Regional landscape of national public health institutions in Africa and their role, scope and capacity in supporting health systems resilience
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Preface

The report was produced as part of the World Health Organization (WHO) and the United States Agency for International Development (USAID) collaboration on health system resilience and essential public health functions. The aim of this review is to ascertain the role, scope and capacity of national public health institutions within the African context in contributing to health system strengthening and resilience through the essential public health functions.

Target audience

The primary audience for this report includes global, national and subnational health authorities, including the national public health institutions, ministries of health and allied ministries involved in public health.
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Acronyms

Africa CDC  Africa Centres for Disease Control and Prevention
COVID-19   coronavirus disease 2019
EPHF      essential public health function
IANPHI    International Association of National Public Health Institutes
IHR 2005  International Health Regulations 2005
NPHI      national public health institutes
UHC       universal health coverage
US CDC    United States Centers for Disease Control and Prevention
WHO       World Health Organization
Executive summary

Acute, protracted major public health events – for example, the 2014–2015 West Africa Ebola virus disease outbreak, the ongoing coronavirus disease 2019 (COVID-19) pandemic, climate change-related events, and war and conflicts – underscore the need to enhance public health capacity in health and allied sectors in all countries. Better capacity will improve health systems resilience to withstand shocks, prevent small events from becoming large-scale emergencies and manage essential health services. Essential public health functions (EPHFs) are a set of multisectoral, interconnected and interdependent activities, typically under the responsibility of the State, which are required for health promotion, health protection and disease prevention at the population level. They provide a clear and holistic frame for operationalizing public health and have been identified as the most cost-effective, comprehensive and sustainable ways to enhance the health of populations and individuals and to reduce the burden of disease. Given their multisectoral nature, dedicated accountability, oversight and coordination of the EPHFs is needed through national policy, planning, infrastructure and services. Countries use different models of public health governance that reflect their institutional and regulatory arrangements and objectives.

This review aimed to ascertain the role, scope and capacity of national public health institutions (NPHIs) in the African context in contributing to health system strengthening and resilience through the EPHFs. The specific objectives include: (i) mapping NPHIs within Africa, including their presence, distribution, governance arrangements, regional and global collaborations, and the support they receive; and (ii) elucidating the scope of NPHIs’ activities in relation to the EPHFs, including NPHIs contributions to health system strengthening and resilience at the country level. Good practices and lessons were also identified and can inform the priority setting and policy actions in countries across the region.

Key findings

1. Presence and distribution of NPHIs in Africa

Of the 54 countries in the African region 37 (68.5%) have NPHIs: 11 in West Africa, 10 in East Africa, 6 in Southern Africa, 6 in North Africa and 4 in Central Africa. Some NPHIs were formed as an immediate response to a public health event that indicated the need for specific capacity or leadership and coordination within the health system (e.g. Sierra Leone after the 2014–2015 Ebola virus disease outbreak), while others were established because of the growing need to consolidate public health functions under one roof and streamline coordination for optimal health outcomes.

2. NPHI governance structures including enabling legislation and policies, institutional financing and human resourcing

Different NPHI governance structures exist within the African context and NPHIs have varying degrees of autonomy and accountability to ministries of health. Oversight of EPHFs by NPHIs also has different models. Some countries such as Liberia have a number of the EPHFs under the oversight of a single NPHI and others directly under the health ministry. In other countries
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(e.g. Democratic Republic of the Congo), several public health entities are responsible for a range of EPHFs. NPHIs are typically guided by legislative instruments (e.g. national health acts, regulations and executive decrees) that govern their establishment, operations and mandates, and provide an enabling legislative framework. National budgets are a source of funding for NPHIs, in some cases complemented by private funding from donors.

3. Role of regional and global bodies and networks in supporting NPHIs

Regional and global bodies and networks, such as the Africa Centres for Disease Control and Prevention, the World Health Organization (WHO) Regional Office for Africa, the International Association of National Public Health Institutes, and the United States Centers for Disease Control and Prevention, have supported public health including NPHIs within the African region through building and strengthening institutional capacity (for example by encouraging the setup of national public health institutes, training of personnel and knowledge sharing). Other collaborations are in the form of bilateral and multilateral engagements between countries. In addition, WHO collaborating centres within the region have supported countries in specific public health capacity, with some NPHIs playing a dual role of serving as an NPHI and a WHO collaboration centre for the benefit of the region and the rest of the world.

4. Scope of NPHI activities in relation to the EPHFs and contribution to health system resilience

The scope of NPHI activities varies, with surveillance, health emergency response, public health research, laboratory systems and health workforce training being common areas of their work. Various regional and global entities (WHO, Africa CDC, International Association of National Public Health Institutes) have proposed lists of EPHFs as guidance for NPHIs; these lists are complementary and consistent in terms of the proposed scope of NPHIs. The scope of NPHI functions and activities also varies depending on NPHI maturity, with new NPHIs (e.g. in Kenya, Malawi, Uganda and Zambia) having a broader scope that adopts a holistic approach to health system strengthening. The scope of the EPHFs in some NPHIs includes broader health system strengthening characteristics, such as community engagement, social and other determinants of health, and equitable, integrated health service delivery.

5. Consideration of the EPHFs in national, regional and global frameworks, legislation, policies and plans for NPHIs

The World Health Assembly resolution WHA69.1 emphasizes that strengthening EPHFs provides an integrated approach to building public health capacity and contributes to health system resilience. At the regional level, several WHO regional resolutions also provide a strategic framework for countries to anchor their national policies and efforts. At the national level, NPHIs are guided by legislation such as acts, decrees, orders and statutory instruments, some of which provide a specific explanation and guidance on the function, role and scope of the mandate and authority of the NPHIs. National legislative frameworks for the establishment of NPHIs, such as that of Kenya, provide a rationale and expanded scope for consideration of EPHFs to guide the mandate and activities of NPHIs. National health sector plans (e.g. in Zambia) acknowledge that placing the responsibility for public health under different ministerial authorities and external partners without adequate coordination hampers effective delivery of public health functions.
6. Enabling environment for NPHIs to promote an integrated approach to public health

An enabling environment for NPHIs to effectively exercise their mandate and promote an integrated approach to public health capacity development has been identified in some cases. This includes strong leadership and government commitment; multisectoral collaboration; sustained relationships and data sharing between NPHIs and allied agencies; and support at the subnational level to increase operational capacities (e.g. funding, training, staffing, or short-term and long-term staff deployed from the NPHI).

7. Monitoring and evaluation mechanisms for EPHF implementation

Comprehensive and holistic monitoring and evaluation mechanisms for NPHIs’ capacity for the implementation of EPHFs are limited. The International Association of National Public Health Institutes proposed the staged development tool to evaluate the current capacity NPHIs and Africa CDC highlights several key characteristics to foster effective NPHI accountability mechanisms. Furthermore, processes for monitoring and evaluating the operationalization of EPHFs are fragmented. Some public health functions, such as immunization, and the health workforce, are monitored through routine health systems information systems such as District Health Information Software (DHIS2), while other functions are monitored through other complementary assessment mechanisms (e.g. the International Health Regulations 2005 (IHR 2005) monitoring and evaluation framework, service availability and readiness assessment, and programme-specific assessments). EPHF self-assessment tools developed by WHO regional offices such as the WHO Regional Office for the Eastern Mediterranean, have also been used.

Key areas to inform policy and actions

- Many opportunities exist to utilize regional and global partnerships and collaborations, as well as the shared learning from bilateral and multilateral partnerships, to improve public health capacity and strengthen health system resilience.

