2015)

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We thus utilise these pillars as the framework for our analysis of regional organisations' involvement HSR in Africa to structure our findings about their activities, impact, and aspirations in this domain. The pillars provide a comparable and established way for both national and regional stakeholders to see and consider how regional cooperation may contribute to the strengthening HSR in countries.

METHODS

To explore and examine the role of regional organisations in these ways, between October and December 2020 we carried out a stakeholder mapping of regional bodies across Africa involved in HSR, followed by interviews with key informants from a selected sample of 15 institutions, conducted between January and April 2021. We define regional organisations as those comprised of at least three member states that have been established as formal or legal entities of regional cooperation through an internationally recognised instrument. The mandates of regional organisations may cover political, technical, and/or economic cooperation.

Table 1. Types of Regional Organisations

Regional Organisations by Types of Mandate	
Economic:	Organisations with the principal mandate to improve the economic situation of African States, such as trade organisations and economic cooperation groups.
Political:	Organisations with mandates to regulating and negotiating political relationships between nations within Africa, such as multilateral organisations and other normative institutions.
Technical (Development):	Organisations mandated to provide technical expertise, support, and/or coordination of development activities or policy.
Technical (Education)	Organisations mandated to provide technical expertise, support, and/or coordination of higher education activities or policy more broadly.
Technical (Health):	Organisations mandated to provide technical expertise, support, and/or coordination of health activities or policy.
Technical (Science):	Organisations mandated to provide technical expertise, support, and/or coordination of science activities or policy more broadly.

We employ the term "regional" broadly to include organisations with membership regrouping states in any of the five regions of the African continent, organisations with membership that spans more than one region in Africa or language groups, and organisations that cover Sub-Saharan Africa only or the entire African continent. Working definitions of each type of organisation are found in **Table 1**. We used this membership-based definition of regional organisations to emphasise organisations of member states and to distinguish them from regional research networks and consortia. This was important because regional organisations have direct access to and interaction with governments, and thus may be a mechanism to influence policy and regulatory change for HSR. This is in comparison to research networks

and consortia, which are more likely to build relationships between individual researchers or labs, research institutions, research funders, and practitioners or non-governmental organisations.

Stakeholder mapping

The stakeholder mapping aimed to identify which regional bodies were active in one or more key aspects of HSR development in the continent. We began the mapping exercise with a list of key regional stakeholders identified in previous research on HSR and national health research systems policy. We also canvassed the personal opinion and knowledge of members of key expert networks active on the continent to identify additional organisations or ensure we were not missing any well-established organisations. From this preliminary list, the study team reviewed governing, strategic, and policy documents to identify HSR-related partners of institutions already identified, which were then added to the stakeholder map if they met the defined eligibility criteria (see **Box 1**). Documents from newly identified organisations were then searched, and the process continued until no new organisations were identified. In the end, we collected data on a total of 67 organisations, 49 of which met the eligibility criteria to be included in the stakeholder map (see **Appendix 1** for full list).

Box 1. Selection Criteria for Regional Organisations in the Stakeholder Map

Inclusion:	Exclusion:
1. Regional organisation, defined as a public or private institution with membership or sponsorship from three or more African countries or territories.	1. Private institutions without government sponsorship or state membership, such as private research organisations.
2. Mission statement broadly related to strengthening governance of HSR, creating and sustaining resources for HSR, producing and using HSR, OR financing HSR.	2. Organisations that are extensively governed by members or countries outside the African continent.

For each regional organisation in the preliminary stakeholder map, we then collected the following information: organisation name, sub-organisation, headquarters location, geographic sub-region of the organisations mandated activities (according to the five geographic sub-regions of the African Union), countries included and/or member states, brief description of the organisation's role in supporting HSR, website, HSR specific link (e.g. to a program, project, policy). Finally, we conducted a manual search of the websites for each included organisation and further searched for documents that could provide more detail on their level of activity or impact in any of the four key pillars for strengthening HSR. We retrieved a total of 51 documents from 20 organisations. Each document was classified as either Policy (n=9), Strategic Plan (n=25), Report (n=14), or Governing document (n=2).

To analyse data from the mapping exercise, we applied the four main pillars (see **Table 1**) of national health research systems to assess which areas of HSR regional organisations have evidence of involvement or declared goals or intentions.

Key informant interviews

Once the mapping exercise was completed, we conducted interviews with a sub-set of regional bodies to investigate in greater depth the activities, impact, and potential of these bodies in relation to HSR development within countries. The interview sample was selected to ensure a wide range of experiences: languages, geographic areas covered, and organisational types (economic, political, or technical orientation). The list of priority organisations included can be found in **Appendix 2**. Ethical approval was received from the LSE Research Ethics Committee to remotely conduct interviews for this project (REC ref # 757b), and the information and consent materials for participants were prepared in English and French languages.

As part of the stakeholder mapping exercise, we classified organisations according to whether they had evidenced (explicit), declared (implicit), or expected (but unseen in available documentation) interest in HSR, according to the documents available online. Thus, we could prioritise organisations to approach for interview if they had evidenced or declared interest based on materials identified in the mapping.

In total 18 interviews (13 in English, 5 in French) were conducted with informants from 15 regional organisations in the first quarter of 2021. Half of the informants were in senior technical or operational positions, and half were in executive and strategic positions. The interview guide was designed to collect data on the roles, potential, challenges, and opportunities of these bodies in strengthening HSR across the continent, within and between countries and can be found in **Appendix 3**.

The interview data was coded and analysed with the *Dedoose* qualitative data analysis software. We thematically coded the interview data according to the key pillars for HSR (i.e. governance, infrastructure and resources, knowledge generation and use, and financing,) regional organisations are working in; how they are carrying out this work (i.e. advocacy, collaboration, coordination); and in which pillars they perceive they are having impact (see **Appendix 4** for code book). Looking across all of the organisations, we considered: the comparative advantages different organisations have; the gaps in current activities; and the most common themes of barriers and facilitators for regional organisations working to support HSR in Africa.

RESULTS

Stakeholder mapping: Regional organisations in HSR in Africa

The results of the stakeholder mapping exercise (including analysis of available policy documents) help to draw a picture of the overall landscape of regional organisations and their roles in strengthening HSR in Africa. The preliminary results of the stakeholder map include 49 organisations and sub-organisations, across three types of regional organisations (economic, political, and technical). **Figure 2** shows the distribution of the stakeholders in the mapping across these categories, with further sub-categories for domains of expertise for the technical organisations. The sum of organisations across all types is higher than the number of stakeholders on the map, because some organisations have more than one kind of mandate.
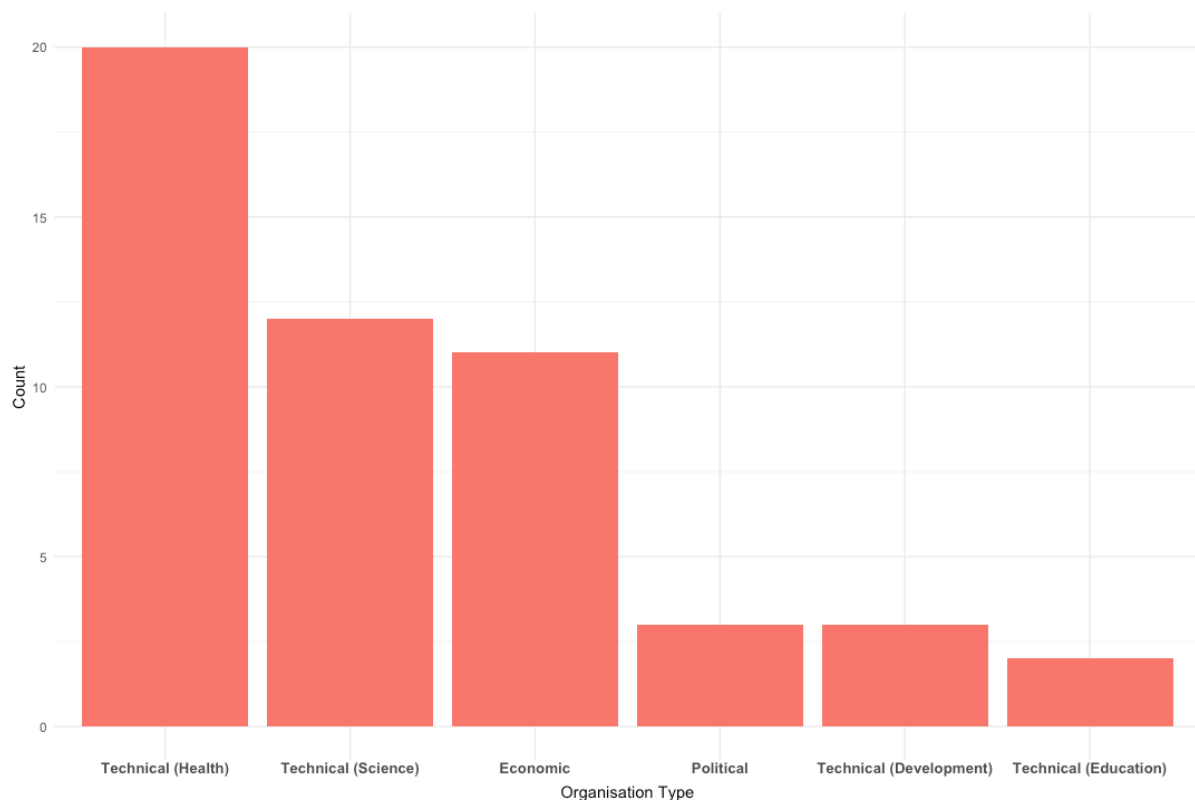

