A Review of Joint External Evaluations and National Action Plans for Health Security in 13 Countries from a Health Systems Perspective
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(Fostering resilience through integrated health system strengthening series)

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Preface

About this report and objectives

The aim of this report is to present a review of selected joint external evaluation (JEE) and post-JEE national action plans for health security (NAPHS) data from a health systems perspective, while acknowledging salient opportunities for health systems strengthening and health security integration with broader health sector planning efforts. The reviewed countries were Bangladesh, Ethiopia, Ghana, Kenya, Liberia, Malawi, Nigeria, Pakistan, Sierra Leone, South Sudan, Tanzania (United Republic of), Uganda and Zimbabwe. In addition, this report identifies facilitators and barriers captured within JEE and NAPHS for improving performance on five core capacities of IHR through an analysis of the 13 countries. This also allows to evaluate the feasibility of emerging country data from JEE for strengthening linkages between health security and health systems. Available national action plans for health security for these countries were reviewed, and facilitators and barriers to their implementation from a health systems perspective were also identified.

The findings inform subsequent phases of the project, including conducting further complementary analyses to ascertain the current state or intent of health systems strengthening and health security integration in health system strategies and documents in Bangladesh and Liberia; and convening a dialogue with relevant policy-makers on an integrated approach towards building more resilient health systems.

Target audience

The primary audience for this report is national and subnational health authorities, including the ministry of health, national policy and planning directorates, national public health institutes and subnational health management teams. This scope covers relevant humanitarian and development actors with a potentially important role in bridging humanitarian and development sectors for long-term health systems resilience with efforts in emergency preparedness.
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Abbreviations

AAR  after-action review
AMR  antimicrobial resistance
COVID-19 coronavirus disease
DRM  disaster risk management system
DSO  district surveillance officer
EOC  emergency operations centre
EPR  emergency response plan
EPRP emergency preparedness and response plan
FELTP Field Epidemiology and Laboratory Training Programme
FETP Field Epidemiology Training Programme
GHSA Global Health Security Agenda
IDSR integrated disease surveillance response
IPC  infection prevention and control
IT  information technology
JEE Joint External Evaluation
MOH ministry of health
MoU memorandum of understanding
NAPHS National Action Plan for Health Security
NMHPR national multi-hazard preparedness and response plan
PHEIC public health emergency of international concern
PHEOC public health emergency operations centre
PHIM Public Health Institute of Malawi
SDG United Nations Sustainable Development Goal
SIMEX simulation exercises
SPAR States Parties Self-Assessment Annual Reporting
TB tuberculosis
UHC universal health coverage
USAID United States Agency for International Development
Executive summary
Traditionally, health systems strengthening and health security efforts have taken “silied” approaches in national capacity development for health systems and health security, however, both are integral in the attainment of universal health coverage (UHC) and global health security, while in alignment with attaining the Sustainable Development Goals 3.

Recent and ongoing disruptive shocks and stressors have heightened the need for health systems strengthening and health security integration. These integration efforts should be underpinned by a whole-of-society and whole-of-government approach in order to enable the health system to mitigate risks, absorb the impact of events and maintain continuity of quality essential health services.

The International Health Regulations (2005) (IHR (2005)) Monitoring & Evaluation Framework enable countries to assess their core preparedness capacities and cross-border security threats. Moreover, previous public health emergencies have underscored the importance of, and built momentum to, strengthening health systems with essential public health functions, including capacities related to health security, as a primary line of protection and promotion for population health, well-being and the economy.

The aim of this report is to jointly analyse data from joint external evaluations (JEE) and national action plans for health security (NAPHS). These were obtained from a sample of 13 countries from a health systems perspective, considering the current national-level health policy, plans and practices; and to understand facilitators and barriers of implementing NAPHS in building resilient health systems.

**Key findings from JEE and NAPHS review**

- **Countries have policies, legislation and regulation** relating to IHR. However, these are often outdated, having been developed prior to the rollout of IHR (2005) in 2007, and are no longer adequately fit for purpose given the current challenges, including limited considerations for health systems and health security alignment.

- **Countries that have recently undergone public health emergencies are using experiences from previous emergencies, applying lessons** to inform broader planning efforts and set policy and strategic direction for the overall health sector in building back better. For example, Liberia and Sierra Leone are drawing on experiences from the Ebola outbreak, and Nigeria and Pakistan on their experiences with the polio eradication programme.

- **Sub-national implementation approaches** can improve or hinder effective preparedness and response. In Liberia, the critical role of the sub-national level in supporting response efforts is highlighted. In Ethiopia, missed opportunities to align policy and planning alongside operational action were highlighted.
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as a weakness for preparedness and contingency planning.

• Across all countries, JEE reports highlighted insufficient financial resources to implement necessary legislation and policies, which implies a need for allocation of resources for IHR (2005) implementation in the national budget for sustainability and mainstreaming of efforts in wider health sector programming and budgeting.

• All countries reported the existence of a human resources for health strategy. However, the focus of the strategy as reflected in the NAPHS and JEE reports, is often limited to human health, with little to no attention being paid to public health protection and the animal health workforce, which are under different authorities (such as Ministry of Agriculture; Ministry of Water and Sanitation), contributing to the limited alignment in efforts.

• It is essential to develop multi-hazard emergency preparedness and response plans. Although emergency preparedness and disaster plans exist in some form in some countries, they are siloed, disease-specific and sector-specific.

• The existence of an emergency operations centre (EOC) structure does not in itself ensure sector-wide coordination for timely health systems response. Many countries reported an established EOC. However, these were often not underpinned by clear protocols with chains of command, coordination and identified responsible parties, which reduces the centre’s effectiveness. Moreover, there was no clear designation of health systems focal points, particularly to oversee the maintenance of essential services and other health systems functions during emergencies.

• Close engagement with law enforcement and security agencies is reported in all countries, with clear mapping of stakeholders and available policies and plans to engage law enforcement and security agencies in public health emergency preparedness and response. One key bottleneck identified is the lack of protocols and standard operating procedures (SOPs) to support effective coordination and information-sharing between the law enforcement and security agencies with the health sectors.

Discussion and Key Areas for Consideration

Health systems resilience, being multifaceted and cross-cutting, requires close alignment and collaboration between various health and allied systems functions. IHR capacities, assessed

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i Kruk et al. (1) define health system resilience as the capacity of health actors, institutions, and populations to prepare for and effectively respond to crises; maintain core functions when a crisis hits; and, informed by lessons learned during the crisis, reorganize if conditions require it.
through JEE and further enhanced through the subsequent national action planning and implementation processes, could benefit from a wider system approach that integrates and aligns with other existing, yet complementary functions. For example, strengthening IHR capacities can be embedded in national health sector plans, and aligned with other allied programme specific plans, for sustainability of efforts.

Based on the overall syntheses of data, the following were identified as important priorities for consideration. These are cross-cutting priorities that are pertinent to the identified primary audience i.e. national and subnational health authorities, as well as humanitarian and development actors. Although a wider health systems perspective was applied in the overall analysis, the following summarised key areas were framed using the building blocks.

The report is not without limitations. Given the foundational scope of this activity with 13 countries, future work would benefit from expanding the number of focus countries to facilitate development of concentrate actionable next steps for specific stakeholders at country and global-level.

**Leadership and governance**

- Conduct a strategic review of the long term viability of currently siloed programmes and funding, for common gaps, synergies and resources for integrated systems security needs.
- Support an integrated, multisectoral approach to planning and unite, bridge and synergize parallel and complementary planning tools, efforts and investments through inclusive planning and review processes for both health sector and health security planning.
- Apply whole-of-society, multisectoral engagement between health systems and health security, building on the existing One Health approach, to ensure sustained and institutionalized coordination with a focus on subnational capacities.
- Place learning at the core of resilience efforts at all levels of the health system, including documenting and leveraging lessons learned from previous emergencies to inform recovery and subsequent preparedness efforts.
- Promote inclusion of JEE recommendations in the development of NAPHS and its implementation, with a dedicated focus on improving health systems and health security integration.