- Implementation of EPHFs requires an effective multisectoral, whole-of-government approach. For example, depending on country context, this would entail ministries of health and national public health institutions working with other line ministries such as ministries of education, agriculture, transport, planning etc. given their stake in public health. This can be facilitated through NPHIs with clear mandates and necessary autonomy that enable them to effectively work and coordinate with other ministries to strengthen health system resilience. To address this, WHO has developed a roadmap on health workforce development for public health based on WHO’s updated list of EPHFs to ensure a holistic coverage of public health skills and competencies of health workforce at country level.

- NPHIs have contributed to developing health workforce public health competencies through training at national and subnational levels. A continuing missed opportunity has been the narrow scope of workforce capacity development, which is mostly focused on epidemiology and other aspects of public health emergency management. Inadequate consideration is given to the wider scope of EPHFs to enable an integrated approach to health system strengthening and resilience.
• As more countries establish NPHIs, particularly in the wake of ongoing public health events such as COVID-19, there is a need to foster and advocate for a wider spectrum of EPHFs that contributes to building health system resilience and addressing the health determinants, as well as to traditional health emergency related functions. A more systems-oriented approach to EPHFs within public health authorities and services would reflect the growing and evolving profile of global health challenges and provide countries with better capacity in all critical dimensions of public health, instead of a narrow subset of functions.

• As global and regional policies play a fundamental role in shaping a country’s direction on institutional arrangements for public health, WHO, technical partners and donors need to support and help reorient NPHIs towards an integrated and systems approach to building resilience. This should include dedicated and improved financing of all EPHFs and the role of national public health institutions in facilitating the required multisectoral responsibility and accountability for its effective delivery.

• The EPHFs, as an integrated approach to health system strengthening, provide a much-needed opportunity to harmonize various public health-related assessments and planning to better inform global and national actions for strengthening the role of NPHIs in building health system resilience to public health challenges.

**Conclusion**

The prevailing approaches to investment in public health is fragmented and inadequate. The COVID-19 pandemic has reinforced the need for holistic approach to building public health capacity with strong leadership from national to subnational level. With lessons from different past and ongoing public health events, national authorities and their partners need to systematically appraise the extent of public health consideration and orientation in their policies, planning, infrastructure and services. In terms of national stewardship, there has to be context-appropriate coordination mechanism for comprehensive and coherent delivery of EPHFs between and within health and allied sectors reflective of population health needs. The role of global institutions including United Nations Organizations focusing on health, development and donor partners, multilateral technical institutions, will remain key in fostering collaboration, transferring knowledge and good practices, and promoting an integrated approach to building health system resilience with adequate focus on public health at all levels including primary care.
Recent public health events, including the coronavirus disease 2019 (COVID-19) pandemic and climate change-related events, continue to demonstrate the critical importance of resilient health systems in safeguarding global health security and sustaining progress towards universal health coverage (UHC). UHC and health security are recognized as mutually interdependent goals, however, traditional efforts aimed at these global targets are often fragmented with inadequate attention to the essential public health functions (EPHFs) required for health system resilience. The EPHFs are a set of multisectoral, interconnected and interdependent activities, typically under the responsibility of the State, which are required for health promotion, health protection and disease prevention at the population level. When comprehensively prioritized, coordinated, resourced and delivered, the EPHFs enable health systems to meet population health needs and therefore have the greatest impact on the public’s health (1).

Public health is central to health system functions. Enhanced public health capacities enable health systems to withstand shocks and stressors of varying degrees and prevent small events from becoming large-scale emergencies. Embedding attention to public health consideration in efforts to strengthen health system can introduce and sustain several fundamental attributes of resilient health systems, including: (i) awareness of risks, vulnerabilities and capacities; (ii) integration within and across health and allied sectors; (iii) swift mobilization of resources in response efforts; (iv) self-regulation and adaptability of the system to emerging priorities; and (v) learning and transforming as necessary, based on experience. The EPHFs provide an integrated, holistic approach to strengthening public health capacities (2) (Box 1) as part of health system strengthening efforts to improve resilience. The EPHFs enhance cross-cutting attention on population health needs from protection to prevention and health promotion with consideration of equity and the wider determinants of health. This unified approach, rather than the prevailing fragmented approach, can make the most of available, and usually limited, resources to address public health challenges (2).

Box 1. WHO’s consolidated list of the essential public health functions (2)

1. Monitoring and evaluating the population's health status, health service utilization and surveillance of risk factors and threats to health
2. Public health emergency management
3. Assuring effective public health governance, regulation and legislation
4. Supporting efficient and effective health systems and multisectoral planning, financing and management for population health;
5. Protecting populations against health threats, including environmental and occupational hazards, communicable disease threats, food safety threats, and chemical and radiation hazards
6. Promoting prevention and early detection of diseases, including noncommunicable and communicable diseases
7. Promoting health and well-being and actions to address the wider determinants of health and inequity
8. Ensuring community engagement, participation and social mobilization for health and well-being
9. Ensuring adequate quantity and quality of the public health workforce
10. Assuring the quality of and access to health services
11. Advancing public health research
12. Ensuring equitable access to and rational use of essential medicines and other health technologies
Investment in the EPHFs, with strengthened national stewardship for public health, is the most cost-effective, comprehensive and sustainable way to improve population and individual health and make progress towards global goals through resilient health systems (3). For the EPHFs to contribute most effectively to health system strengthening efforts, a holistic understanding of the roles of the organizations responsible for public health functions is needed (1).

National public health institutes (NPHIs)1 are key to supporting health system strengthening with the EPHFs and generating evidence for health policy is central to national health and socioeconomic development (4). The International Association of National Public Health Institutes defines NPHIs as “a government agency, or closely networked group of agencies, that provides science-based leadership, expertise, and coordination for a country’s public health activities” (5). Globally, many NPHIs have emerged to address acute health threats or enduring public health challenges. For example, some originate from infectious disease control, laboratory services, and hygiene traditions with their mandates and scope of operations gradually expanded to manage other complex, multidisciplinary health challenges such as noncommunicable diseases, climate change and antimicrobial resistance (6).

There is a need for institutions such as NPHIs with ministries of health to provide leadership and coordination of public health functions across various sectors (e.g. health services and social care, food and agriculture, environment, and education). To reduce fragmentation in efforts to strengthen health systems requires the scope and capacity to: (i) inform integrated policy-making, planning and stewardship of the EPHFs; (ii) ensure comprehensive and integrated delivery of the EPHFs; and (iii) improve accountability and monitoring of the EPHFs. NPHIs with the capacity to address these three areas can play a key role in building health system resilience by ensuring effective management of public health challenges including emergencies and other health system stressors and supporting the maintenance of essential individual and population health services.

2. Objectives and scope

This review aimed to ascertain the role of NPHIs within Africa in contributing to health system strengthening and resilience, including their scope and capacity, in relation to the EPHFs. The specific objectives were to:

- Conduct a mapping of NPHIs within the African region, including their presence, distribution, regional and global support, governance arrangements, resourcing, and collaborations and networks.
- Elucidate the scope of activities of NPHIs in relation to the EPHFs, and their contributions to health systems strengthening and resilience at the country level.
- Identify good practices and lessons on the role of NPHIs in health system strengthening and resilience that could be adapted to inform priority setting and policy actions in countries across the region.