Figure 2. Mapped Regional Organisations by Expertise

An analysis of regional organisation membership by member states shows that sub-regional hubs and networks are particularly strong in East and West Africa, in comparison to other sub-regions. **Figure 3** shows the number of regional organisations on the stakeholder map to which individual African states are members. This visual representation of regional hubs suggests that tight networks of regional organisations may correlate with regional HSR collaborations and related networks.
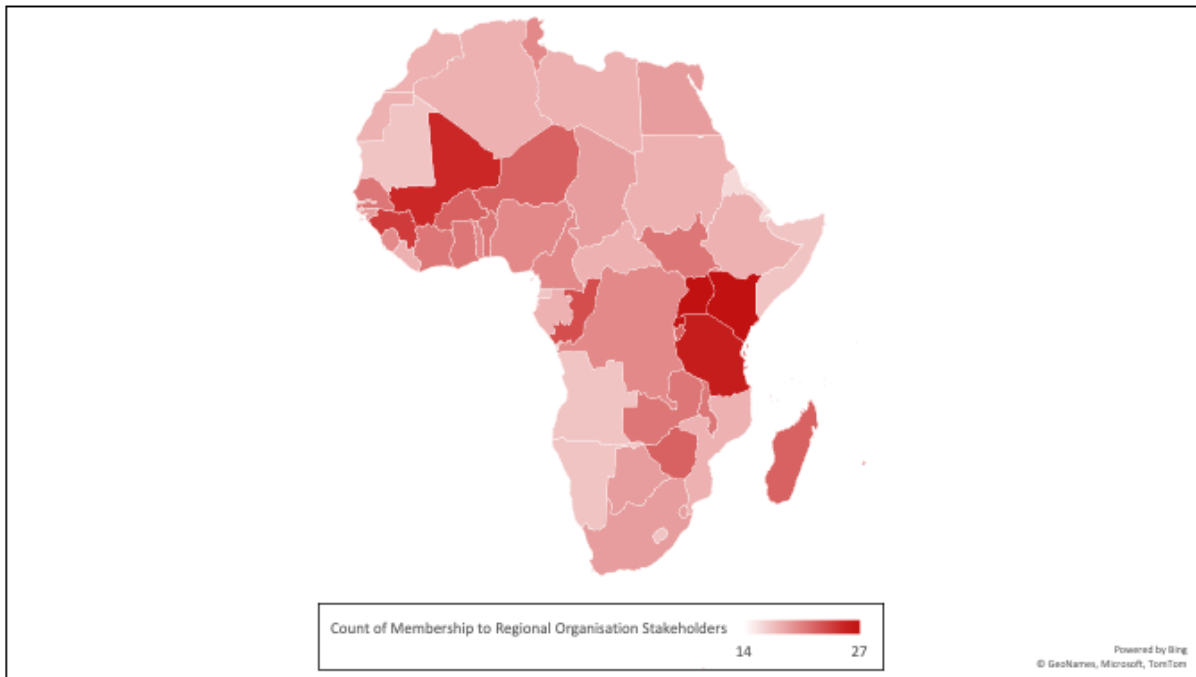
Figure 3. Count of State Membership to Regional Organisations and Sub-Organisations

A large majority of the HSR relevant policies and strategies we collected online were published since 2015. From the analysis of the evidenced action or self-declared interest in HSR in data from content of organisations' websites, we find that a large proportion of regional organisations' interests in strengthening HSR lies within governance, and least within financing (see **Figure 4**). When these findings are broken down within each pillar, we observe science, technology, and innovation (STI) and health research policies are the main focus of the governance pillar, while none of the policy documents appear to address research ethics for example (see **Figure 5**). With the exception of documented interest in health research coordination, the issues within the three other pillars seem to be addressed with comparatively similar attention within strategic plans and policies. However, these are aggregate themes across all of the documents, and in some instances, organisations had multiple documents, thus we could expect that this picture may look differently if the interests in pillars were broken down interests of different types of regional organisations.
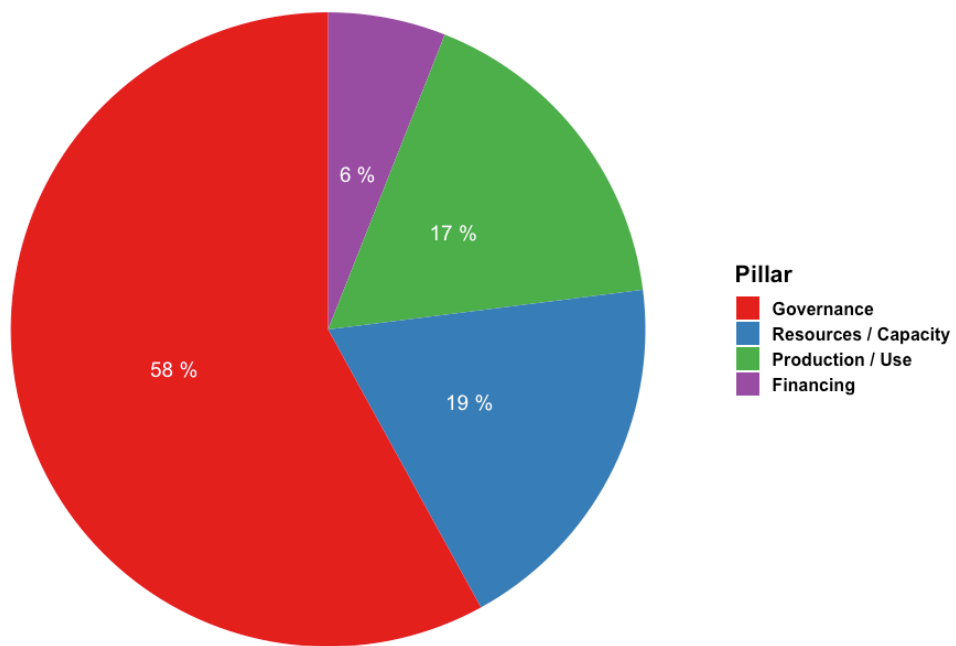
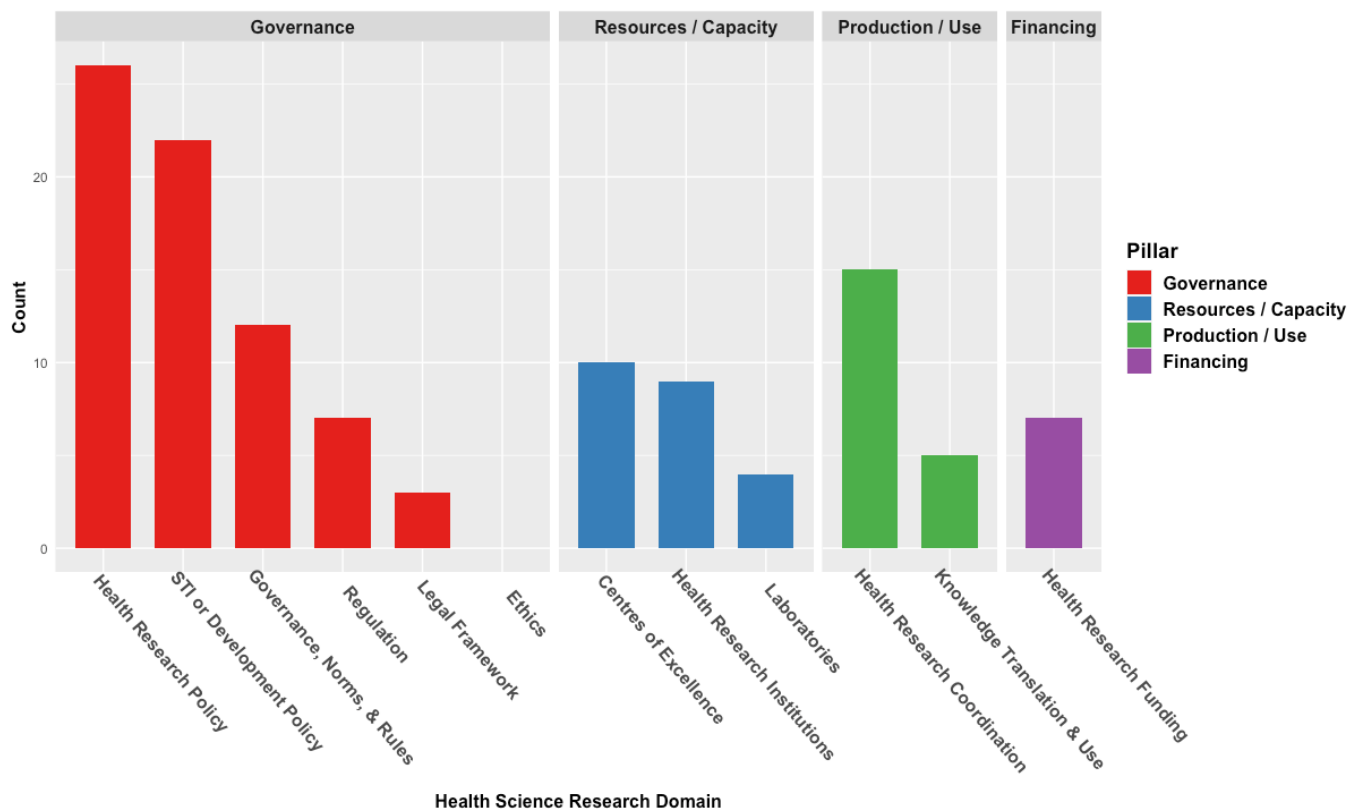**Figure 4.** Regional Organisation Involvement by Pillar