**Health financing**

- Promote resource mapping across multiple health sector and health security programmes, to foster integration and alignment and streamline technical and financial resources.
- Mobilize government resources to support health systems capacity-building for emergency management. This includes mandating local governments’ role and support; advocating for budgets to support
• public health systems; sustaining dialogue with and engagement of political and non-State actors; and supporting private-sector involvement.

**Health workforce**

• Strengthen the health workforce by improving availability, retention and distribution to improve equitable access to high-quality care.

• Ensure better alignment between health workforce and health security strategies, including investment in a workforce that can be responsive to the current and emerging needs of a country in the context of emerging epidemiology.

• Invest in and leverage the primary health care workforce to complement needs emanating from increased demands during public health emergencies.

**Essential medicines and commodities**

• Strengthen a coordinated supply chain management for essential medicines and commodities, health security planning, resourcing and capacity development.

**Health information systems**

• Improve the interoperability of information systems across various public health systems functions, to ensure a coordinated and aligned approach to systems and security integration.

**Health service delivery**

• Strengthen the delivery of quality essential health service before, and after public health emergencies, while ensuring the maintenance of routine essential services during the emergency.

• Improve engagement of all stakeholders, including private sectors and communities, as part of health systems and health security planning and implementation.

**Conclusion**

Coordination among public health, healthcare service delivery and health security actors before, during and after an emergency is a key primary driver to achieving high-quality UHC. When aligned appropriately, UHC and health security yield strong resilient health systems that are able to provide high-quality and equitable care, for improved health outcomes and well-being. Reflections identified in the analysis of 13 JEE and six NAPHS reports provide opportunities for improvement in the way countries approach IHR implementation, and likewise UHC. With experiences from previous emergencies, there are

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i The scope of health workforce used in the JEE Tool (2018) refers to nurses and midwives, physicians, public health and environmental specialists, social scientists, laboratory scientists/technicians, biostatisticians, IT specialists and biomedical technicians. This scope also includes a corresponding workforce in the animal sector of veterinarians, para-veterinarians, animal health professionals, epidemiologists, IT specialists, and others.
significant opportunities to leverage the lessons, including gaps, to foster a more aligned approach to health emergency management for wider sustainable systems resilience. Systematic considerations, such as integrated, more inclusive approaches to planning and coordination; comprehensive human resource strategies reflecting the One Health approach; and leveraging the private sector and engaging communities and civil society; can be promoted in the JEE and NAPHS reports which would play a vital role to drive the integration of health systems and health security functions. This call for integration and alignment serves to advance a unified and holistic common goal of ensuring that local, national and global systems are well equipped and capacitated to prevent, manage and recover from the growing threats of public health emergencies in the 21st century.
Introduction
One important function of a health system is to maintain a country’s capacity to prevent, prepare, detect and respond to public health emergencies, while maintaining high-quality essential health services for individuals and communities (Fig. 1). Achieving such a function requires health systems to be resilient, with a systematic consideration of emergency preparedness (1,2,3). High-quality, resilient health systems are a key element in the achievement of the United Nations Sustainable Development Goals (SDGs), especially Goal 3, Ensure healthy lives and promote well-being for all at all ages. Resilience has been defined in different disciplines (4). In the context of health systems, it is defined as “the capacity of health actors, institutions, and populations to prepare for and effectively respond to crises; maintain core functions when a crisis hits; and, informed by lessons learned during the crisis, reorganise if conditions require it” (5).

While health security, i.e. an intrinsic value of protection against risk (6), is a key function of resilient health systems, it remains a distinct topic or agenda in many national policies, plans and budgets. Health systems planning (e.g. a health sector strategic development plan) that allows countries to implement and achieve prioritized goals of individual and population health has traditionally focused on service delivery domains (e.g. promotion, prevention, curative, palliation, treatment and rehabilitation), with limited consideration of capacities for the protection of public health from disruptive emergencies. This may mean that health facilities make suboptimal provision for public health functions (e.g. emergency preparedness, response, coordination with other sectors, surveillance) and may lead to increased health security risks at all geographical levels. This has been evidenced by the widespread disruption in the delivery and updating of high-quality health services during the course of past and ongoing crises (see the case study in the box below on COVID-19 and the Ebola virus disease outbreak).

Though health systems alone will not be able to manage the full risk of epidemics like that of COVID-19, preliminary observation suggests that countries with a responsive and agile public sector, with effective governance mechanisms and close engagement of their populations, communities and civil society, have thus far responded well.

Within countries, there are also various disease-specific, life-course-specific and hazard-specific programmes and plans such as those for influenza, HIV, malaria, tuberculosis (TB) and poliomyelitis (polio); maternal and child health and care for the elderly; and natural disasters and chemical, biological, radiological, nuclear and explosives. The noted benefits of these vertical initiatives include their measurability and the visibility of impact of investment through demonstrated rapid reductions in caseloads, mortality rates, etc. However, their benefits to overarching health systems goals are not fully realized and could also contribute to fragmentation and reduce agility to implement a timely response to fast evolving emergencies. A coherent approach to strengthening national health systems is needed for both universal health coverage (UHC) and health security, but it has been largely overlooked.
Increasingly, to bring convergence on the work of disease and life-course programmes to enhance health outcomes and decrease the vulnerability of health threats to societies, countries are developing national strategic directions on quality as part of efforts on health service planning and health systems strengthening. This is because health services are the population’s first point of contact with the health system. Providing high-quality health services and people-centred care before and during outbreaks can limit potential fears about using health services.

**Fig. 1. Relationship between health systems, resilience, universal health coverage and the Sustainable Development Goals**

HSS: health systems strengthening; SDG: Sustainable Development Goal; UHC: universal health coverage. Source: from Kieny at al (7).
Box. Case study: impact of COVID-19 and Ebola virus disease on the delivery of essential high-quality health services

COVID-19, the ongoing pandemic, has caused mass global disruption of economies, societal functions and health services. The pandemic has plunged the world economy into recession, costing up to 8.8 trillion United States dollars (8), with unemployment reaching record levels (9). National authorities have had to enact stringent public health and social measures to control the spread of SARS-CoV-2, protect health systems from dysfunction and protect the health of populations. Countries in all income groups were affected, including those scoring well in UHC and health security measures with mature health systems (10). These “mature” health systems, deemed as robust, have not mitigated the risks or absorbed the impacts of this pandemic. COVID-19 has widely disrupted routine service delivery and compromised the quality of essential health services. In the WHO global pulse survey, 90% of the surveyed 105 countries report disruptions to essential health services since the COVID-19 pandemic began, with the most frequently disrupted areas being routine immunization, noncommunicable disease diagnosis and treatment, family planning and contraception, treatment for mental health disorders, cancer diagnosis and treatment, malaria diagnosis and treatment, TB case detection and treatment and antiretroviral treatment (11). Though almost every country experienced disruption to its health services, maintaining essential health services was not widely considered in COVID-19 planning. Findings from the WHO review of countries’ COVID-19 preparedness and response plans (154 plans from 106 countries) indicated that fewer than half (47.4%) of the plans include explicit consideration of maintaining essential health services (12). Ongoing observation suggests that countries which have thus far responded well to the pandemic seem to rely on a responsive public sector with effective governance mechanisms that enabled close engagement of populations, communities and civil society.