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1 NPHI within this paper is used as an umbrella term for public health institutions including national public health institutes, public health agencies, or other equivalent entities, e.g. within the ministry of health and dedicated to public health within a country.
Regional variations may exist in the scope, framing and list of EPHFs, with some regions such as the WHO region is the Region of the Americas and the WHO European Region framing the EPHFs as services or operations. A common set of functions based on an analysis of different authoritative lists of EPHFs (2) will be used to frame the scope of the EPHFs for this review (Box 1). In cases where the term or framing of the EPHFs is not used as such within the African context, references to public health capacities, functions, operations, actions, services and similar terms within the relevant institutions, will also be included in the review. To clarify the scope and definition of an NPHI, the definition of the International Association of National Public Health Institutes, with its core attributes, was used. According to the International Association of National Public Health Institutes, an NPHI is a government agency, or closely networked group of agencies, that provides science-based leadership, expertise, and coordination for a country’s public health activities” (5). An NPHI is defined by its infrastructure, what it does and how it does it, and it has the following attributes (7):

- national scope of influence
- national recognition
- limitations on political influence
- scientific basis for programmes and policies
- focus on the major public health problems affecting the country
- adequate human and financial resources
- adequate infrastructure support
- linkages and networks
- accountability.

3. Methods

The review adopted a systematic approach, using publicly available peer-reviewed literature from scientific databases (PubMed/MEDLINE and Web of Science) and grey literature from WHO’s institutional repository (Iris); websites of the World Bank, International Association of National Public Health Institutes, United States Centers for Disease Control and Prevention (US CDC), Africa CDC, ministries of health or NPHIs in Africa, and Google Scholar.

Search term combinations were used in each of the sources above and these were adapted to suit the requirements of the data source. These terms included: (“public health institut*” OR “public health agency” OR “national public health institut*” OR “institut national de santé publique” OR “centre for disease control” OR “Ministry of Health” OR “Department of Health”) AND (“essential public health function*” OR “essential public health operation” OR “essential public health service” OR “health system strengthening” OR “health system* resilience” OR “global health security” OR “health security” OR “six building blocks” OR “emergency preparedness and response” OR “emergency preparedness” OR “outbreaks” OR “pandemics” OR “epidemics” OR “public health emergency” OR “international health regulations” OR “international health
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To guide the data collection and screening, the inclusion criteria were:

- documents relating to NPHIs or equivalent entities in Africa;
- documents relating to health system resilience, health system strengthening and/or the EPHFs within the African context;
- documents in English, Spanish, Portuguese, Arabic and French; and
- documents issued between 2002 and 2022, so as to include material relevant to severe acute respiratory infection (SARS), H1N1 influenza, Middle East respiratory syndrome (MERS), Ebola virus disease and COVID-19, as well as the establishment of the International Association of National Public Health Institutes in 2002.

The exclusion criteria were:

- national level documents relating to NPHIs or equivalent entities from non-African countries, and
- documents issued before 2002.

To guide this review, a set of criteria was used to map and present the regional landscape of NPHIs (Fig. 1) and a conceptual framework was used to define the scope of NPHI activities in terms of their consideration of the EPHFs and contribution to health system resilience (Fig. 2). A set of guiding questions (Annex 1) were also used to expand on the objectives of the review. Fig. 3 shows the flow diagram of the number of records identified, included and excluded in the screening.

Fig. 1. Criteria for mapping NPHIs within the African region
NPHIs: national public health institutes.
**Methods**

**Fig. 2. Scope of activities of NPHIs in terms of their consideration of EPHFs and contribution to health system resilience**

NPHIs: national public health institutes; EPHFs: essential public health functions.

![Diagram showing the scope of activities of NPHIs](image)

**Fig. 3. Flow diagram of the number of records identified, included and excluded in the screening**

- **Identification**: Records identified through scientific databases searches (n = 1193) and Additional records identified through grey literature (n = 101).
- **Screening**: Total records after duplicates removed (n = 1294).
- **Eligibility**: Titles and abstracts screened (n = 1294) and Abstracts excluded based on defined criteria (n = 1168).
- **Included**: Full-text articles assessed for eligibility (n = 126) and Documents excluded based on defined criteria (n = 54).
- **Included**: Documents included in final review (n = 72).
4. Key findings

4.1 Regional mapping of public health institutes

4.1.1 Presence and distribution of NPHIs

The importance of NPHIs is increasingly recognized, particularly in the face of growing public health threats in the African region. This recognition has resulted in more countries establishing new NPHIs in the past two decades (8,9). As of April 2022, 37 of the 54 African countries have NPHIs, with 11 in West Africa, 10 in East Africa, 6 in Southern Africa and 6 in North Africa in Central Africa, (Fig. 4). From a subregional perspective, this means that 85% of West African countries, 71% of East African countries, 44% of Central African countries; 67% of North African countries and 67% of Southern African countries have NPHIs.

The rationale behind the establishment of NPHIs as dedicated public health entities within the African region varies. For example, some NPHIs were formed as an immediate response to a public health event that highlighted a need for specific capacity or leadership and coordination within health systems; others were formed following national public health reforms (9). For example, several NPHIs, such as the Burkina Faso, Liberia, Nigeria and Somalia NPHIs were established in the aftermath of the West Africa Ebola outbreaks in 2014–2016 (4,10), while others (e.g. Uganda) were established due to the growing need to consolidate public health functions under one roof and streamline coordination for optimal health outcomes (11).

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4.1.2 NPHI governance, including their enabling legislation and policies, financing and human resourcing for the institution

Some NPHIs report directly to their ministry of health while others exist as autonomous government agencies, with a certain degree of independence to effectively exercise their mandate (9). Various models and combinations of arrangements were identified, without clear classifications or distinctions. For example, NPHIs in Algeria, Angola and Burundi report directly to their respective ministries of health and the Ethiopia Public Health Institute is considered autonomous, while the remaining accountable to the ministry of health. Algeria’s NPHI is classified as a public administrative institution with a legal status and financial autonomy, and Burkina Faso’s NPHI is a moral and legal identity with administrative and financial management autonomy. Cabo Verde’s NPHI has administrative, financial and patrimonial autonomy, while Zambia’s NPHI is classified as an independent institute with a legal mandate that functions as a statutory body under the health ministry.

Other NPHIs such as the Somali NPHI exist as a semi-autonomous parastatal governmental public health agency with financial, administrative and technical independence. Uganda, as of
2020, was solidifying plans for legislation to enable its NPHI to become an official autonomous government entity (11). The National Public Health Institute of South Africa Act 1 of 2020 also intends to establish the NPHI of South Africa to coordinate and, where appropriate (given the existence of the National Institute for Communicable Diseases of South Africa), conduct disease and injury surveillance, and provide specialized public health services, public health interventions, training and research directed towards the main health challenges affecting the population (12).

Oversight of EPHFs within the region follows different models. In some countries, such as Liberia, some EPHFs are under the authority and oversight of a single NPHI, and other functions are directly under the stewardship of the ministry of health or other allied ministries. On the other hand, in some countries several public health entities are responsible for a range of EPHFs (13). For example, the Democratic Republic of the Congo has a number of institutions – Institute of Tropical Medicine, Institute of Biomedical Research and Kinshasa School of Public Health – that deliver different functions.