Figure 5. Regional Organisations' Stated Interest in HSR by Domains within Pillars

Interview results: Regional organisations' roles in strengthening HSR

In this section we present our findings on the different roles regional organisations were found to play in HSR in Africa, structured around the four key pillars of HSR strengthening (see **Figure 1**), based on interviews conducted with 15 organisations (see **Table 2**). Looking individually at each organisation, we found a variety of activities and contributions being reported in HSR, but with some differences according to the type of organisation by areas of expertise or policy focus. **Table 2** provides an overview of the 15 organisations in the study with their involvement in any pillar represented if they discussed doing at least one activity in that area. This is not weighted and does not represent volume or levels of activity; nevertheless, it paints a broad picture of where different organisations' efforts fit into a framework of improving HSR core functions. Most organisations we spoke with stated being active in two or more of the pillars, the most frequent of which were governance and producing and using research. The organisations which reported being active across all four pillars were generally those with specific health expertise, such as Africa CDC, OCEAC, WAHO, WHO AFRO, WHO EMRO as well as CAMES with higher education expertise. The financing of HSR was the pillar with the least amount of reported activity from the organisations in our study.

Looking at each pillar on an aggregate level across all organisations, we also found important differences when we compare regional organisations' reported activities against those where they felt they had achieved impact. **Figure 6**Error! Reference source not found. provides this comparison within each pillar for all 15 organisations in the study combined, with their involvement and impact in any pillar represented. This was most noticeable in the financing pillar, where few regional organisations conveyed that they have had any impact on increasing the funds available for HSR in countries even though many claimed to be active in this area.

In each section below, after overviewing key findings looking at which organisations are involved and in what aspects of the pillar, we then present a gap analysis that compares what respondents stated that regional organisations *should* be doing, and the activities (collectively) which we found these regional organisations have been actually undertaking.
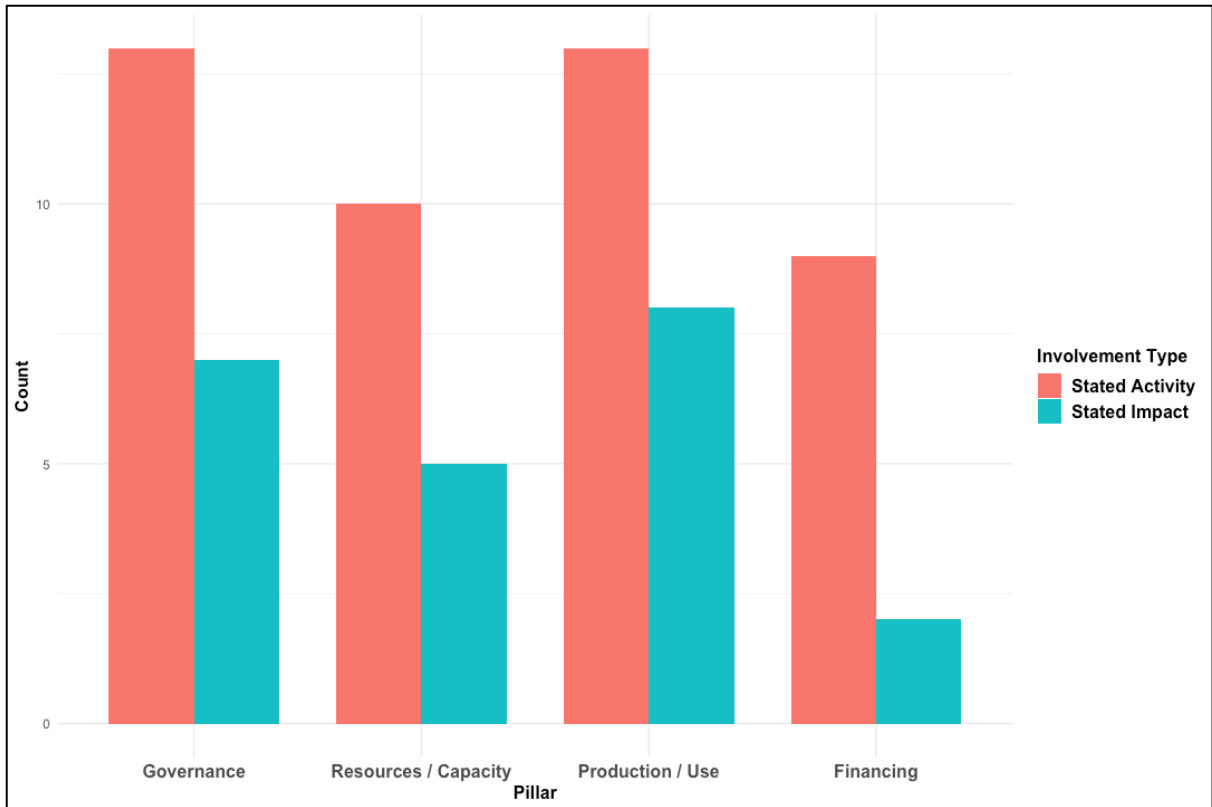
Figure 6. Activities and Impacts in HSR by Pillar for all Regional Organisations

Table 2. Interviewed Organisations

Description of Regional Organisations					Health Science Research System Pillars			
Expertise	Organisation	Year Founded	Organisation Type	Internal Governance	Governance	Resources / Capacity	Production / Use	Financing
Economic	Economic Community of Central African States (**ECCAS**)	1983	Regional Economic Community	Intergovernmental / Member States	■			
Technical (Education)	Conseil Africain et Malgache pour l'Enseignement Supérieur (**CAMES**)	1972	Panafrican Organisation	Intergovernmental / Member States	■	■	■	■
	Inter-University Council for East Africa - East African Community (**IUCEA**)	1980	Regional Economic Community	Hybrid membership (states + universities)	■	■	■	
Technical (Development)	African Development Bank (**AfDB**)	1964	Multinational Financial Organisation	Governing Board	■		■	■
	African Union Development Agency (**AUDA**) (*NEPAD secretariat became NEPAD Agency in 2010; AUDA-NEPAD est. 2019)	2001*	AU Agency	Intergovernmental / Member States	■	■		
	Intergovernmental Authority on Development (**IGAD**)	1986	Regional Development Community	Intergovernmental / Member States	■	■		
	Subregional Office for Eastern Africa, United Nations Economics Commission for Africa (**SRO-EA/UNECA**)	1958	UN Agency	Think Tank	■		■	
Technical (Health)	Africa Centers for Disease Control (**Africa CDC**)	2017	AU Agency	Governing Board	■	■	■	■
	East, Central, and Southern Africa Health Community (**ECSAHC**)	1974	Regional Health Community	Intergovernmental / Member States		■	■	■
	Organisation de Coordination pour la lutte contre les Endémies en Afrique Centrale (**OCEAC**)	1963	Panafrican Organisation	Intergovernmental / Member States	■	■	■	■
	West African Health Organisation (**WAHO**)	1987	Regional Health Community	Intergovernmental / Member States	■	■	■	■
	World Health Organization – Africa Regional Office (**WHO AFRO**)	1965	UN Agency	Regional Committee / Member States	■	■	■	■
	World Health Organization – Eastern Mediterranean Regional Office (**WHO EMRO**)	1949	UN Agency	Regional Committee / Member States	■	■	■	■
Technical (Science	African Academy of Sciences (**AAS**) (*Accelerating Excellence in Science in Africa est. 2015)	1985*	Panafrican Organisation	Non-State Actor / NGO		■	■	■
	African Regional Intellectual Property Organization (**ARIPO**)	1976	Panafrican Organisation	Intergovernmental / Member States	■	■		

Governance of HSR

The governance pillar for HSR refers to the policy and legal frameworks and institutional structures that govern and manage HSR, including ethical governance. Most of the regional and sub-regional organisations we interviewed reported being involved in supporting the governance of HSR in Africa in one or another way – with only AAS and ECSAHC stating they were not. We found the activities carried out by regional organisations that are involved in HSR governance to have included agenda-setting and development of regional health research strategies and policies, the provision of guidance and support for national governance of health research (including research ethics), the harmonisation of policies within regional communities, and the coordination of national health research at the regional level. Overall, these activities seem to focus on regional integration of policies, regulations, priorities, standards, norms linked to HSR. According to informants' own perceived impact of their organisations, their activities in this pillar appeared to have been successful within sub-regions, especially when they are led by bodies with technical expertise, in health or education for example. However, the regional organisations which appeared to have the most influence and leadership in this area across the continent were Africa-CDC and WHO.

Those regional bodies with expertise in health (Africa CDC, WAHO, WHO AFRO, WHO EMRO) particularly reported involvement in the governance of HSR by supporting efforts to strengthen research ethics review in member states. This includes the development and dissemination of guidance on ethical standards of research with human participants and training for members of Institutional Review Boards (IRBs) and National Ethics Committees. For example, capacity building workshops for research ethics review are organised by WHO in partnership with Ministries of Health and universities.