The 2014–2016 outbreak of Ebola virus disease in west Africa also caused long-term economic and public health impacts on already fragile health systems. Analysts estimated the economic impact of the outbreak in Guinea, Liberia and Sierra Leone at nearly 3 billion United States dollars (13). The health systems were overwhelmed. Study showed that the outbreak contributed to a 61% decline in outpatient visits in Liberia (14), a 39% drop in treatment for malaria in children and a 21% drop in children receiving basic immunizations in Sierra Leone (15), and an over 50% drop in primary medical consultations and hospitalizations and a one-third decline in vaccinations in Guinea compared with 2013 (16). Exploration of the underlying factors that caused the significant scale of the crisis pointed to fragmented health-care systems with limited physical, financial and human resources as well as low levels of trust between communities and health-care providers (17,18). The fact that infrastructure, logistics, health information, surveillance, governance, management and health financing were all weak at the onset of the outbreak exacerbated the disruption of routine high-quality essential health services. In addition, the centralization of health system core functions, such as hiring, deploying and managing staff, was a barrier to timely and effective local responsiveness (19). As a result, the shift in resources within countries to Ebola virus disease and away from routine services had a lasting impact: over a million children in west Africa did not receive routine immunizations due to the crisis (20). By May 2015, over 500 health workers had died (21). As the situation evolved, there was a significant improvement in political leadership, global solidarity, trust within communities and trust between communities and the health-care system to deliver high-quality essential health services (17).
The importance of JEE and NAPHS in health systems and health security integration

Following the west Africa Ebola crisis, global health security has achieved renewed momentum by leveraging IHR 2005, which requires all WHO Member States to have in place capacities to detect, assess, notify and report events (IHR (2005) Art. 5) and “respond promptly and effectively to public health risks and public health emergencies of international concern (PHEIC)” (IHR (2005) Art. 13, Annex). In early 2016, the IHR monitoring and evaluation framework was developed in response to the recommendations of the IHR Review Committee and included one mandatory component, that is, States Parties annual reporting to the World Health Assembly on compliance, and three voluntary components: Joint External Evaluation (JEE), After Action Reviews and Simulation Exercises (22). The IHR monitoring and evaluation framework is intended to assist national authorities to identify the most critical gaps and urgent needs for the development of national health security capacity. Countries that have conducted an assessment (e.g. a JEE), are encouraged to develop a costed NAPHS based on priority action recommendations from the JEE and seek technical support from WHO. The post-JEE NAPHS aims to take JEE recommendations forward to achieve the objective of strengthening health and other relevant sectors (agriculture, interior, security, transport, etc.) for IHR implementation within the country. Because of its scope, NAPHS can serve as an important platform to align IHR capacity development, critical preparedness priorities of health systems and a joint approach to health systems resilience with health sector planning and other disease and life-course-specific health programmes underpinning a multisectoral approach.
Methodology and approach
In consultation with USAID, the study focused on data for five technical areas (Table 1) included in the JEE tool, along with corresponding country NAPHS where publicly available. The relevant indicators from the second edition of the JEE tool (23) were applied as a better fit with the context and objectives of this project (Table 1). The project indicators emphasize the health systems angle and potential entry points for health systems and health security integration in relevant technical areas.

The desk review approach was developed in three parts – (1) a targeted review of existing global literature on health systems and health security; (2) study of JEE reports for selected countries in reference to listed indicators (see Table 1); and (3) study of JEE findings in reference to the NAPHS implementation plans. A crosswalk comparison was conducted against the six building blocks and 13 indicators of the WHO health systems framework (24). Priority recommendations, facilitators, barriers and good practices were then captured for each of the five JEE technical areas. Key findings that could support health systems and health security integration are also included. Further, translation of JEE recommendations into NAPHS priorities for action, including planned activities with enablers and challenges, were also studied.

Analysis of all countries, with the exception of Malawi, used the first edition of the JEE tool (JEE1). The second edition of the JEE tool (JEE 2) calls for a holistic public health view on certain technical areas. JEE2 is intended to provide a comprehensive approach to public health emergencies, including development of both preparedness and response plans alongside risk assessments. An additional indicator on “coordination” has been included for emergency response operations to address the multi-layered approach during response efforts; the importance of development, training and retention is also captured.

### Table 1. Core project indicators selected for country desk review

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<th>Original JEE2 indicators</th>
<th>Indicators adapted and applied in the review</th>
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| Prevent National legislation, policy and financing | • The State has assessed, adjusted and aligned its domestic legislation, policies and administrative arrangements in all relevant sectors, to enable compliance with IHR (2005)  
• Financing is available for the implementation of IHR capacities  
• A financing mechanism and funds are available for timely response to public health emergencies | • Current legislation, including laws, regulations, administrative requirements, policies or other government instruments, proven to be adequate in all relevant sectors to support IHR implementation within the frame of health systems resilience  
• Adequate finances available to enable efficient and effective IHR implementation and response to all public health emergencies, as well as enabling health services to maintain high-quality care |
**JEE technical area** | **Original JEE2 indicators** | **Indicators adapted and applied in the review**
---|---|---
**Detect** | Human resources | • An up-to-date multisectoral workforce strategy is in place
|  |  | • Human resources are available to implement IHR effectively
|  |  | • In-service trainings are available
|  |  | • Field Epidemiology Training Programme (FETP) or other applied epidemiology training programme is in place
|  |  | • A trained health workforce that includes nurses and midwives, physicians, public health and environmental specialists, social scientists, laboratory scientists/technicians, biostatisticians, information technology (IT) specialists and biomedical technicians to tackle the shock crises as well as maintaining high-quality health services
|  |  | • Existence of a corresponding workforce in the animal sector of veterinarians, para-veterinarians, animal health professionals, epidemiologists, IT specialists and others
|  |  | • An up-to-date multisectoral workforce strategy is in place to ensure reduction of risk and impact to health services

**Respond** | Emergency preparedness | • Strategic emergency risk assessments conducted and emergency resources identified and mapped
|  |  | • National multisectoral multi-hazard emergency preparedness measures, including emergency response plans (ERPs), are developed, implemented and tested
|  |  | • Existence of national strategic multi-hazard emergency risk assessments (risk profiles) and resource mapping
|  |  | • Existence of multi-hazard ERPs including health system considerations
|  |  | • Evidence from exercises, after-action and other reviews of effective and efficient multisectoral emergency response operations for outbreaks and other public health emergencies
The reviewed countries were selected because they are USAID resilience focus countries. These countries are also priority countries for other USAID initiatives, such as the Global Health Security Agenda (GHSA), and Preventing Maternal and Child Deaths. Documents were reviewed for the following 13 countries: Bangladesh, Ethiopia, Ghana, Kenya, Liberia, Malawi, Nigeria, Pakistan, Sierra Leone, South Sudan, Tanzania (United Republic of), Uganda and Zimbabwe. All JEE data from the identified countries which are available in the public domain were analysed, using the indicators in Table 1.

JEE and NAPHS developed from 2015 to 2020 are captured in the findings. This is indicative of the launch of JEE post the 2014–2016 west Africa Ebola outbreak. Country documents that are completed but not yet available in the public domain, e.g. NAPHS reports of Malawi and Zimbabwe, are considered in the general discussion but not captured as part of the specific findings.
This section provides a summary of the review of country JEE and NAPHS data organized under two subsections: summary of key findings followed by country-specific findings.

**Summary of key findings**

- All thirteen countries have policies, legislation and regulation relating to IHR. However, these are often outdated, having been developed prior to the rollout of IHR (2005) in 2007. Some countries indicated that they have periodic policy reviews to facilitate action on the recommended IHR technical areas and to align strategies to their IHR implementation. The data were, however, limited to ascertaining the legislative drive to health systems strengthening using IHR and other national policy and regulations.

- Countries that have undergone public health emergencies including Liberia, Sierra Leone and Nigeria are applying lessons from those experiences to inform broader planning efforts to set policy and strategic direction for the health sector overall. For example, Liberia and Sierra Leone, building on the considerable experience they gained from the outbreak of Ebola virus disease, have developed emergency preparedness and response plans.

**Desk review – country findings**
Review of JEE and NAPHS data from a health systems perspective

This section provides a summary of the review of country JEE and NAPHS data organized under two subsections: summary of key findings followed by country-specific findings.