Many NPHIs are underpinned by legislative instruments that govern their establishment, operation and mandates; for example, through: national health acts (e.g. South Africa and Zambia); regulations (e.g. Ethiopia); executive decrees (e.g. Algeria, Angola, Burundi, Cabo Verde, Burkina Faso and Sudan); and accelerated enactment of legislation with presidential backing (e.g. Liberia). A few of these legislative instruments governing NPHIs explicitly consider health system resilience. For example, the Kenya National Public Health Institute Order, 2021 outlines a comprehensive coverage of the EPHFs that the NPHI’s mandate covers, including integrating population-based services in clinical settings and the promotion of equitable health services (14). Liberia’s Investment Plan for Building a Resilient Health System (2015–2021) was a multiyear national strategy which also advocated for and supported the establishment of an NPHI as part of the requirements for building resilience. This was after the 2014–2015 Ebola virus disease outbreaks, and the resultant widespread acknowledgement of the need for strengthening public health capacity as one of the key actions to build health system resilience.

There was consistency across many of the legislative and policy instruments (i.e. regional and national policies, plans, strategies, legislation and decrees) for establishing NPHIs in that they centred round the need for a coordinated approach to public health capacity strengthening (12,14,15). This common narrative included acknowledgement of the need for improved multisectoral coordination and an integrated approach that brought together stakeholders within and outside the health sector to enhance public health capacities. The role of senior leadership has also been noted as complementary to enabling legislation and policy frameworks. Political will and commitment of leadership at the highest level were reported as critical to establishing an NPHI and long-term investment from both high-level leadership and the individuals and groups that comprise the NPHI is essential (13).

Limited information is available on the human resources and funding sources of NPHIs. For most NPHIs, government appropriations are a major source of financial support (13). Other than Liberia’s investment plan, detailed information about the funding sources of NPHIs was limited. Madagascar was one of the few countries that explicitly mentioned funding sources such as diagnostic and vaccination activity and grants from private and public organizations (16). Africa CDC highlights the need for NPHIs to have multiyear strategic plans, detailing the current and future activities and needs, to allow for forecasting needed resources and as the basis of planning
how to secure these resources (13). A highly motivated, well trained and stable workforce is necessary for NPHIs to conduct public health functions efficiently and effectively (17). The best practices series of the International Association of National Public Health Institutes emphasizes that adequate human resourcing and retention are critical to the effective functioning of NPHIs (17). Another source also highlighted that adequate levels of staffing, training, skills and competencies, and experience in programme management, resource mobilization and financial planning were required for NPHI success (9). The International Association of National Public Health Institutes outlines the need for NPHIs to have regular engagement with the ministers of health and finance and other ministers to help clarify general considerations about the costs and benefits of NPHIs and potential availability of sources of funding (18).

4.1.3 Support of NPHIs by regional and global organizations and networks

Collaborative partnerships and networks are being used to strengthen public health institutions (9) by facilitating the sharing of resources and expertise (19). These collaborations have been reported within or beyond the region as a cluster network of institutes or as bilateral engagement between countries. Some examples include a technical exchange programme between the United Kingdom of Great Britain and Northern Ireland and South Africa that benefitted both countries by promoting a reciprocal exchange of information, skills and advice (19).

Regional bodies within the African region such as the Africa Union and the WHO Regional Office for Africa have been supporting their Member States in strengthening their public health capacities. As a specialized institution of the African Union, Africa CDC supports countries to develop and strengthen NPHIs (7,13) as a critical component of its strategy to implement five strategic pillars for improving public health in Africa. Part of Africa CDC’s scope includes dedicated support of research which aims to address priority health issues and strengthen public health research capacity within public institutions in Member States (20). The WHO Regional Office for Africa has also utilized the presence of WHO country offices and the role of WHO as the lead United Nations agency for global health as well as partnerships with other global health actors (e.g. US CDC, ministries of health and the United Kingdom of Great Britain and Northern Ireland Government3) to support countries within the region in strengthening their public health capacities (21).

Africa CDC, for example, established five regional collaborating centres strategically situated in five regions of Africa (22) to serve as hubs for surveillance, preparedness and emergency response at national and supranational levels. The use of regional networks to strengthen NPHIs uses a structural cooperation approach that utilizes the resources and capacity of partnerships and States. WHO collaborating centres within the African region have also supported countries in various public health capacities. For example, the Institut National de Recherche Biomédicale in the Democratic Republic of the Congo has a dual role of being an NPHI and a WHO collaborating centre for reference and training on diagnosis of human African trypanosomiasis (23). WHO has also supported NPHIs in Ethiopia and Liberia (24) to strengthen public health capacity and health system resilience, including by promoting the integration of health system resilience in the institutional priorities.

Similarly, the US CDC works closely with public health institutions in Egypt in collaboration with

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3 Public Health England’s IHR strengthening project was a £ 16 million project funded by the Department of Health and Social Care, Official Development Assistance (2016/2017–2020/2021) (21). It was designed to support certain vulnerable countries to better prevent, detect, assess and respond to public health incidents by building public health technical capabilities to enhance compliance with the requirements of the IHR 2005.
the Naval Medical Research Unit No. 3 (NAMRU-3) to utilize country and regional resources to control and combat priority infectious diseases through the establishment of a global disease detection regional centre (25). The International Association of National Public Health Institutes has supported NPHIs within Africa since its establishment in 2002 by: fostering a network of support and peer learning (Box 2) to enable the sustainable development of public health institutions and mobilizing the experience of its members to support each other, especially when making difficult choices in resource-constrained settings (9). The overarching aim of the International Association of National Public Health Institutes is to strengthen government agencies responsible for public health. Based on reports from the 2012 Bellagio Meeting published by the International Association (27), with input from various global health experts, NPHIs are the foundation of public health practice in numerous countries.

4.2 Scope of NPHI activities in relation to the EPHFs and contribution to health system resilience

Variation in the scope of NPHI activities across the world has been reported (9,19), although surveillance, health emergencies management, disease prevention programmes, research, laboratory systems and health workforce training are consistent across different NPHIs (4,10), and as indicated in Annex 2 and Annex 3. Different entities have proposed lists of EPHFs as guidance for NPHIs. For example, Africa CDC has provided a list of various EPHFs that are important for coordination and delivery under NPHIs (Fig. 5). From this list of 10 functions, public health laboratory and surveillance systems, emergency preparedness and response, public health workforce development, and public health research were noted as critical (13). Furthermore, WHO conducted a cross-mapping analysis of EPHF frameworks from its regional offices, from which a common list emerged (Box 1 and Fig. 5). The International Association of National Public Health Institutes also developed a list of EPHFs for NPHI consideration as part of their scope and cited three priority EPHFs: evaluation and analysis of health status; public health surveillance, problem investigation, and control of risks and threats to public health; and public health research. A cross-map of the Africa CDC list of priority functions with those of the WHO common list and the core list of the International Association of National Public Health Institutes shows complementarity, as shown in Fig. 5.
### WHO's common list of EPHFs (2)

- Monitoring and evaluating the population's health status, health service utilization and surveillance of risk factors and threats to health
- Managing public health emergencies
- Supporting efficient and effective health systems and multisectoral planning, financing and management for population health
- Assuring effective public health governance, regulation and legislation
- Protecting populations against health threats, including environmental and occupational hazards, communicable disease threats, unsafe food, and chemical and radiation hazards
- Promoting prevention and early detection of diseases, including noncommunicable and communicable diseases
- Promoting health and well-being and actions to address the wider determinants of health and inequity
- Ensuring community engagement, participation and social mobilization for health and well-being
- Ensuring adequate quantity and quality of the public health workforce
- Assuring quality of and access to health services
- Ensuring equitable access to and rational use of essential medicines and other health technologies
- Advancing public health research

### Africa CDC's core priority EPHFs for NPHIs (13)

- Population health and health-related indicators
- Evaluation, prevention, and control of public health issues in clinical settings
- Public health laboratory and surveillance systems and emergency preparedness and response
- Policies and plans supporting individual and community health efforts
- Health protection and support for regulation and enforcement
- Disease prevention and health promotion
- Advocacy, communication and social mobilization
- Public health workforce development
- Evaluation and promotion of equitable access to services
- Research in public health

### IANPHI's list of EPHFs for NPHIs (7)

- Public health surveillance, problem investigation and control of risks and threats to public health
- Evaluation, prevention, and control of public health issues in clinical settings
- Reduction of the impact of emergencies and disasters on health
- Planning and management
- Regulation and enforcement
- Prevention programmes and health promotion
- Social participation in health
- Human resources development and training
- Evaluation and promotion of coverage and access to health services
- Quality assurance in personal and population-based health services
- Public health research

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**Fig. 5. Cross-mapping of the EPHF lists of WHO, CDC Africa and IANPHI**

EPHFs: essential public health functions; WHO: World Health organization; CDC: Centers for Disease Control; NPHIs: national public health institutes; IANPHI: International Association of National Public Health Institutes.