We also found a group of intergovernmental organisations with member states across the continent that are actively trying to set the agenda for member countries to strengthen HSR. Organisations such as AUDA, WHO AFRO, and Africa CDC have developed strategic documents and regional policies in HSR to help establish a shared policy framework for countries to adapt and align their national policies and programmes for strengthening their national health research systems. WHO AFRO has also instituted an internal mechanism to advise the Director General on monitoring the implementation of regional policy on research for health and on all matters related to supporting countries in their development of national health research systems.

The main way that regional organisations are involved in governance of HSR at the national level appears to be through their efforts to support harmonisation of national policies across a group of countries. Governance efforts to harmonise policy focussed particularly on four policy areas: pharmaceutical policy, public health policy, higher education policy, and intellectual property policy.

According to our interviews, policies on medicines and therapeutics are one of the largest regulatory policy domains which regional organisations focus their harmonisation effort on. At the sub-regional level, harmonisation aims to improve inspection and use of high-quality and affordable medicines. For example, OCEAC has developed a common pharmaceutical policy across its 6 member states, and WAHO uses a single medicine registration process for all 15 of its member states. All the sub-regional and continental bodies are working together towards the establishment of the African Medicines Agency by the AU, which will be the continental body responsible for regulatory systems for medicines and medical products in Africa. Many

informants expressed their high expectations for the African Medicines Agency, which has not yet formally established because all member states need to ratify the treaty first. Some regional organisations (like SRO-EA/UNECA and AUDA) are advocating member states for ratification to expedite its operationalisation as a formal regulatory authority for medicine and therapeutics at the continental level. Currently, the African Vaccine Regulatory Forum operates as an informal regulatory platform for cooperation in the oversight of clinical trials (e.g. norms, standards, review), with WHO and AU working on capacity strengthening for that with the regional economic communities.

Some organisations (e.g. WAHO, OCEAC, IGAD, Africa CDC) also stated their activities to harmonise public health policies (e.g. guidelines for tuberculosis, malaria, family planning) and medical practices across their member states. IGAD shared that this is particularly useful to support cross-border health and social initiatives as their region has a high mobility across a number of fragile states due to climate and political crises.

Similarly, regional bodies specialising in higher education (such as CAMES and IUCEA) have reported focusing their involvement in the governance of HSR on policies, guidelines, and standards for academic professional development in universities and evaluation criteria for education quality. For instance, in East Africa the heads of state declared the sub-region a common higher education community in 2017, which supports further efforts to integrate higher education policies and standards within different fields (i.e. medicine, health sciences) across the member states. The IUCEA has since been developing implementation advice and tools to support the adoption of these shared standards which they emphasise will facilitate the mobility of students, researchers, and professors in the sub-region. One of the organisations in our sample specialises in intellectual property rights, laws, and policies. Thus, ARIPO promotes harmonisation of intellectual property rights and laws within member states across multiple subregions. ARIPO mainly is mainly involved in the governance of HSR by providing model templates of intellectual property (IP) policy and advice to universities and research institutions so they have a ready-to-use guide for their own IP policy development for their researchers.

We found that the harmonisation of regulatory policies generally focuses on domains where alignment could be most beneficial for individual countries to work with similar standards, potentially because of the homogeneity of these sectors across contexts and wide agreement on the key issues for harmonisation. For example, the work on pharmaceutical and higher education policies provides several efficiencies and advantages by creating common standards and norms across countries, thereby facilitating evaluation of quality (of drugs and therapeutics or higher education and academic professions) and improving mobility and exchange between countries with the same standards. The work on IP rights and health research ethics benefits from harmonisation in other ways, as it aims to strengthen capacity of regulatory systems for these aspects, by sharing policy guidelines and templates with research and development institutions and by training committee members on best practices for review.

The final type of activity carried out by regional organisations that are involved in HSR governance is the coordination of national health research at the regional level. Africa CDC is a unique technical organisation among those interviewed due to its mandate from the AU and authority to coordinate the health research agenda and integrate research and analysis practices across the continent. Africa CDC also takes a different approach to coordination to

others included in our study, working through its 5 regional collaborating centres that have direct relationships with their corresponding regional economic communities and the respective member states. It advocates for the establishment of national public health institutes (NPHIs) in all African countries, as the institutions with authority to coordinate and define health research priorities at the national level. The strategic vision of Africa CDC is to have a NPHI in every African country to strengthen public health capacity (including research) links directly to its networked multi-level approach to coordination – regional coordination centres coordinating with NPHIs and with Africa CDC headquarters. This contrasts to the coordination apparatus of WHO, the other main technical organisation with a broad health mandate on the continent, with more political features of coordination due to direct relationships with national through Ministries of Health. One advantage of WHO, however, is that the organisation also has a presence in-country, which in theory supports their coordination mandate. However, informants underscored that WHO's comparative advantage as a normative organisation is around technical assistance, guidelines, and evidence support with coordination between countries and other regional bodies not being its core strength.

Gap Analysis - Governance

Multiple informants expressed that being able to coordinate members states within a regional body is a challenge due to diverse expectations and contributions of member states to align with an agreed regional agenda or policy related to HSR. Coordination is often moderated by member states' willingness to participate in a collective exercise for harmonisation, even if it falls within the mandate of the regional organisation. We found that organisations like WAHO and CAMES are involved in supporting networking between research institutions, but this was rare among the regional organisations in our sample. From our interviews, informants perceive the gap in coordination wider when it comes to continental or cross-regional coverage. Few organisations are coordinating across multiple remits of stakeholders. The AUDA mainly coordinates with the regional economic communities, but each of those do not have a health specific organisation. Africa CDC coordinates with NPHIs via its regional centres, and WHO coordinates with Ministries of Health. While these AU and UN agencies often coordinate on specific programmes (e.g. African Vaccine Forum), there is no systematic coordination happening, nor is any agency mandated with responsibility for that across continental agencies. This type of siloed coordination poses a problem in particular when regional bodies may not be liaising with the main institution mandated for governing the national health research system in a country.

Secondly, while there are organisations involved in regional agenda setting for HSR (in health, higher education, and innovation sectors), the processes for setting these agendas vary in terms of input and participation from countries about their needs. Furthermore, informants underlined that more resources need to be mobilised by regional organisations if they want to support the adaptation, uptake and implementation of these agendas and HSR governance improvements (policies, regulation, guidelines) at the country level.

Creating and sustaining resources for HSR

The second pillar of HSR explored was that of creating and sustaining resources for HSR. This pillar includes both human capacity (skills and competencies for HSR human resources) and institutional capacity (universities, public and private research institutions), and research infrastructure. Capacity strengthening for HSR refers to improving and maintaining the human

resources (capacity in terms of a critical mass of highly qualified researchers and research personnel) and the research infrastructure (capacity in terms of the institutions, equipment). We found that organisations with specific mandates in health, higher education, or IP which had activities aiming to improve HSR governance were typically also supporting national HSR capacity strengthening. However, this was not seen for regional bodies with an economic mandate.

One of the most important regional actors funding capacity strengthening was found to be the AAS, with several programmes and competitive grants to support the training and development of individual researchers and networks. Indeed, HSR has been a large part of the operationalisation of the mandate given to this organisation by the AU. However, we found fewer regional organisations to be involved in capacity strengthening for research institutions or infrastructure. Rather, more were involved strengthening human resources or and individual skills for HSR. An imbalance in focus on the development of research capacity of individuals risks neglecting the institutional contexts in which researchers are working. This is a problem for HSR overall, as our previous research has shown that strong and well-resourced universities and research institutions are critical as part of the broader enabling environment for HSR (Jones et al., 2021). Africa CDC, WHO, WAHO and CAMES were identified to be the regional organisations that carry out the most comprehensive range of investment in capacity strengthening by these organisations included: the training of researchers, the networking of institutions working on similar themes in different countries, the equipping of research laboratories, the development of manuals or guidelines on HSR themes, the organisation of workshops and seminars, and the evaluation and accreditation of academics and researchers.

WHO AFRO and Africa CDC particularly stand out as their efforts are complementary, with WHO focusing on capacity strengthening within governments through Ministries of Health and Africa CDC within the public health workforce for HSR within research institutions and NPHIs. WHO AFRO describes itself as one of the few regional organisations focused on developing the national health research system at large in individual countries and working towards building these systems through the regional strategy for health research. Their focus is on the institutional capacity strengthening of Ministries of Health to incorporate health research as an integral part of the overall health sector responsibility and to use research to improve policies, programmes, and interventions. For example, throughout the Covid pandemic, WHO AFRO has also been supporting research capacity in countries by sharing standard research protocols with member states to support rapid and rigorous knowledge generation across the continent. WHO is uniquely positioned to work with Ministries of Health because of the organisations' structure working directly with them through the regional committee, and supported by the WHO national presence in country offices. Furthermore, with the remit to strengthen institutional capacity of national health research systems both of the WHO regional offices covering countries in Africa (AFRO and EMRO) carry out work to strengthen capacity of national research ethics boards and institutional review boards to improve health research governance within countries, through training, skills building, and capacity building workshops in partnership with Ministries of Health and universities. The support of regional organisations in this area has led to the establishment of national and institutional ethics committees in several countries.

Africa CDC was also seen to invest in strengthening HSR institutions, but mainly working with universities and national public health institutes, with a focus on building research infrastructure for health research in countries. Africa CDC is the only organisation in our study

which invests directly in research infrastructure improvements, such as laboratories and lab equipment, across the continent as part of their core mandate. However, organisations at the sub-regional level, such as OCEAC and WAHO, have also set up, often in collaboration with partners, several research laboratories that host researchers from different countries and are training sites for HSR students.