Summary of key findings

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- **Countries that have undergone public health emergencies** including Liberia, Sierra Leone and Nigeria are applying lessons from those experiences to inform broader planning efforts to set policy and strategic direction for the health sector overall. For example, Liberia and Sierra Leone, building on the considerable experience they gained from the outbreak of Ebola virus disease, have developed emergency preparedness and response plans.

- **In Nigeria and Pakistan, past experiences with the poliomyelitis (polio) eradication programme** have informed health-sector-wide policies, including those not related to emergency response.

- **Sub-national implementation approaches can improve or hinder effective preparedness and response.** Liberia highlights the critical role of the subnational level in supporting an efficient and effective response effort, particularly in translating national policies and decisions to the operational level in emergency management. Ethiopia reported missed opportunities to align policy with operational planning at the national and subnational level, leading to weak preparedness capacities.

- **Across all countries, financial resources were deemed insufficient** to implement necessary legislation and policies, which implies a need for allocation of resources for IHR implementation in the national budget for sustainability and mainstreaming of efforts in wider health sector programming and budgeting.

- **All countries reported the existence of a human resources for health strategy.** The focus of the strategy is often on human health, with little to no attention being paid to public health protection or the animal health workforce. Varying levels of human, public health and animal health expertise were recorded across
• countries, as well as an inequitable distribution of health workers within the country.

• It is essential to develop **multi-hazard emergency preparedness and response plans**. Although emergency preparedness and disaster plans exist in some form in some countries, they are siloed, disease-specific and sector-specific. The majority of countries reported preparedness plans for Ebola, Lassa fever and cholera, given the recent history of the Ebola outbreak and the recent development of multiple JEE.

• The existence of an **emergency operations structure** does not in itself ensure sector-wide coordination for timely health systems response. Many countries reported an established EOC. However, these structures were often not underpinned by clear protocols with chains of command, coordination and identified responsible parties, which reduces the EOC’s effectiveness. Moreover, there was no clear designation of health systems focal points, particularly to oversee the maintenance of essential services and other health systems functions during emergencies.

• Close **engagement with law enforcement and security agencies** is reported in all countries, with clear mapping of stakeholders conducted and available policies and plans to engage law enforcement and security agencies in public health emergency preparedness and response. One key bottleneck identified is the lack of protocols and SOPs to support effective coordination and information-sharing between the two sectors.

The majority of the countries had recommendations related to governance, health financing and health workforce (see Fig. 2). This could be due to countries being predominantly at the early stages of

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**Fig. 2. Recommendations emerging from country-level JEE data to inform NAPHS development, mapped against the six WHO health system building blocks**

- Bangladesh
- Ethiopia
- Ghana
- Kenya
- Liberia
- Malawi
- Nigeria
- Sierra Leone
- South Sudan
- Tanzania
- Uganda
- Zambia
- Zimbabwe
IHR implementation and requiring strong policy and legislative groundwork. Moreover, many of the indicators require an enabling policy and legislative context as a basis for implementation capacities.

**Detailed findings by country**

Findings derived from each country’s JEE and NAPHS (where available) is shown by category (national legislation, policy and financing, human resources, emergency preparedness, emergency response operations and links between public health and security authorities – see Table 1 above). These findings also included recommendations from JEE reports. Positive factors (enablers) are indicated by blue graphics and bold type; barriers and gaps are indicated by red graphics and italic type.

**1. Bangladesh**

**National legislation, policy and financing**

According to the JEE report, Bangladesh’s laws and acts related to IHR (including the Communicable Disease Prevention, Control and Eradication Law 2016, drafted and introduced to Parliament in 2016) showcased the country’s “developed capacity” in legislation and policy. However, the Communicable Disease, Prevention, Control and Eradication Law 2016 was not ratified at the time of the JEE. The JEE raised the ratification of this legislation and unsustainable financing as barriers to IHR implementation, since linkages between national public health policies and laws and the IHR are critical for effective implementation.

![Unsustainable financing](image1)

![IHR implementation regulation not ratified](image2)

![Some laws and acts related to IHR implementation](image3)

**Human resources**

The Bangladesh Field Epidemiology Training Program (FETP) is a method described in the JEE that is used to build up the public health workforce to prevent, detect and respond to public health emergencies. The latest FETP cohort included two
veterinarians, and it was planned to place one trained epidemiologist at each subdistrict level in Bangladesh. Despite the use of FETP, the JEE found that the number of public health workers remained limited at the national and subnational level. Furthermore, the JEE highlighted that the health workforce strategy prioritized expanding the health workforce, but did not include public health workforce expansion specifically.

Emergency preparedness

The JEE mentioned institutionalized preparedness plans and practices to better prepare for and respond to emergencies following shocks from outbreaks of infectious diseases (e.g. Nipah virus, anthrax, avian influenza) and natural disasters (e.g. floods, cyclones). Examples include a strategic preparedness plan and several disease-specific contingency plans. Despite increased efforts to prepare for and respond to emergencies, the JEE found IHR capacities were spread out across various Government ministries and needed to be scaled up. Furthermore, the JEE emphasized preparedness and response plans for specific diseases rather than including all hazards, the absence of which is a barrier to IHR implementation.
Emergency response operations

Bangladesh designated a physical space and established two 24-hour/7-day hotlines for its EOC. The JEE found that the country’s ad hoc emergency operations procedures had enabled it to respond effectively to emergencies in the past. However, it noted that this informal process threatened the rapidity of future emergency response, because knowledge of the ad hoc procedures was confined to a small group of experienced staff. There was no evidence of a formal process for activating the EOC, as recommended in IHR (2005), or rotation of EOC personnel responsibilities among a larger roster of experienced professionals.

Linking public health and security authorities

The JEE highlighted instances of public health and security authority collaboration to curb avian influenza outbreaks and assist in conducting TB surveys. JEE also reported that representatives of the Ministry of Home Affairs and the Ministry of Defence participated alongside law enforcement authorities in various committees and plans, such as the IHR committee and the influenza pandemic preparedness and response plan. However, the JEE team found that this coordination and mobilization of law enforcement authorities was only informal. JEE experts did not identify any existing formal protocol or SOP to interact with law enforcement.
2. Ethiopia

National legislation, policy and financing

The National Health Sector Transformation Plan (NHSTP) 2015–2020 identifies improved health emergency and risk management as a priority. The adoption of policies and alignment with the NHSTP is intended to ensure integrated national planning, which is important for building national and subnational health systems resilience, though information is limited. The existence of the Ethiopia Public Health Institute, a central entity supporting IHR implementation, was established under Ethiopian Public Health Institute Regulation 301/2013. The establishment of the National Public Health Security Council is expected to provide structured coordination above the single ministry level in order to improve multisectoral IHR implementation. JEE experts suggested that operationalization could be improved by, for example, establishing a national public health security council.

Human resources

JEE experts found that the field epidemiology capacity of Ethiopia is adequate, even though staff numbers are lower than the WHO (JEE tool) requirement (i.e. one staff member per 200 000 population) and numbers vary among different regions. Basic and advanced Ethiopia FETPs are available, and a standard reporting mechanism has been established between the different levels of health governance (national and subnational). The health workforce strategy is reviewed annually, with retention strategies in place for health workers. However, JEE experts raised the need to develop a comprehensive workforce strategy, which considers various public health professionals.
Emergency preparedness

The JEE described how Ethiopia had institutionalized disease-specific preparedness plans and practices (Ebola, measles, meningitis, pandemic influenza, Middle Eastern respiratory syndrome, etc.) to better prepare for and respond to emergencies. However, the JEE experts raised the need to develop a comprehensive emergency preparedness and response plan) that incorporates all diseases in a holistic manner. Regarding risks, a disaster risk profiling framework based on hazards, vulnerability and capacity has been developed to assess risks at district level. Several committees and task forces have been established to operationalize the national policy and strategy on disaster risk management. The JEE report makes no reference to the existence of any national strategic emergency risk assessment, profile or resource mapping.
Emergency response operations

Although there is an existing EOC, the incident management system and EOC plans and procedures are not yet in place. Case management guidelines have been developed for epidemic-prone disease and health workers at all levels are aware. Additionally, there are no regular public health emergency operations centre (PHEOC) training or exercise programmes.