The scope of functions and activities of NPHIs has also been noted to vary depending on their maturity, with new NPHIs (e.g. Kenya, Malawi, Uganda and Zambia) having a broader scope adopting a holistic approach to public health system strengthening (Annex 2) (4). Annex 2
and 3 provide summaries of the EPHFs covered within the scope of activities of NPHIs in the region. The EPHFs covered are skewed towards health emergencies with fewer on other public health programmes such as noncommunicable diseases or the wider determinants of health. The NPHIs in Kenya and Mozambique show some attempts to integrate broader characteristics of health system strengthening within their scope, such as community engagement, social and other determinants of health, and equitable integrated health service delivery.

4.2.1 Consideration of the EPHFs in national, regional and global frameworks, legislation, policies and plans for NPHIs

At the global level, the World Health Assembly resolution WHA69.1 emphasizes that strengthening EPHFs contributes to health system resilience, which is critical for the attainment of UHC (28). This resolution provides a global policy direction for national authorities and their institutes to put in place national policies to strengthen their public health capacities for resilience through an integrated approach. At the regional level, several WHO regional resolutions have also provided strategic framework for countries to anchor their national efforts (2,29). The African Union’s Africa agenda 2063: a roadmap for the development of the continent also provided a regional strategic framework and rationale that led to the establishment of the Africa CDC in 2017 (30) and shaped Africa CDC’s visibility, public health mandate and scope of activities across the region.

At the national levels within the region, NPHIs are guided by legislation in the form of, for example, acts, decrees, orders and statutory instruments, some of which provide a specific explanation of and guidance on the function, role, mandate and authority of the NPHIs (14,15,31). For instance, the legislative order for the establishment of the Kenyan NPHI states that its mandate includes: disease prevention and health promotion activities; advocacy, communication and social mobilization; promotion of equitable health services and public health services in clinical settings; as well as the traditional functions of surveillance, laboratory systems, emergency response, public health workforce training and research (14). Moreover, in cases where the legislative framework exists and includes consideration of the EPHFs, the older and more traditional NPHIs appear to have a more focused and specific mandate on health security functions, whereas newer NPHIs (e.g. in Zambia and Kenya) appear to include more health system strengthening functions within their scope. Some consideration has been given to individual public health functions in national health (or allied) sector policies and plans (Ministry of Health, Zambia), with notable examples in health promotion, surveillance, detection and response to communicable and noncommunicable diseases, emergency preparedness and response, and health workforce development. The Zambian National Health Strategic Plan (2017–2021) acknowledges that Zambia’s public health system functions through the activity of different ministerial directorates and external partners and that this fragmented approach weakens the national capacity to effectively deliver the EPHFs (15).

4.2.2 Enabling of NPHIs to promote an integrated approach to public health

The International Association of National Public Health Institutes developed a best practices toolkit with several thematic areas which present the enabling environment needed for NPHIs. These enablers include: best practices and guidance on legal mandates and governance (32); establishing an NPHI foundation (33); mentorship (34); building a business case for NPHI

4 The IANPHI mentorship programme entailed more experienced global health individuals giving guidance to a younger professional from member countries
creation (18); NPHI staff retention (17) (Box 3); recruiting an NPHI director (35); and peer-to-peer visits (26). These best practices are also a form of joint learning, sharing and collaborating among NPHIs in different countries.

Furthermore, various frameworks developed for NPHI development have identified and emphasized key enablers such as strong leadership and government commitment in prioritizing financial, infrastructure and workforce support (13). Another enabler is sustained relationships and data sharing between NPHIs and agencies not traditionally considered strong public health actors, e.g. agencies responsible for ports of entry (8).

Supporting subnational public health entities (at state/provincial and local levels) is considered critically important, through provision of funds and personnel (e.g. training, staffing or short-term and long-term staff deployment from the NPHI) to increase operational capacities (36). Engagement of NPHIs with subnational health entities takes several forms, such as health workforce training, community engagement initiatives and sentinel-based surveillance. In Madagascar, the NPHI has an extensive sentinel surveillance programme that includes 72 sites (54 basic health centres in 35 health districts and 18 hospitals) and involves the collaboration of 107 community health workers.

Multisectoral coordination is another important enabler of success for NPHIs as it fosters an integrated approach to health system strengthening with consideration of public health (Box 4). NPHIs in the region have reported collaborative work and projects with different stakeholders that are within the health sector or with allied sectors. One example is the Uganda NPHI which has a dedicated project called Data 4 Health – a civil registration and vital statistics project – which is a multisectoral initiative between the NPHI, Ministry of Health and Ministry of Internal Affairs. This sets an example of the multisectoral aspects of public health and the need to better integrate and coordinate public health activities necessary to address important public health problems.

4.2.3 Monitoring and evaluation of EPHF implementation

Within the region, there is limited evidence of comprehensive and holistic monitoring and evaluation mechanisms for NPHIs’ capacity for the implementation of EPHFs. The International Association of National Public Health Institutes proposed the staged development tool

Box 3. Good practices and lessons: public health workforce retention

The International Association for National Public Health Institutions has developed guidance on best practices for the retention of personnel in national public health institutions (NPHIs), harnessing experiences from NPHIs around the world (17). NPHIs should: develop opportunities for personal and professional development; foster a collective sense of purpose and organizational pride; consider compensation enhancements; ensure a supportive work environment and systems; and match the public health workforce to population health needs.

Box 4. Good practices and lessons: One Health approach with multisectoral coordination

The increased drive and political will to implement the One Health approach in Africa, particularly in preparedness and response to zoonotic diseases, has already improved Lassa fever surveillance and control in West Africa (37). This approach can be scaled up and adopted in wider public health efforts to build health system resilience and include stakeholders from allied sectors (38).
to evaluate NPHIs’ current capacity. The tool has 28 areas, each with three steps – assess, prioritize and plan. This approach aims to identify the problem in each area and its potential solutions (39,40). In addition, a peer-to-peer evaluation scheme to develop relationships between institutes and inform shared learning was also identified (41). Some public health functions, such as health workforce, disease prevention and health promotion (e.g. immunization activities), are monitored through routine health information systems such as District Health Information Software (42), while other functions are monitored through other complementary assessments mechanisms. Some of these complementary assessments include the IHR 2005 monitoring and evaluation framework which has the State Party annual assessment, joint external evaluations, and intra and after action reviews (43) that assess national capacities in several functions such as emergency preparedness and response, and surveillance. These mechanisms also indicate NPHI capacity to deliver the respective functions. In addition, programme-specific assessment mechanisms also exist, for example, on health promotion, access to health services and access to quality medical products.