Regional organisations in the education and IP fields were also found to be active in strengthening capacity for institutions in specialist areas related to HSR. For example, IUCEA is working with universities on building capacity for post-graduate supervision. While CAMES, as an accreditation and quality assurance agency, develops guidelines for PhD programmes, researcher performance, and promotion of faculty to help universities evaluate, monitor, and improve their research capacity against standards shared across the member states. ARIPO is filling a particular role that is important for HSR in Africa to raise awareness and strengthen capacity for protecting intellectual property. Our previous research highlighted that many researchers and research institutions are not familiar with the procedures for IP protection and filing for patents. ARIPO provides model templates and trains research institutions on patent applications, a curriculum on building respect for IP rights and rules, and training for police officers and authorities to investigate IP crime.

In terms of efforts focussed on training of individuals, several organisations (e.g. WHO EMRO, WHO AFRO, Africa CDC, WAHO, OCEAC) do this through skills building, training, workshops on a range of topics (e.g. ethics, research methods, scientific writing, policy briefs). Africa CDC and OCEAC are also supporting south-south collaboration and knowledge transfer by twinning universities and labs for mobility of researchers to participate in training exchanges (e.g. epidemiology, lab techniques). WAHO funds thematic networks of researchers across the region working on similar topics of interest (e.g. maternal health, infectious diseases, child health, and clinical trials) and hosts their support through centralised coordination within the organisation.

When it comes to funding programs that can directly strengthen human capacity for individual researchers across the continent, AAS is a unique organisation among those in our sample. Designated by the AU as an advisory and implementation body for its Agenda 2063 (the AU framework for sustainable development) and the Science, Technology and Innovation Strategy for Africa (STISA-2024), AAS carries out several programmes through its Alliance for Accelerating Excellence in Science in Africa platform. Whilst the purpose of these programmes is to promote African excellence in science broadly, as per the AAS mandate, researchers in the health sciences benefit from these frameworks. AAS is mainly funded by external partners to finance the programmes it administers to train researchers and associates, develop research leadership, and support health research networks for Africans to lead, carry out, and use HSR. At the sub-regional level, WAHO also facilitates strengthening capacity through specific funding programmes (e.g. Capacity building fund and Commodities Fund).

Gap analysis – Resources

Research infrastructure (lab equipment, supplies) is critical to the HSR landscape within countries and sub-regions to have the material resources available to conduct analyses. Apart from a couple regional organisations in our study (e.g. Africa-CDC, OCEAC), the majority do not report being involved in or investing in building research infrastructure in member states. While regional organisations for the most part do not fund health research infrastructure improvements in member states, regional centres of excellence in each of the AU sub-regions

have been cited as an opportunity for HSR infrastructure development at the regional level. They could also encourage and routinise HSR infrastructure development as part of any investment in human resources development. Africa CDC is at the forefront of advocacy to member states for the establishment of NPHIs as key institutions and infrastructure for HSR, and according to them, this is the main agenda for HSR infrastructure improvements and other regional organisations should also be supporting these as the best investment for sustainable health security, and the coordination of health research in the country.

Despite all the interventions implemented, the distribution of qualified researchers remains uneven across the continent – with key skills still needing development (i.e. grant writing, scientific writing, and dissemination). In addition, training in leadership could potentially empower researchers and decision-makers in member countries so that there is a critical mass of researchers capable of carrying the vision of research for health, presenting the problems and advocating for solutions relevant to their context.

A final gap in capacity strengthening efforts identified is networking of researchers across the continent. Multi-country teams have been set up by WAHO, AAS, and CAMES but more can be done by regional organisations to facilitate this synergy of intelligence and resources. As one informant emphasised, this is a particularly important role for health-related organisations at the sub-regional level to convene research networks to foster equity in research collaborations and include researchers from countries in their regions without research-active universities and insufficient faculty for research education and training.

Producing and using HSR

The third pillar for strengthening HSR refers to the production (research projects/programmes, publications) and use (dissemination, communication, translation) of knowledge. Like the governance pillar, most of the regional organisations we spoke to stated involvement in research production and knowledge use. However, few organisations were found to be involved in knowledge production itself. Technical organisations in the health field are conducting HSR. Some are doing research in-house (e.g. OCEAC, WAHO), but most are doing research working with partners and consultants. A majority of activity in this pillar related to knowledge dissemination and translation. We found this to be a potential strong comparative advantage for regional organisations, however, who have the convening power, and in some instances the official mandate, to bring together researchers and policy-makers to discuss research uptake. Our previous research at the national level of health research systems found that knowledge translation and use was rarely institutionalised into a permanent national platform, and was primarily carried out through ad-hoc activities.

Regional organisations are playing a role in knowledge dissemination and use in multiple ways. WHO EMRO and WHO AFRO conduct training and capacity building for evidence use for health policy and practice in countries that request it, including the drafting of policy briefs to raise awareness among decision-makers. They also advocate to member states to set up evidence into policy networks as part of their normative role to work with Ministries of Health to strengthen national health research systems. The same regional organisations convene policy forums that bring together researchers, policy makers and sometimes beneficiaries of the results to inform and sensitise them to the use of research results in decision-making. Further mechanisms of WHO to support this are regional scientific journals (e.g. Eastern

Mediterranean Health Journal) and programmes such as the Evidence-Informed Policy Network (EVIPNet).

Dissemination through publications, best practice guidance, and conferences are among the more traditional ways of sharing knowledge that regional organisations (e.g. IGAD, CAMES) are involved in. Some organisations (e.g. SRO-EA/UNECA, Africa CDC, WHO, AfDB) are also knowledge users themselves in addition to supporting activities towards use of health research in member states. For example, the AfDB developed the African Nutrition Accountability Scorecards and mobilized African leaders and leading institutions around the African Leaders for Nutrition (ALN) initiative to influence knowledge generation, policymaking, accountability, and governance in the areas of childhood nutrition and health.

But multi-stakeholder platforms that bring decision makers and researchers together is most influential way that several regional organisations (e.g. WAHO, ECSACH, IUCEA, AAS) reported contributing to knowledge translation and use. The ECSAHC stands out because the organisation sees its primary role as one of knowledge translation, facilitating access of national policy makers to research that responds to their policy challenges, such as through their Best Practices Forum. But the evidence use discussions are also part of their core business with Ministers of Health in the annual meetings. Some organisations (e.g. WAHO, IUCEA) have also used these platforms to support innovation. For example, the Academia Public-Private Partnership Forum is a platform of the IUCEA that brings together universities, government, and private sector to create synergies and relationships between knowledge generation and industry. The organisation developed this platform to make research more relevant to industry and to connect students and researchers to the innovation and commercialisation process.

Many regional organisations have the authority and legitimacy to help facilitate platforms that convene and connect epistemic and policy communities. However, few of them have the mandate or capacity for coordinating or managing such multi-sectoral networks on an operational level unless supported through a more long-term project/program (in contrast to the research network coordination done by WAHO and CAMES for example). Their knowledge translation and dissemination work is reportedly carried out through specific platforms for this purpose, but many informants expressed that this is supplemented by advocacy for research use to government policy-makers that they conduct within their respective regular governance meetings (e.g. regional committee meetings, annual ministerial meetings, steering committees, technical working groups). This ongoing advocacy is seen as fundamental from the perspective of regional organisations because multiple informants highlighted that the lack of understanding, prioritisation, and value of research by decision-makers is one of the major barriers to research use they encounter.

Gap analysis – Production and use

The regional organisations included in our study do not really have the mandate to produce knowledge, with the exception of a few such as OCEAC, which has a research laboratory and conducts research in field of HIV/AIDS and malaria. The majority generate data on specific themes via partnerships with universities or research institutions. Regarding the use of research results, the AU and WHO have been promoting research-evidence-informed decision-making for several years, and the various policy and practice forums organised by regional organisations described above contribute to that over all agenda. But informants recognise that there are still gaps in capacity for research use by policy makers, noting there

is still room for improvement in training and advocacy. The knowledge translation and policy platforms provided by regional organisations should be supported by improving the capacity within national institutions to use health research (e.g. through dedicated research synthesis units). However, the ability to use research also relies on the receptiveness of decision-makers and whether they value research as part of their decision-making process.

Financing HSR

Financing represents the final core pillar explored, capturing the funding for research at the regional level, or contributions to funding schemes or programmes at the national level. We found fewer regional organisations involved in the financing of HSR than with the other three pillars of activity. Even within organisations with a specific mandate for health promotion or HSR (e.g. Africa CDC, WAHO, OCEAC, CAMES), internal funding of research missions is marginal. When they contribute to HSR in countries, these organisations generally seek funds from their partners for research grants to teams in countries or to conduct their own research.

Regional organisations in our study reported being involved in financing role more indirectly, through networking between their members and international donors and advocating for improving the financial resources available for HSR from national budgets of governments of African countries. While there are a few organisations contributing directly to funding HSR in member states, this is on a relatively limited scale with the exception of AAS whose mandate is to fund and promote excellence in African science. Organisations with expertise in health are the main regional bodies working in this area, through providing their own funds (e.g. small grants) or helping to facilitate access to funds through collaborating partners. For example, AfDB, SRO-EA/UNECA, IGAD fund research projects on themes of interest, through partnerships with local universities or the recruitment of experts. WAHO and CAMES foster networking of scientific teams for cross-border collaboration to apply for funding together and disseminate funding opportunities and international calls for proposals to their members and networks. WHO EMRO offers competitive research grants to countries in the region (which includes North African countries).