Linking public health and security authorities

Facilitators identified in Ethiopia include guidelines and SOPs established at points of entry, with identified points of contact. The JEE report highlighted the need for a strong legal framework and the lack of clarity concerning measures to strengthen the linkage between public health and security authorities. The JEE recommendation was aligned with the NAPHS.
3. Ghana

National legislation, policy and financing

The JEE report noted best practices to facilitate the full implementation of IHR, including an assessment of all the existing regulations, legislative instruments, policies and Government initiatives in the human, animal and environmental sector. IHR (2005) is also fully integrated into the Public Health Act. Current legislation remains an area that could be improved by reviewing and approving legal and regulatory frameworks. The JEE report also highlighted the fact that the recommendations do not address availability of adequate financing for IHR implementation for response and continuity in high-quality health services.

Human resources

There is no strategy in place to develop the public health workforce in Ghana and, as a result, human resources to implement IHR (2005) core capacity requirements are geographically unevenly distributed and skewed towards the south of the country. The JEE report highlights the availability of long-term training programmes to improve the pipeline of qualified public health professionals within the country, including applied epidemiology training. Additional identified facilitators in the report include multidisciplinary human resources capacity (epidemiologists, veterinarians, clinicians and laboratory specialists/technicians) available at national level and in some of the regions. At regional level, rapid response teams have been identified and trained. Advanced and front-line FETP training programmes are also in place.
Emergency preparedness

Ghana has finalized a national public health emergency preparedness and response plan addressing IHR core capacity requirements and other IHR-related hazards, as well as points of entry. However, the plan needs to be implemented via a national threat hazards identification risk assessment tool. Emergency procedures for highly infectious diseases are also in place throughout the country. Protocols have been established for community surveillance, patient isolation and contact tracing. This system is being used as the foundation of preparedness for other infectious disease hazards. A public health risk assessment, capacity mapping, resource mapping and identification of stockpiles have been completed. However, the recommendations relate to conducting a comprehensive mapping of existing resources and capacities, including those supported through partners, as well as conducting a retrospective review of funding flows for emergency response.

Emergency response operations

The JEE report highlighted established capacity in emergency response operations owing to the existence of emergency response committees, teams and the availability of a public health EOC with draft SOPs. Three entities exist for coordinating emergency response: the Public Health EOC, the National Disaster Management Organization and National Technical Coordination Committee. Case management guidelines are available for some priority diseases, including Ebola virus disease and cholera.
Linking public health and security authorities

Experiences gained from the Ebola outbreak prompted the establishment of an inter-ministerial committee charged with securing the country’s borders. This indicates that the foundation for such cross-sector collaboration is present in Ghana and could be applied to future outbreaks or emergencies. Indeed, several stakeholders from different sectors are involved in responding to public health emergencies in Ghana. However, as mentioned in the JEE report, there are no formal protocols, memorandums of understanding (MoUs) or other agreements between public health, animal health and security authorities on collaboration to respond to a public health emergency.

4. Kenya

National legislation, policy and financing

Kenya has existing legislation for IHR implementation, including the Public Health Act, which covers most of IHR. The existing legislation should be reviewed for alignment with IHR implementation. An integrated disease surveillance response that integrates IHR implementation is also available. Currently, there is no specific budget line for IHR implementation within the Ministry of Health. However, specific departments are involved in resource mobilization. The JEE report highlighted multilateral/bilateral agreements and MoUs with regional bodies and several countries and the existence of a formal One Health unit has enhanced collaboration within line sectors.
Workforce development

Kenya has developed a five-year health workforce strategy covering human health, but not public health specialties. At the national level, all IHR capacities are present in the country, with a focus on specialized cadres including epidemiologists, social scientists, specialized medical personnel and biostatisticians. County and subcounty health management teams exist to support IHR implementation, although the distribution of capacities varies from county to county. The JEE report highlighted systems in place to train doctors, dentists, pharmacists and veterinary doctors through the local universities. Multisectoral human resources are available at national level in respect of both animal and human health. All three tiers of the Field Epidemiology and Laboratory Training Programme (FELTP) are operational and funding is available; however, sustainability remains an issue since the operational costs of the programme are met by donors. One Health coordination is robust at national level; however, it is not well structured at the subnational level.

Emergency preparedness

The JEE report highlighted that Kenya has surge capacity to respond to public health emergencies of national and international concern. Integrated disease surveillance response (IDSR) technical guidelines exist, alongside disease-specific plans in animal and human health, event-specific and sector-specific preparedness plans, including the National Disaster Response Plan, Disaster Risk Management Strategic Plan and National Emergency Response Plan, and SOPs. However, it is not known whether these are multi-hazard plans including health system considerations. JEE experts also stress the absence of a central structure for coordinating preparedness activities in Kenya, which was previously coordinated by multiple agencies at various levels of government. The JEE report states that no evidence from exercises, after-action or other reviews of effective and efficient multisectoral emergency response operations for outbreaks and other public health emergencies was reported. Specific public health risk assessments and resource mapping have been conducted for laboratories, health facilities and human resources.
Emergency response operations

The health emergency response in Kenya is led by the public health EOC. The country uses a draft public health EOC framework that defines the vision, mission, objectives, scope, purpose, concept of operation, structure, roles and responsibilities and SOPs. The public health EOC gathers real-time information from public rumours and other sources using hotlines, media monitoring and the District Health Information Software 2 (DHIS2) software. An incident management system is linked with the animal health sector and other relevant agencies. The role of community surveillance is also identified as a critical lever due to active surveillance from informal sources (newspapers, social media) and formal sources (reporting systems) with daily and weekly reports. Case management guidelines are available for the major communicable diseases.
Linking public health and security authorities

Kenya has formal, legally mandated mechanisms for linking public health and security authorities during a public health emergency. The country has a legal framework covering all interagency cooperation and coordination on public health emergencies; disaster management units are embedded within individual ministries, with links to security services. The multisectoral emergency response plans (ERPs), including the national ERPs, cover public health and security services. A number of these plans have been evaluated and tested through simulation exercises in recent years. However, the multitude of plans and stakeholders involved have led to difficulties with coordination, resource mobilization and timely response in past emergencies.

5. Liberia

National legislation, policy and financing

Current levers identified within the JEE to support systems and security linkages include the Government’s development, adaptation and adoption of laws and policies related to aspects of IHR core capacities. Following the Ebola virus disease outbreaks, the National Public Health Institute of Liberia (NPHIL) and the Investment Plan for Building a Resilient Health System in Liberia 2015–2021 were created. The establishment of NPHIL was underpinned by national legislation, and the Investment Plan cites the following high-priority areas: building the health workforce; reengineering health infrastructure to match population health needs; and strengthening preparedness, surveillance and response. There is evidence of intersectoral collaboration and coordination to implement legislation and plans in the country. Reflections from NAPHS activities in legislation, policy and financing were aligned with those identified from the JEE recommendations. The recommendation on making One Health a national policy, to increase Government financial input, strengthen and speed up IHR implementation in all sectors of Liberian society and increase collaboration between all stakeholders in the country, was not taken up.
Workforce development

A health-care workforce strategy exists in Liberia for human health, but not for animal health – animal health activities are grossly under-resourced. Other current levers include basic training in field epidemiology supported by partners available in the country, and an appreciable (though still not sufficient) human resource capacity. Workforce attrition remains an issue. The recommended priority actions for Liberia emphasize resources for in-service training, mentoring (through exchange visits), One Health and the FETP/FETLP, and enrolling human resources for health from the animal sector into the FETP. No reference is made to a multidisciplinary health workforce to tackle shocks and maintain high-quality essential health services. There is a shortage of veterinarians and epidemiologists.