Africa CDC highlights several key characteristics to foster effective NPHI accountability mechanisms. These are shown in Box 5.

Another valid tool that can be used to monitor and evaluate NPHIs’ capacity is the EPHF self-assessment tools for countries. While the WHO Regional Office for Africa does not have its own tool, various frameworks have been created by other regional offices to evaluate the EPHFs of the health systems of their Member States’ (44-47). While these frameworks can provide an in-depth analysis of functions and can find weaknesses in systems, they have several limitations. First, the analysis is valid within the time of the assessment, which means it may be influenced by cultural dynamics or political or institutional environments. Second, fragmentation or issues with specificity may exist that should be adjusted for the specific demographic. Overall, these tools are only successful if they are integrated into decision-making and are used regularly (29).

Some lessons from the European region have been noted on the assessment of the EPHFs. These include: challenges with engaging national leaders in efforts to improve population health; time commitment necessary to complete the assessment as a potential barrier; and general challenges related to the work burden and the effective dissemination of results to policy-makers (48). Further, reflections on evaluation of EPHFs from the South East Asian region and Eastern Mediterranean region have identified good practices, as reflected in Box 6.
5. Discussion

5.1 Regional mapping of public health institutes in Africa

The growing presence and distribution of NPHIs within the region highlight the efforts of countries to coordinate EPHFs by developing institutional coordination to better strengthen health system resilience. Momentum has increased for the establishment of NPHIs, particularly in the wake of public health events, with efforts to better harmonize public health capacities. The absence of a public health institution, however, does not necessarily infer a lack of public health capacities or efforts as some countries still oversee these functions under the Ministry of Health and other agencies. The method of coordinating public health functions is strongly linked to the context of a country and establishing NPHIs requires resources, with sustainable funding, which may not always be available.

The technical and operational mandate of NPHIs allows them to provide good-quality, evidence-based advice, thus reducing bias and conflict of interest driven by political ideology or financial incentives. The different levels of autonomy of NPHIs in Africa have advantages and disadvantages, and decisions to develop new NPHIs or review existing NPHIs need to be based on an analysis of existing public health infrastructure, capacities, set-up and context, and population health needs assessment. As the implementation of EPHFs requires a multisectoral, whole-of-government approach, autonomy and independence would also enable NPHIs to work and coordinate better with other ministries to strengthen health system resilience, without the complexities of reporting lines, budgets and mandates.

Privatization of the coordination of EPHFs (as in the case of the Madagascar NPHI) has yet to be fully understood and explored, particularly how this would affect equitable distribution and delivery of population-based services. The definition and scope of the EPHFs generally include activities that are broadly the responsibility of the State and not enough research has been...
done on how a private institution would coordinate with the public sector and ministries in the delivery of key functions necessary for the health and well-being of the public. The governance arrangements of a private entity in coordinating with State sectors in the multisectoral delivery of EPHFs are also worth exploring further. It is also worth exploring whether the financial and political autonomy of a critical entity is what is required to effectively ensure the sustainability of its efforts. In addition, the benefits of the different administrative arrangements should be considered, bearing in mind contextual differences between and within countries.

Sustainable financing and human resourcing of NPHIs as an institution requires developing approaches for working with the Ministry of Health, Ministry of Finance and other ministries and legislative bodies, and utilizing any external partnerships and donor relationships. This is particularly important for the research function of NPHIs, where obtaining research funding often requires a track record of success and sustained collaboration with established research organizations. Institutional retention of staff in the African setting has common challenges, such as limited funding for adequate incentives and remuneration (17), which has resulted in a high turnover of NPHI staff, thus depleting the retained institutional memory needed to support the country.

Successful implementation of any public health programme requires an adequate, good-quality and competent workforce at the operational level. Most NPHIs have acknowledged and supported this need and have health workforce development as part of their public health functions. This has helped improve public health competencies in the health workforce and hence wider operational capacities, particularly at the subnational level where implementation and delivery of services occur. A missed opportunity however has been the narrow scope of capacity-building of the workforce, which seems to be limited in epidemiology with limited consideration of health system functions and resilience within the framework of the EPHFs. Furthermore, given the significant numbers of African health workers who leave their countries to work elsewhere (the so-called brain drain), the role of NPHIs in mitigating the factors pushing migration of the public health workforce is very important. Opportunities exist for NPHIs to work together with public health schools and regional and global associations of public health professionals to create conducive working environments and help retain and develop a critical mass of public health workers who meet national and regional needs.

Recognition that national capacity alone is insufficient to ensure adequate preparedness for infectious disease outbreaks has been growing, particularly for those of international concern. While NPHIs operate at a national level, in recent years, international networking and partnerships have increased, with structured peer-to-peer support, which have led to improvements in many collaborating organizations (9). In addition, the pooling of certain public health capacities (such as biosafety level 3 and 4 laboratory services) has proved to be a more cost-effective approach, particularly in supporting smaller countries that would otherwise not have the financial resources to develop such costly capacities alone.

Furthermore, the establishment of regional institutes such as the Africa CDC is based on the same premise – that a united, collaborative approach is needed to build regional capacity for public health in addition to the national capacity strengthening. This has been complemented by the support provided by the WHO Regional Office for Africa in the region in building public health capacity, as reflected in the Africa CDC and WHO memorandum of understanding focusing on emergency preparedness in order to strengthen the region’s defences against epidemics.
and other health emergencies (51). While a great deal of support exists for strengthening the different public health functions (Box 7), more can be done to promote effective coordination to foster an integrated approach to the delivery of these functions.

The influence of regional cooperative bodies and their specialized agencies on the scope and structure of NPHIs within the region is of interest. The Africa CDC has five strategic pillars guiding its vision, mission and support to countries; these are limited to: surveillance and epidemic intelligence; emergency preparedness and response; and laboratory systems and networks. A cross-map of lists of EPHFs proposed by Africa CDC, the International Association of National Public Health Institutes and WHO, as part of their guidance on the scope of NPHIs showed alignment and complementarity (Fig. 4), which helps provide a unified message and guidance to countries within the region. However, it is worth noting that insufficient evidence exists on the links between the guidance lists provided by these regional and global entities and those adopted by different NPHIs within the region. Moreover, a significant number of the NPHIs predate the release of the suggested core functions. When evaluating Africa CDC’s framework on the development of NPHIs and the framework of the International Association of National Public Health Institutes (7), this coherent message is clear. A unified message is particularly important when different regional bodies are supporting countries in strengthening their public health capacity and including institutional support to NPHIs or the ministry of health.

5.2 Scope of NPHI activities in relation to the EPHFs and contribution to health system resilience

Recent public health emergencies, such as the 2014–2015 West Africa Ebola virus disease outbreaks and ongoing COVID-19 pandemic, have highlighted the deficiencies in the public health focus and orientation of health systems and motivated governments to prioritize public health. While emergencies may be an important incentive, history has shown that NPHIs formed as an immediate response to a public health event can have a narrow focus on health security rather than on the wider EPHFs which contribute to building health system resilience. In a world that faces a broad range of public health challenges, including infectious diseases, noncommunicable diseases, antimicrobial resistance, climate-related events, and war and conflict, a more systems-oriented approach to the EPHFs within public health institutes is needed, to ensure countries have sufficient capacity in all critical dimensions of public health, instead of just a narrow subset of functions.