Much of the advocacy work to improve the domestic funding for HSR done by regional organisations seemed to be oriented towards national level governments, mainly through Ministries of Health (or in some cases Ministries of Higher Education). As an AU agency, AUDA is the only organisation we interviewed that has the potential to reach and interact with other relevant government ministries (i.e. development, environment, finance) and heads of state. But there has been limited success in advocacy to convince governments to invest in HSR, although some organisations reported that efforts to increase health sector budget overall have seen some success stories in many countries.

Nearly all informants cited dependence on foreign and external funds as an important barrier for the ownership and local benefits of HSR on the continent. Indeed, international partnerships are also key facilitators for HSR and capacity strengthening, but the reliance on these funds is concerning for the long-term sustainability of independent researchers and research institutions. The comparative advantage of regional organisations would be to use their collective power (speaking on behalf of multiple member states) to reorient their advocacy to audiences beyond their members such as development finance institutions and the private sector.

Gap analysis – Financing

Through its Science, Technology and Innovation Strategy for Africa (STISA-2024), the African Union is encouraging member states to allocate at least 1% of GDP to research and development to ensure that Africa maximises ownership and responsibility for its own developmental path and "mobilize domestic and alternative financial resources to accelerate implementation and reduce over-reliance on external resources" (African Union Commission, 2014). Regional organisations expressed that regional economic communities should be more involved in mobilising interest from alternative sources of funding to supplement public investments from governments and universities in HSR.

Several informants highlighted two important targets of advocacy for HSR financing (other than governments) which they consider gaps and currently untapped resources, and which regional organisations are uniquely positioned to approach. The first is development finance institutions. Regional organisations note that these have become increasingly interested in health, but questions remain about how regional organisations can advocate convincingly to these finance institutions on behalf of the member states. The second new target for advocacy is the private sector and business. Informants from several regional organisations acknowledge that their engagement with the private sector as a source of investment in HSR has been lacking despite the potential to do much more with this sector in Africa. One way to do this could be for regional organisations to work with countries to sensitise them to the benefits of private sector investment. Regional economic blocks could also help create a legal environment for private sector investment in national health research systems and private sector institutions as research producers. Large African corporations could contribute to financing HSR in a sustainable way. For example, the UNITAID model (a multilateral initiative using airline tax to support research on HIV/AIDS) is one potential mechanism that might be considered for adaptation in the African context as innovative financing through the private sector. Organisations like AUDA, SRO-EA/UNECA, and AfDB have opportunities to advocate for economic development through HSR innovation agendas and plans, but they have not been actively fostering connections with private sector and industry within their work with countries.

DISCUSSION

Barriers and facilitators of regional organisations' involvement in HSR

The above has presented our results that reflect on the role of regional organisations in relation to the four key pillars of health research systems. From this analysis, we identified a number of barriers and facilitators to their ability to help strengthen HSR. Some of the key barriers identified are summarised here:

- Lack of prioritisation of HSR at the national level

There was a strong consensus among informants that the low prioritisation of HSR by African governments is one of the most significant barriers to their work in this area. Knowledge and attitudes about HSR are generally poor among decision-makers, and health research is still not valued in many Ministries of Health, with insufficient resources for HSR and often the first budget line to go when trade-offs need to be made. The lack of prioritisation, of funding, and recognition of value for a research agenda at the national level makes it very difficult to address this at the regional level, as no government is advocating for it within regional arenas.

- Coordination and collaboration challenges for regional harmonisation

A second challenging area for regional organisations is collaboration and coordination with their member states. Barriers to collaboration included the difficulty to work across partners and member states who have different priorities, and sometimes competing priorities. Regional cooperation relies significantly on continuity in the representation of member states at the business and governance meetings of regional organisations, and this was said to be lacking by some. Also, it is difficult to monitor and follow policy changes on the ground in counties, which is a barrier to tracking the implementation and impact of regional policy decisions in individual countries.

- Donor driven priorities shaping the orientation of national and regional HSR priorities

Multiple informants we spoke to cited dependence on foreign donor funds as barrier to HSR ownership and benefits of research. They saw this as a barrier because these funds often concentrate HSR in areas of interest to international partners, for which the outcomes do not necessarily address the priorities for the country or needs at a more local level. This is a concern for regional bodies which help to connect external funders with member states since these organisations can be used by interests from outside the region to influence African decision-makers. Informants expressed that more funding is needed from within Africa (e.g. from governments, the AU, the private sector) to reduce the reliance on international funding and to support an African HSR agenda.

- Internal capacity of regional organisations

A fourth barrier to regional organisations' work that was highlighted by several key informants is the institutional capacity of regional organisations to work in this area. Regional organisations reported insufficient staff with HSR knowledge or expertise. When there is not strong leadership for the area or expressed interest from the member states, there can also

be a lack of awareness about HSR in the institutional culture. Most of the informants shared that the limited funding for regional organisations also presents a barrier for their work. Regional organisations in our study are funded by member states, by partners and international agencies, or a mix of the two. Depending on how the budgets are decided and allocated, some bodies shared that there is generally a lack of funding for implementing political commitments or statements, or to support countries to do the work that has been agreed. The capacity to govern, share information, and collaborate in multiple languages is also a challenge of internal capacity in this field for communication and for navigating different administrative and political cultures. Regional organisations which include Francophone countries did not generally report feeling well engaged in a some of the continental organisations, and continental organisations shared that while translation of documents is feasible, the language barrier is significant when it comes to collaboration or coordination operationally.

However, in addition to these barriers, there were also two key facilitators to the work of regional organisations identified as well:

- Institutional priorities, values, and leadership

Regional organisations stated that having a clear strategic vision on their goals related to HSR has been helpful to guide their own work in this area, especially when those priorities align HSR with their operational side. The importance of institutional values and the commitment of leadership within the organisation (e.g. the chief executive or senior management) were highlighted by many regional organisations as key factors supporting work in HSR.

- Collaboration and networks

Finally, there was a consensus across the regional organisations that collaboration with trusted partners has been vital because most of their work in HSR is done through collaboration. Many seemed to distinguish between the different roles that are played by financial partners (funders) and technical partners, and these partnerships span the range of international partners and African partners at both regional and national levels. For those organisations involved in producing and using research, collaborations provide funds, support regional cooperation on HSR, and extend the reach and impact of work to relevant stakeholders. Regional organisations have noted that they can often be in the positions of brokering such collaborations between external partners and member states or African partners, and as such they try to ensure those have mutual benefits for countries. But the demand-driven south-south collaborations were particularly highlighted by informants as important for creating synergies and supporting learning for HSR across partners. Informants from organisations in a couple sub-regions (e.g. West Africa) cited the history of collaboration in the sub-region and strong networks between the countries, which were seen to be valuable foundations for more proactive and sustainable approaches - especially when they can tie into centres of excellence and research leaders in the sub-region.

Cross-cutting themes

In addition to these more specific barriers and facilitators, we also are able to identify a few key cross-cutting issues that emerged as particularly important in influencing regional organisations' contributions to strengthening HSR in Africa.

Mandates matter

In our analysis of activities related to strengthening the pillars of HSR, the institutional mandates and areas of authority of regional bodies were among the most common factors mentioned as influencing their involvement in any particular pillar. While many of the regional organisations share a common mandate to support integration, the policy areas that this extends to, and the resources available to facilitate and maintain programmes to achieve that agenda, can vary greatly. Organisations with policy-area focused mandates related the main sectors responsible for governing HSR at the national level (i.e. health, education) seemed to have comparative advantages. For example, this technical expertise and mandate come through as important factors facilitating their roles in governance, creating and sustaining resources, and producing and using research which are supported by their relationships and access to experts, decision-makers, and networks in their member states in these policy fields.

However, even when health is part of an organisation's core mandate, there is no regional organisation in our study whose principal mandate is health research (although it is integral to Africa CDC mandate to strengthen national public health capacity in Africa). The AU and UN organisations like Africa CDC, AUDA, and WHO are unique technical organisations, given their intergovernmental mandates for health or development across a large geographic scale (in the case of AU continent-wide). Each have different institutional designs with mechanisms for working with member states: Africa CDC through its 5 regional collaborating centres, AUDA through the regional economic communities, and WHO working directly with countries via Ministries of Health and their country offices. This contrasts to the work carried out by regional bodies in sub-regional blocks with technical organisations in health and development who work directly with dedicated country representatives from ministries to their organisations and other institutions in member states (e.g. universities).

Power: institutional authority and state sovereignty

Related to mandates and institutional design, regional organisations also were found to exercise their authority in different, yet important, ways. For example, many organisations exhibit epistemic power within their domains of expertise, as recognised and legitimate authorities in the policy areas of health, development, education, or science. However, the knowledge of regional organisations is moderated by a number of constraints on their persuasive or coercive power to effect and enforce change based on their expertise. Structurally, many of the regional organisations we interviewed are governed by member states, and as such, state-based regional cooperation relies on the decisions and voluntary actions of states, which can be a barrier since regional organisations do not have authority to enforce the implementation of decisions taken at the regional level. Many reported that the commitment of membership to regional work is necessary because state inaction or state action that does not align with regional priorities can hinder progress.