Emergency preparedness

Liberia has developed a disaster management strategy, and a national disaster management agency has been established. A national ERP exists, which focuses on the IDSR epidemic-prone diseases. However, the country does not have a multi-hazard national public health ERP. Current facilitators include strong political will and strong governmental leadership, alongside strong collaboration with other key stakeholders. Recommendations from Liberia reflect the need to put in place governance arrangements, particularly creating a national-level multi-hazard public health emergency preparedness and response phase. The recommendations address
components of human resources, namely developing a pool of technical expertise for the health workforce and improving the protection and safety of the health workforce. The country has also completed risk mapping for priority public health risks and resources, and a database has been created, with short-term pre-positioning of supplies. Emergency response capacity is available to some extent; however, it requires additional capacity. Reflections from the emergency preparedness NAPHS activities for Liberia were also consistent with those identified from the JEE recommendations.

Emergency response operations

The JEE report mentions the existence of an EOC in all 15 counties, since the establishment of county EOCs was one of the key strategies and approaches used to fight the Ebola outbreak. Other facilitators include an incident management system and linkages with the subnational county level through district and county rapid response teams made up of trained staff. Emphasis for emergency response in Liberia is placed on training and retaining health workers, the EOCs, national ownership, funding and intersectoral collaboration. Emergency operations at national and county level are decentralized and guided by sound, well-structured documents. Reflections from the Emergency Response Operations NAPHS activities for Liberia highlighted that these were not aligned with those identified from the JEE recommendations. Only one of the four JEE recommendations were taken up in the planning process, which may be indicative of reprioritization and/or consideration under other planning.
Linking public health and security authorities

Liberia demonstrated the capacity to integrate security authorities with public health and associated sectors to deliver the national emergency response. Experiences of the Ebola virus disease outbreaks have contributed to this capacity. The role of security services is identified in the 2016 Epidemic Preparedness and Response Plan. Existing legal and policy instruments should be reviewed, which could lead to formalized partnership arrangements and development of SOPs.

6. Malawi

National legislation, policy and financing

The JEE report mentions a supportive environment created by the existence of the Public Health Institute of Malawi (PHIM), legal instruments and policies. However, not all legislative documents meet IHR requirements; they need to be revised to enable compliance with IHR across all relevant sectors and provide necessary resources. Resources, both financial and in-kind, provided by international partners facilitate implementation of these policies. However, domestic resource allocation and mobilization are of significant concern during both emergency and non-emergency periods, since only certain aspects of IHR implementation and support receive consistent and timely financing. The JEE report stresses the need to establish mechanisms for coordinated contingency funds management and oversight for public health emergencies that ensures that funds are available when required. A National Disaster Appeal Fund for emergency use has been established within the Department of Disaster Management Affairs (DoDMA) and is available for certain public health emergencies.

Limited domestic resource allocation and mobilization

Existence of PHIM

Lack of national policy framework that clarifies all ministry roles and responsibilities relevant to IHR implementation
Workforce development

Malawi has a strategy for the development of the human health workforce (2018–2022) aligned to the Health Sector Strategic Plan II (2017–2022). However, the strategy does not cover key public health professionals required for IHR. Although the workforce vacancy rate is high in the health (45%) and animal (50%) sectors, there are plans to increase the number of health workers to deliver the Essential Health Package by 2022. Other strengths identified include multidisciplinary human resources capacity, with some capacity to deliver on IHR; incentives in place to retain the existing public health workforce in the country; a PHIM strategy outlines positions for the public health workforce at various levels; in-service training is provided by some programmes, institutions or professional bodies; and front-line FETP in the country has supported outbreak investigations. Recommendations for the health workforce from the JEE pertain to health resource mapping and revising the national human resource strategy; progression mechanisms for human resources; evaluating the effectiveness of the FETP; establishing SOPs for deployment; and training a multisectoral and multidisciplinary rapid response team.

Emergency preparedness

Malawi has a national emergency risk profile that is reviewed and updated annually to accommodate emerging threats or changing risks. National risk profiles and resources are shared with relevant sectors by DoDMA, the structure officially responsible for the management of disasters of every nature, although the animal health sector is not formally covered. There is

Alignment with broader national health sector plan and the Essential Health Package

No established procedures for deployment and training a multisectoral and multidisciplinary rapid response team.

Strategy for the development of the human health workforce available

Fragmented and ad hoc processes for public health emergency preparedness

Recent national emergency risk profile available
insufficient clarity on roles and responsibilities and DoDMA’s mandate for PHEICs. The few simulation exercises undertaken are conducted without a multisectoral approach. Recommendations for action cited in the JEE report include conduct of strategic risk assessment, comprehensive resource mapping, simulation exercises, budget/funding. Developing a multi-hazard public health emergency preparedness and response plan with SOPs for each sector is also recommended. The recommendations indicate the need to incorporate lessons learned into the plan. No reference is made to evidence of efficient multisectoral emergency response operations for outbreaks or other public health emergencies.

Emergency response operations

A national health sector emergency response coordination mechanism and an incident management system exist through the One Health committee. Most districts have strengthened their capacity to manage emergency response through district public health emergency management committees. Despite the absence of a fully functional EOC, capacity to respond to public health events has been tested through national coordination of operations in response to recent anthrax, cholera and typhoid outbreaks. Recommendations for action pertain to developing a multidisciplinary emergency coordination structure for public health/animal health with clear terms of reference and SOPs which align with the broader national disaster institutional structure; establishing a national hotline and permanent national and district EOCs for activation; and identifying a cohort of potential incident managers with specific expertise in the relevant infectious diseases.

Linking public health and security authorities

Information available in the JEE report is limited for this project indicator. No MoUs exist, and no joint investigations, simulation exercises or training materials have been conducted. Existing legislation enables public health authorities to exercise mandatory detention or quarantine of individuals who present a public health risk. Linkages between the Malawi Department of Immigration, the Civil Aviation Authority, Defence Force, fire brigades and the police service support are reported.
7. Nigeria

National legislation, policy and financing

Nigeria has enacted diverse legal instruments and policies that facilitate the implementation of IHR (2005) – including the National Health Act 2014 – but they do not address the prevailing public health environment. For example, the Nigeria Centre for Disease Control (CDC) currently exists without a legal mandate. Moreover, given the decentralized nature of Nigeria, the administrative semi-autonomy of the states has established an additional layer that often hinders the application of laws, regulations, guidelines and other instruments addressing IHR. Areas of improvement noted for legislation and policy include: the need to conduct comprehensive assessments and revision of existing legislation for IHR implementation; completion of the pending legislation; extension of existing policies/guidance/guidelines to subnational level for implementation; and streamlining of roles across ministries/agencies and at the state/local government level. There is no reference to ensuring adequate financing for both response and maintenance of routine high-quality essential health care. The level of funding for IHR implementation varies across the state and federal levels. Federal Government and state funding apparently vary across the different states or regions, to cater adequately to the heterogeneity at the subnational level.

Comprehensive review of existing instruments to align with IHR needed

Variability of funds across national and state levels

Strong state-level legislative and policy environment exists

Workforce development

Nigeria has a workforce strategy, but it omits critical specialists such as epidemiologists, veterinarians and veterinary technicians. Strengths identified in the system include the Nigeria FELTP and the FETP. The FELTP has trained several hundred professionals in human, public and animal health. The country has also introduced a field epidemiology programme. Consequently, Nigeria has well trained public health professionals who support public health activities across all levels of the health-care system. Although workforce development has been addressed in the context of the FETP, this is limiting. Recommended priority action areas identified in the JEE report include the development of a comprehensive national public health workforce strategy, though this does not
address reduction of risk or impact of health services; further expansion of the FELP programme; and career pathways for specialized public health workers.