While some EPHFs come under the scope of NPHIs, ministries of health and other allied ministries also play an important role in providing oversight and delivery of EPHFs. The criteria
used to ascertain which of these functions should fall under NPHIs and which under the health ministry (in countries with both institutional arrangements) are an area of interest but data are insufficient to support this review. The argument is less about which functions sit where, but rather about how the different functions in different authoritative sectors can be coordinated effectively to contribute more sustainably towards health system resilience.

In the wake of COVID-19, the NPHIs played a critical role in adapting their scope and mission, addressing challenges and delivering the EPHFs, while working on the frontline of pandemic preparedness, readiness and response (54). This experience has contributed to: the evolution of NPHIs into stewarding, coordinating and strengthening public health capacities; the use of a scientific basis for their advice; and their accountability to their respective governments. They have also had to balance these new roles with their mandate in emergency response efforts. From a global perspective, several lessons emerged from the experiences of NPHIs with COVID-19, which may also apply to the African context (Box 8).

The COVID-19 pandemic has changed the public health infrastructure within the region; countries enhanced their laboratory capacity and workforce and used technological advances to make efficient surveillance systems (8). Within subnational public health infrastructures, data collection on transmission was improved, decentralized laboratory capacity was expanded and greater community engagement was achieved (8). In addition, NPHIs had greater visibility within government agencies, and partnerships were created (8). Much of the enhanced capacity achieved during the COVID-19 pandemic is expected to persist beyond the pandemic (8).

The scope of functions and activities in NPHIs varied within the region, with the older NPHIs having a more traditional approach and the newer ones having a more comprehensive system-wide approach (4). This difference may be due to the growing evidence and lessons learnt from recent emergencies that highlighted the value of public health in health system strengthening. Newer NPHIs seem to place equal importance on activities that enable the integrated and systems approach to building resilience, including critical functions such as community engagement and risk communication, and embedding and maintaining population-based services with individual curative services in all contexts. This approach needs effective links between NPHIs and other parts of the public health system to fulfil these EPHFs (9). In addition, the multisectoral, whole-of-society approaches are more evident and appreciated than before and have transformed the organizational structures, functions and activities in the newer institutions. The choice in the scope of activities can be attributed to the mandate given through global, regional and national policy and/or other legislation governing the establishment of the NPHI. Global and regional

Box 8. Global lessons learnt on the roles, responsibilities and positions of NPHIs in the context of the COVID-19 response

- A clear role and scope of functions of the NPHI, including with reference to other national stakeholders, is essential for managing crises.
- A clear and mutually agreed understanding of the relationship between policy-makers and NPHIs is needed, particularly in responding to health emergencies.
- Long-standing relationships, partnerships, practical connections and effective communication channels between NPHIs, government and other stakeholders have been important in coordinating emergency responses.
- Prioritizing multisectoral, multilevel and collaborative approaches as part of emergency preparedness and response planning is essential.
policies play a fundamental role in shaping national direction on institutional arrangements for public health. While different global actors support African countries to set up and sustain NPHIs, WHO, as the lead for global health, together with other global actors need to provide more support to countries in enhancing their institutional capacity to build health system resilience. When underpinned by enabling legal and policy instruments, and sufficiently resourced, NPHIs are well placed to systematically address weaknesses in public health capacity of health systems, including IHR 2005 compliance, through the comprehensive delivery of the EPHFs and potential for cross-sectoral linkages (9).

At the national level, multiyear health sector plans provide an opportunity to ensure country ownership, priority-setting and alignment with population health needs. Through these policies and plans, EPHFs can be mainstreamed and incorporated into health system strengthening frameworks that can guide health authorities in collaboration with the community and the different agencies within and outside the health sector (55). This approach would also help guide operational planning and implementation for both individual and population-based health services. The traditional approach to health system planning has involved a narrow and siloed focus on individual-based care and services, with very limited scope for population-based services. However, without population-based services, the whole system is not resilient to emerging shocks.

Focusing on strengthening health systems through the EPHFs (56) has the potential to prioritize public health in national health sector policies, strategies and plans. However, very few plans and guidance currently exist on how to effectively promote and deliver the EPHFs within the NPHI structure. To better integrate EPHFs in wider health system strengthening, all the following elements are needed: greater political commitment, visibility and institutional arrangements to coordinate EPHFs; population needs assessment and risk profiling; multisectoral accountability for goals; and assessment of EPHF provisions and workforce for delivering the EPHFs (2). In relation to workforce capacity building, WHO has developed a roadmap for national workforce capacity to implement essential public health functions (2) based on its updated global list of EPHFs to ensure a holistic coverage of public health skills and competencies at country level (57).

To support prioritization of EPHFs may require greater engagement and improved relationships with national decision-makers in setting reform priorities and the reformulation of EPHFs within different policy instruments to gain support from other public health organizations (57). It is also important to contextualize and define the EPHFs and their subfunctions in line with national and subnational settings. This can help identify relevant stakeholders within and outside the NPHI and the national public health set-up in order to deliver public health functions and activities with improved effectiveness, efficiency, monitoring and accountability.

While monitoring of the different public health programme areas and functions may be necessary, it is alignment across the different efforts that is important to ensure coherence in decision-making and actions. Parallel approaches to the monitoring of an individual function or cluster of functions without alignment will lead to and perpetuate fragmentation in these assessments and in the use of the evidence to inform an integrated policy shift. EPHFs as an integrated approach to health system strengthening provide a much-needed opportunity to harmonize various public health assessments towards unified evidence generation and subsequent transformative decision making. Ongoing efforts within the region, with the support of the WHO Regional Office for Africa, to integrate monitoring of public health functions
(e.g. integrated disease surveillance and response) in routine health information management systems show good progress.

6. Conclusion

In the face of emerging and evolving public health challenges of various types, there is a growing need to enhance the coordination of EPHFs to improve and strengthen health systems. Lessons from the COVID-19 pandemic continue to show that the world cannot afford to keep on with fragmented approaches to public health. National authorities and their partners should systematically appraise the public health consideration and orientation in their policies, planning, infrastructure and services, and embark on building better, fairer and more resilient health systems for all and in all contexts.

Several lessons and good practices from the African region and beyond can inform a renewed perspective on strengthening institutional capacity for public health, in relation to policy, planning and implementation in health systems. The role of global institutions will remain a key to fostering collaboration, transferring knowledge and good practices, and promoting an integrated approach to building health system resilience with a focus on public health. With the support of regional and global partners and networks, the ongoing political impetus generated by the COVID-19 pandemic presents an opportunity for the African region and its countries to apply the lessons learnt in building back stronger institutional capacity for and stewardship of public health.