One of the main assets of regional organisations is their convening power and access to decision makers. Many of them have access to advocate directly to Ministries of Health, Education, Science and Innovation, and Finance, as well as heads of state in some instances. This provides opportunities to influence political commitment, create fora for dialogue, and mobilise African and international stakeholders. However, translating that institutional legitimacy and prestige into action to strengthen HSR at the national level has seen very slow progress and with varied results. For instance, the development of the AUDA continental strategy for Health Research and Innovation in Africa (African Union Agency for Development, 2019) has demonstrated the epistemic and convening power of the organisation to engage

with the regional economic communities, member states and other stakeholders to collectively set and agree on an agenda, but moving towards its implementation may require other forms of power (e.g. persuasion, coercion) and cooperation that can leverage support, produce change, and foster collective action.

Opportunities: what's still missing

Finally, across all four key pillars, we identified areas where activity appears to be missing, but which could be important strategic areas for regional bodies to consider in efforts to improve HSR in Africa. Related to the governance pillar, more clarity is needed on the role of regional organisations at the continental level versus those at the sub-regional level in framing the agenda for strengthening HSR. We found examples of strategic documents and regional policies in HSR developed by AUDA, WHO AFRO, and Africa CDC as intergovernmental organisations which cover the continent and actively setting the policy framework for countries to adapt and align their national policies and programmes for strengthening their national health research systems. From our analysis, this raises questions about the top-down or bottom-up governance of HSR regionally because it is unclear whether these regional policies are intended to be used for policy transfer and replication in countries, or whether they are rather used as targets to set the evaluation criteria against which progress in countries will be monitored. Regional organisations see their role as providing implementation support for these policies, but, while there are examples of support to countries available, this is still lacking on a wide scale. There thus seems to be little being done by regional organisations to explore how they could support policy learning between and among countries. Secondly, while many national decision-makers and researchers see the development of a national health research law as the gold standard for formalising the national health research systems, none of the regional organisations in our study stated working with countries to support the development of a legal framework for HSR.

Related to the resources and infrastructure pillar, and linked to the above on governance, we found little support from regional organisations in developing capacity of national regulatory institutions for STI or HSR despite the wide efforts to harmonise regulation in sub-regions for select policy areas (aside from capacity building for IRBs and ethics review). We found similar results in our study of national health research systems, wherein international funding is available for HSR and research capacity, but more rarely for regulatory capacity. Yet, developing statutory institutions with regulatory and coordinating mandates for HSR (e.g. national health research authorities) can be valuable to creating an enabling environment, especially to integrate coordination between government authorities and research institutions (Jones et al., 2021).

Also related to improving the resources for HSR, our previous research on national health research systems showed that regional research networks can be important mechanisms to foster research leadership and research culture, as well as generate advocacy for HSR within countries. We spoke to only two organisations (WAHO, AAS) that reported actively and financially supporting the development of regional research networks in Africa. However, regional organisations recognise that a lot of capacity development at the regional level is supported by regional networks, research platforms, and think tanks and often with collaboration of universities and other partners both within and outside Africa (e.g. Africa Population Health Research Council). There is an opportunity for networking the networks that could fit within the broader mandate of integration of regional organisations with particular

expertise, so that the existing health research networks are included in resources available for regional organisations' work with member states.

Related to the pillar of research production and use, among those regional organisations who spoke about research priorities, there seems to still be clear link missing that aligns these with the needs or priorities at the country level in a systematic way. Without this, regional organisations may not be working with clear research agendas that are produced by priority setting exercises at the national level, which would foster their eventual use.

Finally, there seems to be two pillars wherein several regional organisations have an active advocacy agenda to their respective counterpart ministers (of health, of science, of higher education): research use and financing of HSR. Yet, the perception of advancement towards increasing these two critical areas for HSR seems low, and without clear strategies to more effectively engage members and stakeholders on these topics to not only increase their awareness but improve action.

CONCLUSION

This project has explored what roles regional organisations play in strengthening HSR in Africa. We inventoried and mapped regional stakeholders according to evidence of their interests in HSR or STI available from websites and documents. We further interviewed 18 key informants from 15 organisations prioritised from the mapping exercise to explore how they are involved in HSR, what kind of impact they are having, and their ideas about what else regional organisations should be doing. We analysed the interview data according to the four key pillars for strengthening health research systems, and the results are presented under the same themes: governance, creating and sustaining resources, producing and using research, and financing.

Our findings show that many organisations are doing something related to supporting HSR, but those organisations with comparative advantages have mandates related to supporting HSR; expertise in health, education, or science policy fields; and strong partnerships and networks underpinning their work in this area. The pillar of financing HSR is not an area in which regional organisations are contributing much to directly, although they are all advocates for African governments to increase investment in HSR. Several gaps in activities were identified by regional organisations where they should be more involved: better coordination within and across sub-regions, strengthening infrastructure for HSR at the national or regional level, improved training and advocacy for research use, and engagement with the private industry sector and development institutions to increase financing of HSR.

Facing the opportunities and challenges for improving the structures, outputs, and innovations of health research systems, regional bodies will no doubt play important roles in strengthening HSR in Africa. This is one of the first attempts to identify and explore them in-depth. We hope that this will help contribute to future work in this area on the ways that regionalism may strengthen the development of HSR towards improving the health systems, health, and development in Africa.

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Appendix 1. Stakeholder Map of Regional Organisations supporting HSR in Africa

Type of regional organisation	Principal Organisation	Sub-Organisation	Headquarters	Region
Technical (Health)	Africa CDC	Secretariat	Addis Ababa	
Technical (Health)	Africa CDC	Central Africa Regional Collaborating Centre	Libreville	Central
Technical (Health)	Africa CDC	Eastern Africa Regional Collaborating Centre	Nairobi	Eastern
Technical (Health)	Africa CDC	Northern Africa Regional Collaborating Centre	Cairo	North
Technical (Health)	Africa CDC	Southern Africa Regional Collaborating Centre	Lusaka	South
Technical (Health)	Africa CDC	Western Africa Regional Collaborating Centre	Abuja	West
Technical (Science)	African Academy of Sciences	Secretariat	Nairobi	Continent-Wide
Technical (Science)	African Academy of Sciences	The Alliance for Accelerating Excellence in Science in Africa	Nairobi	Continent-Wide
Technical (Science)	African Academy of Sciences	Coalition for African Research and Innovation	Nairobi	Continent-Wide
Economic, Technical (Development)	African Development Bank	Secretariat	Abidjan	Continent-Wide
Technical (Health)	African Federation of Public Health Associations		Yamoussoukro	Continent-Wide
Economic	African Organisation for Standardisation		Nairobi	Continent-Wide
Technical (Science)	African Regional Intellectual Property Organization		Harare	South, East, Central, West
Technical (Science)	African Scientific, Research and Innovation Council		Abuja	Continent-Wide
Technical (Science)	African Union	African Observatory of Science Technology and Innovation	Oyala	Continent-Wide
Technical (Science)	African Union	Specialised Technical Committee on Health, Population, and Drug Control		

Type of regional organisation	Principal Organisation	Sub-Organisation	Headquarters	Region
Technical (Development)	African Union Development Agency	Secretariat	Midrand	Continent-Wide
Technical (Health)	African Union Development Agency	African Medicines Regulatory Harmonization Initiative		
Technical (Health)	African Union Development Agency	Southern African Network for Biosciences	Pretoria	South
Technical (Health)	African Union Development Agency	Biosciences Eastern and Central Africa	Nairobi	East, South
Technical (Health)	African Union Development Agency	West African Network of Biosciences	Dakar	West
Technical (Health)	African Union Development Agency	North African Network for Biosciences	Cairo	North
Technical (Science)	African Union Development Agency	African Ministerial Council on Science and Technology	Pretoria	Continent-Wide
Technical (Science)	African Union Development Agency	Center of Excellence: Science, Technology and Innovation Hub	Pretoria	
Political	African Union Commission	Secretariat	Addis Ababa	Continent-Wide
Economic, Political	Arab Maghreb Union		Rabat	North
Economic	Common Market for Eastern and Southern Africa		Lusaka	North, East, Central, South
Economic	Community of Sahel-Saharan States		Tripoli	North, East, West, Central
Technical (Development)	Conseil Africain et Malgache pour l'Enseignement Supérieur		Ouagadougou	West, Central, East
Economic	East African Community	Secretariat	Arusha	Central, East
Technical (Education)	East African Community	Inter-University Council for East Africa	Kampala	Central, East
Technical (Health)	East African Community	East African Health Research Commission	Bujumbura	Central, East
Technical (Health)	East African Community	East African Disease Surveillance Network	Arusha	East

Type of regional organisation	Principal Organisation	Sub-Organisation	Headquarters	Region
Technical (Science)	East African Community	Science, Technology and Innovation Commission	Kigali	East
Technical (Health)	East African Public Health Laboratory Networking Project		Arusha	East
Technical (Health)	East, Central, and Southern Africa Health Community		Arusha	East, Central, South
Economic	Economic Community of Central African States		Libreville	Central, West
Economic	Economic Community of West African States		Abuja	West
Technical (Health)	Economic Community of West African States	West African Health Organisation	Bobo-Dioulasso	
Political	Indian Ocean Commission		Port Louis	East
Economic	Intergovernmental Authority on Development		Djibouti	West
Technical (Science)	Network of African Science Academies		Nairobi	Continent-Wide
Economic	Organisation Africaine de la Propriété Intellectuelle		Yaoundé	
Economic	Southern African Development Community		Gaborone	South, East, Central
Technical (Science)	Southern African Development Community	Science and Technology Desk	Gaborone	South, East, Central
Technical (Development)	United Nations	Economic Commission for Africa	Addis Ababa	
Technical (Health)	World Health Organization	African Regional Office	Brazzaville	Continent-Wide
Technical (Health)	World Health Organization	Eastern Mediterranean Regional Office	Cairo	North
Technical (Health)	World Health Organization	African Vaccine Regulatory Forum	Brazzaville	Continent-Wide

Appendix 2. List of priority organisations identified for interviews

Africa CDC

African Academy of Sciences

African Development Bank

African Regional Intellectual Property Organization

African Union

African Union Development Agency (NEPAD)

Arab Maghreb Union

Common Market for Eastern and Southern Africa

Community of Sahel-Saharan States

Conseil Africain et Malgache pour l'Enseignement Supérieur

East African Health Research Commission (East African Community)

East, Central, and Southern Africa Health Community

Economic Community of Central African States

Intergovernmental Authority on Development

Inter-University Council for East Africa (East African Community)

Southern African Development Community

United Nations Economic Commission for Africa

West African Health Organisation (Economic Community of West African States)

WHO African Regional Office

WHO Eastern Mediterranean Regional Office

Appendix 3. Key informant interview guide

Guide for interviews with Regional Organisations' staff, leadership, or members

Q1. What role do region organisations in Africa have in health sciences research?