Emergency preparedness

Facilitators of preparedness in Nigeria include the surge capacity to respond effectively to recent public health crises and strategic stockpiles created using information gathered from IDSR-based surveillance to determine priorities for resource stockpiling and distribution. However, Nigeria’s preparedness is limited owing to a lack of coordinated all-hazards preparedness plans at national and subnational levels. Draft plans exist addressing specific diseases or focused on specific agencies, but these plans are not interconnected or multisectoral. National crisis management, disaster response and contingency plans exist, but do not specifically address public health emergencies. Additionally, these plans do not always clearly articulate the roles of health agencies at all administrative levels.
Emergency response operations

Levers identified include routine public health surveillance and situational analysis prepared to respond to public health emergencies. The Nigeria CDC has a situation room that provides a physical space for an EOC for responding to public health emergencies. The EOC has operating procedures, but the full array of SOPs is not yet available. While the EOC utilizes an incident management structure during activations, plans and procedures for incident management are not fully developed. The findings show several emergency response coordination mechanisms in place, such as the EOC for polio elimination and the Nigeria CDC EOC. The capacity of the Nigeria CDC has been tested by the EOC being activated several times and has been an important contributor to the successful control of several public health emergencies. Training of staff is conducted but not standardized.

Linking public health and security authorities

Levers identified within the system include legislation in place giving public health authorities the power to detain and/or quarantine individuals who present a public health risk; the IDSR system is currently being implemented across health facilities in the country and several stakeholders, including the Nigeria CDC, the Nigeria Emergency Management Agency and security forces, currently support the public health response in north-eastern Nigeria. The Nigerian Air Force, for example, currently supports the public health response in north-eastern Nigeria in order to ensure that all children are immunized against polio. However, the JEE report highlights the fact that there has been limited coordination with the animal and agriculture sectors in emergency response and during EOC activations.
8. Pakistan

National legislation, policy and financing

The country has a substantial national and provincial legal framework to support and enable the implementation of IHR and the GHSA technical areas targets. The legal framework for IHR coordination derives from the 1973 Constitution and its amendments that contain mechanisms for coordination between the different parts of the Government and the rules of business that define the responsibilities of each ministry. Recommendations address the legal environment through assessment and tools and reinforcing IHR implementation linked to health system strengthening. Assets identified to support integration include the fact that IHR is entrusted to the Ministry of National Health Services, Regulations and Coordination (including the national IHR focal point) and the substantial legal framework that exists for most technical areas.

Workforce development

In Pakistan, human resources are available in various disciplines (physicians, epidemiologists, biostatisticians, information systems specialists, veterinarians, social scientists, laboratory technicians/specialists and other public health personnel) and are trained in both public- and private-sector institutions. Sufficient capacity has been recorded at both national and provincial level to implement IHR core requirements, and a large workforce of community health workers (lady health workers, migrant workers, etc.) provides primary health care services. Management staff exist across all levels and incentive-based retention exists for health professionals in Punjab and Khyber Pakhtunkhwa. The Government established a FELTP in 2006. A health workforce information system is available.
Emergency preparedness

Health emergency preparedness and response networks at federal and provincial levels were created in Pakistan following the 2010–2011 mega-floods. An all-hazards national emergency preparedness plan was initiated in 2014 but was not finalized due to a lack of resources. However, Pakistan developed several national-level hazard-specific preparedness plans and efforts, including the National Epidemic and Pandemic Preparedness Plan 2014 and the Avian Influenza Preparedness Plan 2011. The JEE report also notes the twofold increase of the annual budget of the National Disaster Management Authority from 2012 to 2013, and the resource mapping conducted for vertical health programmes.

Emergency response operations

EOCs have been established at all levels since 2015 and remain constantly active since polio has been declared a public health emergency. Partners provide technical and human resources support for EOC functions. The emergency health cluster approach is well established. This can be attributed to the high number of emergency events within the country, including health and those related to climate and natural disasters, coupled
with manmade risks and threats, which have given Pakistan best-practice experience. Rapid response and security exercises are also conducted regularly. Recommended areas for action include development of a multisectoral, all-hazards and national health ERP, expanding existing polio-associated documents to other One Health-related hazards and emergencies and developing cross-cutting processes to strengthen capacities to manage IHR-related hazards, including finances and training of human resources to sustain the EOCs and response operations.

Linking public health and security authorities

As stated in the JEE report, the rules of business of the Government of Pakistan enable the public health service at federal, provincial and district levels to request assistance from the police and other security assets. The National Disaster Management Authority (which also covers the provincial level) has clear protocols that engage the police or the army to assist with any event requiring law enforcement, rescue or relief and rehabilitation operations. There are highly coordinated and integrated strategies developed jointly by public health and security agencies to mitigate the risk of attacks on health workers involved in the polio eradication programme, in particular. However, the country lacks SOPs for coordination across public health and security sectors. The national and provincial health emergency preparedness and response plans remain unfinalized.

9. Sierra Leone

National legislation, policy and financing

Sierra Leone has legislation and several regulations and administrative documents that govern public health surveillance and response, although many are outdated. Given their experiences of the Ebola virus disease outbreak, national and subnational MoUs between Sierra Leone, Liberia and Guinea exist for information-sharing and joint planning for and response to Ebola. As mentioned in the JEE report, the country should
now focus on improving intersectoral collaboration and updating MoU/bilateral agreements beyond the Ebola virus disease outbreak of 2014 and 2015.

**Workforce development**

Although the country has multidisciplinary human resources capacity (epidemiologists, veterinarians, clinicians and laboratory specialists or technicians) at the national level, Sierra Leone’s health workforce is facing severe constraints in terms of numbers of qualified staff, equitable distribution throughout the country and level of skills and competence, for both the human and animal sector. For instance, there are only four veterinarians in the country, and more than 50% of health workers are in the capital, leaving the rest of the country with severe shortages. Moreover, the current workforce strategy is based on the Basic Package of Essential Health Services, which does not address the public health workforce such as epidemiologists and social scientists. The JEE report notes as strengths: the introduction of performance-based financing as an incentive system for retention of health workers; training on IDSR, which has established communication between national and district levels; and mentorship provided by district surveillance officers (DSO) and national surveillance officers to front-line staff. The FETP has also supported capacity-building and contributed to greater involvement of DSOs in the production of weekly epidemiology bulletins.
Emergency preparedness

Two key structures exist in Sierra Leone to support preparedness – the District Disaster Management Committee which coordinated all activities at this level and Resilience and Response Teams. The country has also developed a National Multi-Hazard Contingency Plan that includes disaster management, although the plan is not oriented to health and it does not meet IHR requirements. Existing plans are thematically based (focusing specifically on Ebola virus disease, cholera, Zika virus disease and flooding) and not integrated into a comprehensive public health emergency preparedness and response plan. However, emergency response structures are available across lower levels of government, and Sierra Leone has surge capacity to respond to public health emergencies, even if the country faces challenges in obtaining drugs and medical supplies at short notice or in the case of emergencies. This response is supported by mechanisms which allow the Ministry of Health to redeploy health personnel as necessary to fill needs and functions in emergencies. As mentioned in the JEE report, resource mapping has not been conducted in Sierra Leone.

Emergency response operations

Sierra Leone has functional EOCs in place at district level and one national EOC. To operationalize the EOC, there is an established incident management system, emergency operations plan, EOC operational plan and EOC SOP. The coordination structures for the EOC cover line ministries, agencies, partners and security services. As mentioned in the JEE report, Sierra Leone should increase EOC staff competencies, simulation training and funding for EOCs to ensure their effectiveness.
Linking public health and security authorities

The Public Health Ordinance, 1960 provides the overarching legal basis to authorize the Office of National Security to engage in a public health emergency response, as it did during the Ebola outbreak. Other enabling legislation is also available and effectively used, including a standing order on joint deployment of the military and police during civil emergencies (inclusive of public health emergencies). These security authorities attend and participate in the EOC.