Despite the various forms that public health stewardship may take due to contextual differences, the need for an integrated approach remains. It may be that a dedicated entity with a clear mandate would be better placed to coordinate and facilitate the delivery of EPHFs. However, what is important is for health and allied sectors to ensure integrated and comprehensive delivery of EPHFs to effectively and efficiently meet population health needs, and strengthen health systems resilience in the 54 countries in Africa.
References


# Annex 1. Guiding questions used to frame the review

<table>
<thead>
<tr>
<th>Objective</th>
<th>Example guiding questions</th>
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</table>
| 1. Mapping regional public health institutes | • What is the current presence and distribution of NPHIs within the region?  
• What type of governance and leadership structures are used for NPHIs within the region, including their enabling legislation and policies, and financial and human resources?  
• What role do regional and global bodies and networks (e.g. IANPHI, African Union and Africa Centre for Disease Control) play in supporting NPHIs achieve their public health mandate? |
| 2. Elucidating the scope of activities and the EPHFs of NPHIs, including their contribution to health system strengthening and resilience at the country level | • Are EPHFs considered in health system strengthening in the relevant national and/or regional plans, policies and legislation?  
• To what extent do the existing inputs and set-up allow NPHIs to promote a holistic, integrated approach to public health using an EPHF perspective?  
• Do the NPHIs have clearly defined links with other stakeholders (e.g. health services and the animal sector for population-based health services)?  
• How are health systems and services oriented to deliver and maintain population-based services?  
• Are there defined mechanisms for monitoring and evaluating the capacity of NPHIs for EPHFs, and how do NPHIs ensure integration and alignment of public health-related assessments, particularly in identifying gaps in existing public health functions and capacities at the national and subnational level? |
| 3. Identifying good practices and lessons on the role of NPHIs in health systems strengthening across the region | • What notable good practices, opportunities and/or gaps can be learnt from countries to inform priority-setting and policy actions in the African region? These can be in terms of: policies and legislation; enabling inputs and infrastructure; public health service provision; and monitoring and evaluation. |

NPHIs: national public health institutions; IANPHI: International Association of National Public Health Institutes; EPHF: essential public health functions.
# Annex 2. National public health institutes in Africa and their prioritized EPHFs

<table>
<thead>
<tr>
<th>Country</th>
<th>Name of the NPHI</th>
<th>Year established</th>
<th>Website/source</th>
<th>Prioritized essential public health functions</th>
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<tr>
<td>1 Algeria</td>
<td>Institut National de Santé Publique (INSP)</td>
<td>1964</td>
<td><a href="https://www.insp.dz/index.php/Non-categorise/mis-sions.html">https://www.insp.dz/index.php/Non-categorise/mis-sions.html</a></td>
<td>• Health information and communication • Disease control and prevention • Health promotion and protection • Public health research and training</td>
</tr>
<tr>
<td>2 Angola</td>
<td>National Institute of Public Health</td>
<td>1981</td>
<td><a href="https://inis.gov.ao/">https://inis.gov.ao/</a></td>
<td>• Public health laboratories • Environmental health • Traditional medicine • Public health surveillance</td>
</tr>
<tr>
<td>4 Botswana</td>
<td>Botswana Public Health Institute (BPHI)</td>
<td>2018</td>
<td><a href="https://www.cdc.gov/globalhealth/countries/botswana/default.htm">https://www.cdc.gov/globalhealth/countries/botswana/default.htm</a></td>
<td>• Health information and communication • Public health surveillance • Public health laboratories • Public health workforce development • Emergency preparedness and response</td>
</tr>
<tr>
<td>6 Burundi</td>
<td>Institut National de Santé Publique (INSP)</td>
<td>1999</td>
<td><a href="https://insp.bi/">https://insp.bi/</a></td>
<td>• Public health research and training • Public health laboratories</td>
</tr>
<tr>
<td>7 Cabo Verde</td>
<td>Instituto Nacional de Saúde Pública (INSP)</td>
<td>2014</td>
<td><a href="https://www.insp.gov.cv/index.php">https://www.insp.gov.cv/index.php</a></td>
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| 8 | Cameroon            | National Public Health Laboratory (LNSP)                                       | 2013             | [https://lnsp-cam.org/](https://lnsp-cam.org/)         | • Public health surveillance  
• Public health laboratories                                                                 |
• Health service provision (in support of training and research)  
• Monitoring and evaluation of impact of public health programmes  
• Public health workforce development  
• Health information and communication                                                                 |
| 10| Democratic Republic of the Congo | Institute of Tropical Medicine; Institute of Biomedical Research; Kinshasa School of Public Health | 1984; 1984   | [https://inrb.net/](https://inrb.net/)                  | • Public health surveillance  
• Public health research and training  
• Public health workforce development  
• Public health laboratories                                                                 |
• Public health monitoring  
• Health promotion and disease prevention  
• Health information and communication  
• Emergency preparedness and response  
• Environmental and food safety                                                                 |
• Public health laboratories and biosafety  
• Public health research and training  
• Health information and communication                                                                 |
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<th>Website/source</th>
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<td>13 Ethiopia</td>
<td>Ethiopian Public Health Institute</td>
<td>1995</td>
<td><a href="https://ephi.gov.et/">https://ephi.gov.et/</a></td>
<td>• Public health laboratories&lt;br&gt;• Public health research and training&lt;br&gt;• Emergency preparedness and response</td>
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<td>14 Ghana</td>
<td>Disease Surveillance and Disease Control Departments, Public Health Division, Ghana Health Service</td>
<td>1979</td>
<td><a href="https://www.qhs.gov.gh/directorates/public-health-division">https://www.qhs.gov.gh/directorates/public-health-division</a></td>
<td>• Public health surveillance&lt;br&gt;• Emergency preparedness and response&lt;br&gt;• Strengthening of routine immunization</td>
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<td>15 Guinea</td>
<td>National Institute of Public Health (Guinea NPHI)</td>
<td>2019</td>
<td><a href="https://www.insp-guinee.org/">https://www.insp-guinee.org/</a></td>
<td>• Public health workforce development&lt;br&gt;• Public health research and training&lt;br&gt;• Public health laboratories&lt;br&gt;• Emergency preparedness and response</td>
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• Environmental and occupation health  
• Public health research and training |
• Public health monitoring  
• Health information and communication  
• Health promotion  
• Public health surveillance  
• Public health laboratories  
• Integrated health services |
| 20 Madagascar | Institut Pasteur de Madagascar | 1961 | [https://www.pasteur.mg/a-propos/](https://www.pasteur.mg/a-propos/) | • Public health laboratories  
• Public health research and training  
• Disease prevention and control  
• Public health workforce development |
| 21 Malawi | Public Health Institute Malawi (PHIM) | 2013 | [https://www.fhi.no/globalassets/dokumenter/filer/global-helse/ghpp/phim-newsletter_01.pdf](https://www.fhi.no/globalassets/dokumenter/filer/global-helse/ghpp/phim-newsletter_01.pdf) | • Public health laboratories  
• Public health surveillance  
• Public health research and training  
• Emergency preparedness and response  
• Disease prevention and control  
• Public health service delivery  
• Public health workforce development |
| 22 Mauritius | Mauritius Institute of Health | 1989 | [https://mih.govmu.org/mih/](https://mih.govmu.org/mih/) | • Public health research and training |
• Vaccines, therapeutics and diagnostics access and distribution  
• Public health laboratories  
• Food safety and environment services |
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### Annex 3. Cross-map of identified EPHFs in national public health institutes

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**Note:** The essential public health functions are: 1. Monitoring and evaluating the population’s health status, health service utilization and surveillance of risk factors and threats to health; 2. Public health emergency management; 3. Assuring effective public health governance, regulation and legislation; 4. Supporting efficient and effective health systems and multisectoral planning, financing and management for population health; 5. Protecting populations against health threats, including environmental and occupational hazards, communicable disease threats, food safety threats, and chemical and radiation hazards; 6. Promoting prevention and early detection of diseases, including noncommunicable and communicable diseases; 7. Promoting health and well-being and actions to address the wider determinants of health and inequity; 8. Ensuring community engagement, participation and social mobilization for health and well-being; 9. Ensuring adequate quantity and quality of the public health workforce; 10. Assuring the quality of and access to health services; 11. Advancing public health research; 12. Ensuring equitable access to and rational use of essential medicines and other health technologies.