Q2. Which of these roles is your organisation involved in?

NOTE: It is not necessary to ask all of the probes and follow up questions under Q2. These are here as reminders of the information that we want to collect, so that if it does not arise from the informant's reply to the open question, the interviewer can ensure to follow up on those areas that are priorities and probe for more information when needed. We want to focus on the main pillars, and a couple of processes that we know are key themes for regional cooperation from the former project.

Depending on the replies from informants to the open question here, interviewers should follow up with explicit questions about their organisation's own work directly on or in support of the four main **pillars** in other countries or with members. An informant's initial response may cover some of them. If they have mentioned any of these four in their reply, these can be followed up explicitly for deeper exploration. If not, the interviewer will ask about the other pillars not mentioned, because we want to be sure to have data about these.

The **process** themes may cut across the four pillars, as they may intersect with how the regional organisation is working in HSR. It is not important to go through each process theme in every interview, unless it has been brought up by the informant or seems relevant to their replies about the role their organisation plays. Three processes are prioritised for data collection (advocacy, international partnerships and collaboration, and coordination) because these were highlighted in the former project as important advantages for regional cooperation and advantages. It is left to the discretion of the interviewer to ask about the other process themes specifically with regard to the key processes that regional organisations are involved in.

Probes and follow-ups for Q2:

P2.1. Where are your efforts to support health sciences research concentrated? In which country/ies is your organisation doing this?

Main HSR pillars – to learn not only about what they are doing, but how they are doing it

P2.2 – Financing

How does your organisation finance health sciences research?

If further details needed on the how: What funding mechanisms does your organisation use for this? How are these funds used in countries?

P2.3 – Governance (regulation, policies, legislation, supervision/oversight)

How does your organisation participate in the governance of health sciences research at the national or regional level?

P2.4 – Creating and sustaining resources (human and institutional capacity, infrastructure)

How does your organisation contribute to strengthening capacity for health sciences research at the national or regional level? (e.g. support to individuals, universities and research institutions, Centres of Excellence, national/regional laboratories)

P2.5 – Producing and using health sciences research (knowledge translation, research use)

How does your organisation support the uptake of health sciences research results in the region?

Key processes* for HSR – to learn about the processes used to carry out their work on HSR

P2.6 – Advocacy

How does your organisation advocate for strengthening health sciences research in the region?

P2.7 – Collaboration

What kinds of partnerships and collaborations is your organisation involved in that support health sciences research in national settings or across the region?

P2.8 - Coordination

How does your organisation coordinate work in health sciences research with countries or with other organisations in the region?

*Other process themes for follow-up when relevant to the interview based on previous replies include: sustainability, alignment/prioritisation, sustainability, ownership/

Q3. What do you think has been the impact of your organisation's work (through any of the roles you discussed above) to strengthen health sciences research in specific countries or the region more broadly?

If there is an example of impact or influence, then ask**:** How did your organisation achieve that influence?

Q4. Why has strengthening health sciences research (through any of the roles you discussed above) become a part of your organisation's portfolio? (or why has it not?)

If further details needed on the how: What supported the inclusion of this in your organisation's activities? How did it support this?

Probes and follow-ups for Q4:

P4.1 - What policies or strategies does your organisation have to support health sciences research among your members or in the region?

P4.2 - What would make your organisation increase /or/ begin support of health sciences research in the region?

Q5. What have been the main facilitators to your organisation's work to strengthen health sciences research?

If further details needed on the how: How have these facilitated your organisation's work?

Q6. What have been the main barriers to your organisation's work to strengthen health sciences research?

If further details needed on the how: How have these hindered your organisation's work?

Q7. In your opinion, what should be the role of regional bodies to strengthen health sciences research in Africa? Why?

Q8. From your perspective, which are the most active and influential regional organisations that are strengthening health sciences research in specific African countries or any sub-regions?

Q9. Can you suggest any contacts in those organisations with whom we might speak?

Appendix 4. Interview Coding Guide

	Code	Description	Empirical*	Normative*	Impact*
HSR Pillar Codes	1. Governance	When informant discusses the role of regional organisation in governance of HSR. - Legal framework for HSR. This includes formal agreements and treaties. - HSR regulation. This includes the institutional structures, intellectual property, and national or regional regulation that guide HSR. - STI and development policies and priorities relevant for health research domain. This includes a broad range of policies that are tangentially related to HSR such as STI, education, and potentially environment. - HSR policies, strategies, and priorities (i.e. institutional policies of regional organisation on HSR, or those of organisation's members). - Ethics and IRB initiatives, networks, and standardisations. - HSR governance, norms and guidelines. This includes explicit initiatives or position papers on the governance of health research.	1.1	1.2	1.3
	2. Infrastructure / Capacity	When informant discusses the role of regional organisation in infrastructure and human or institutional capacity strengthening of HSR. - Health research institutions, universities, HSR collaborations, and national research centres, Centres of Excellence. - National Laboratories. - Research Management systems. - Education, training, mentoring.	2.1	2.2	2.3
	3. Production / Use	When informant discusses role of regional organisation in producing and using HSR. - Involvement in knowledge production (projects, programmes). - Access and availability of HSR results.	3.1	3.2	3.3

		- Knowledge translation platforms for knowledge use, application, adoption, evaluation. - Visibility and dissemination (including scientific publications and conferences, multi-stakeholder platforms, and the public).			
	4. Financing	When informant discusses role of regional organisation in financing HSR. - Regional health research funds. - National funding schemes. - Resource mobilisation and financing instruments.	4.1	4.2	4.3
Processes Codes	5. Advocacy	When informant discusses what advocacy the regional organisation does or should do for HSR. Ability and arguments to communicate with and convince policy-makers and politicians for research support and research use (about relevance/significance of HSR and for any of the pillars of HSR).	5.1	5.2	
	6. Collaboration	When informant discusses what collaboration the regional organisation engages in or should engage in for HSR. - Partnerships and collaborations with other stakeholders (national governments, international organisations, regional organisations, NGOs, funders, universities, private sector industry, communities). - Networks/networking - North-South, South-South, Anglophone-Francophone, African region (continent), sub-regional. Conferences, seminars, or other partner meetings, and networking platforms in the region.	6.1	6.2	
	7. Coordination	When informant discusses what coordination the regional organisation does or should do for HSR. - Coordination institutions/structures, mechanisms, arrangements. Information management.	7.1	7.2	
	8. Alignment	When informant discusses what alignment or harmonisation the regional organisation does or should do for HSR. - Alignment of HSR with the national or regional contexts, e.g. linking the strategic visions to empirical realities on the ground, linking HSR to population needs / health priorities, linking HSR to goals for improving health and/or health systems, linking HSR to development (economic or social) and/or innovation.	8.1	8.2	

		- Alignment of HSR with other policies, programmes, strategies (health, development, etc.) at local, national, regional and/or international levels.			
	9. Innovation	When informant discusses what regional organisations does or should do for innovation of HSR. - The application of research ideas for developing new products and technologies. - Creation of new business, products, services from HSR (e.g. patent development).	9.1	9.2	
Key Issues	10. Ownership	When informant discusses what the regional organisation does or should do for improving and increasing national or regional ownership of HSR.	10.1	10.2	
	11. Sustainability	When informant discusses what the regional organisation does for improving and increasing sustainability of HSR at the regional or national level.	11.1	11.2	
Key Barriers and Supports	12. Barriers	Main barriers to the regional organisation's work to strengthen HSR. Factors which hinder the regional organisation's work.			
	13. Facilitators	The main facilitators to the regional organisation's work to strengthen HSR. The factors which have supported the regional organisation's work.			
	14. Motivation	The reasons why the regional organisation has included work to strengthen HSR as part of its portfolio (or why has it not?). The factors that support, or the rationale for, the inclusion of this in the regional organisation's activities.			
Other	15. Other	When using the "other" code, insert a note or attach a linked memo to specify what the code theme is and why it is important to highlight as an emergent theme.			
	16. Great quote	Strong quote that communicates clearly an idea or theme very well.			
*When applicable, interviews were coded along three domains: 1) Empirical - informants perceive their organisations' activities and involvement in HSR; 2) Normative - how informants believe regional organisation should be engaging with HSR; 3) Impact - where informants perceive their regional organisation has had impact in HSR.					

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