10. South Sudan

National legislation, policy and financing

South Sudan has legislation and several regulations and administrative documents that govern public health surveillance and response, including the National Health Policy (2016–2026) and the draft National Health Sector Development Plan (2017–2021). There is also a Public Health Act, which has not been publicly released. The need for adequate financing is noted within the context of creating a budget line for routine and emergency IHR actions, and this has been recommended as an action area. Recommended areas of action include enactment of IHR-related policies, a desk review of laws touching on IHR implementation, formalizing MoUs and establishing budget lines for routine and emergency priority actions.

Workforce development

South Sudan has a national human resource development strategy, though it covered only the period 2006–2017 and does not cover public health professionals. Strengths identified within the system include a variety of education and training courses available at all pre-service levels. However, the capacity of local training institutions to produce the quality of human resources required for effective IHR implementation is low. Health workforce capacity is thus low at all levels in terms of numbers and skill mix of the requisite human resource. There is also no explicit mention of a corresponding animal health workforce. Recommended priority areas identified included: conducting comprehensive human resource mapping/revision; engaging relevant stakeholders for FETP; and expanding the scope of the Ministry of Health human resource database to capture and track relevant information.
Emergency preparedness

In South Sudan, an all-hazard national emergency preparedness and response plan has yet to be developed; however, some disease-specific response plans exist and risk assessment for hazards have been conducted countrywide. The country has yet to carry out comprehensive resource mapping in line with the identified risks and hazards. A plan is also in place to create a directory of rapid response teams and relevant human resources, determine the capacities of the different health facilities, map capabilities and available partners, and decide on locations to stockpile key logistics. There is a need to include mapping of resources for the emergency response and development of mechanisms for resource mobilization for preparedness and response to emergencies from all key stakeholders.

Emergency response operations

The South Sudan EOC is currently in creation, and multisectoral rapid response teams are in being set up. Otherwise, the country has case management guidelines for epidemic-prone diseases, and there is continuous capacity-building for identified ad hoc EOC personnel. A functional ad hoc EOC team exists in the country, despite resource constraints, and the existence of an emergency preparedness plan for cholera and Ebola has also been recorded. The use of the media and information, education and
communication materials to raise public awareness is an added strength of the South Sudanese system. Recommendations cover the need to establish an emergency response coordination mechanism or incident management system, and the development of EOC plans.

**Linking public health and security authorities**

South Sudan has very limited functional links between public health and security authorities. At the time of the JEE report, there was no signed protocol, MoU or other written agreement linking public health with the security forces. No joint exercises or simulations by the public health and security authorities have been conducted. However, information on any disease or outbreak suspected by security agencies is passed on to the Ministry of Health. Security authorities and other actors are aware of the leading role of the Ministry in emergency preparedness and response, although there is very little awareness by some security personnel of their role in coordinating with public health authorities. Some security authorities still have their own health committee, but they are not linked with the Ministry of Health.

**11. Tanzania (United Republic of)**

**National legislation, policy and financing**

In the United Republic of Tanzania, policies and acts addressing various aspects of IHR have been enacted at the national level and adopted, including the National Health Policy 2007, the Health Sector Strategic Plan IV and the Public Health Act 2009. IDSR has also been updated following a review of all relevant existing legislation and instruments. Further best practices include using an existing public health response,
such as the cholera outbreak, as a test for the system. At the national level, resources may be allocated within the national budget to support IHR implementation and the development of national IHR core capacities. Recommendations for legislation and policy include operationalizing One Health, clear roles and responsibilities for the IHR working group and supply chain management.

**Human resources**

A Human Resources for Health Strategy 2015–2020 guides workforce development for the human health sector. There is no explicit mention of developing an updated human resources for health strategy for a multisectoral workforce. Facilitators identified in the system for integration include: training courses for the district health management team and in-service employees who want to advance their training in field epidemiology; cross-border partnerships for the health workforce, e.g. Tanzanian FELTP residents assisted in the 2012 Uganda Ebola outbreak; and a range of training in human, animal and public health to strengthen IHR capacities. Human resources priorities for action include reviewing pre-service curriculums, enrolling animal health professionals in FELTP and mentoring of staff.

**Emergency preparedness**

The human and animal health authorities have an exceptional understanding of public health preparedness. Health risk evaluations and mapping efforts were conducted for five regions in 2013, and multisectoral tabletop simulation exercises have been conducted, in coordination with the Prime Minister’s Office, on public health emergency scenarios. Facilitators identified in the system include multi-hazard/all-hazard plans; draft disease-specific preparedness and response plans; and surge capacity achieved through reallocation of resources available at various levels of implementation, including the private sector. Past exercises conducted on health risk evaluations and disaster risk management country capacity evaluations can also serve to inform broader integration efforts. Recommended areas of action include: establishing regulations and effective agency structure to operationalize the Disaster Management Act, revising and aligning the Public Health Act with IHR, advocacy to senior officials and conducting risk and resource mapping.
Emergency response operations

A PHEOC is already in existence; from the findings, it appears to have draft protocols which allows all sectors to work together. Full utilization of the incident management system as a national standard has been instituted in the PHEOC. This enables interoperability with subnational health authorities and other agencies and sectors as they further develop their plans. IDSR is utilized in the majority of the regions. A basic PHEOC management SOP in final draft form is being used, even though it is not yet approved. The recommendations for action pertain to the need to ensure high-level leadership for the PHEOC, funding, staff training, physical space and establishment of a health emergency programme.

Linking public health and security authorities

The United Republic of Tanzania has gone part of the way to linking public health with law enforcement. Although the Tanzania Emergency Preparedness and Response Plan covers work with the law enforcement subsector, the roles of law enforcement are not clearly stated. Protocols that allow all sectors to work together have been established within the Prime Minister’s Office. The associated health ministry has undertaken a simulation exercise together with law enforcement. One area for improvement is the unclear definition of stakeholders’ roles.
12. Uganda

National legislation, policy and financing

The JEE report highlighted the considerable volume of legislation, regulations and Government instruments available in Uganda. Uganda has in place cross-border agreements on health to support IHR. At the district level, IHR activities are supported through a decentralized approach. A total of 3.5% of the national budget is reserved for emergencies, which can be operationalized relatively quickly when needed. A number of these policies have been reviewed and revised following an assessment. Recommended areas of action from the JEE report centre heavily on financing, with adequate financing for One Health as a priority.

Human resources

The JEE report identified several strengths regarding the workforce development in Uganda including: multidisciplinary teams organized through national and district task forces and response teams; a range of education and training courses; the high number of epidemiologists (175); and the FETP, which covers all three tiers and provides strong staff training capability. However, JEE experts suggest developing a harmonized expanded immunization curriculum, expanding the FETP programme, creating a human resources for health tracking system and funding and evaluating training programmes.
Emergency preparedness

Uganda has a National Policy for Disaster Preparedness and Management and a five-year (2016–2020) National Multi-hazard Preparedness and Response Plan (NMHPR). The NMHPR lacked preparedness and response planning components; it is more of a national strategic plan that details high-level priority interventions to improve core capacities. A detailed national emergency preparedness and response plan has therefore yet to be developed. A simulation exercise was conducted in one district to assess the operational readiness of the national rapid response teams to respond to disease outbreaks. Recommended priorities for action include revision of the national multi-hazard emergency preparedness and response plan and resource mapping.

Emergency response operations

The PHEOC within the Ministry of Health is responsible for coordinating legal and regulatory frameworks between sectors. The PHEOC has conducted a functional exercise to test its handbook and the SOPs related to the coordination of an emergency response. A similar exercise in field-based simulation and a national rapid response team drill have also been conducted. An untested business continuity plan is in force, which enables continuation of operations if the EOC is not accessible. Case management guidelines for other IHR hazards are available at relevant levels of the health system, and SOPs are in place for management and transportation for certain communicable diseases. JEE experts suggest developing a training and exercise strategy and investment plan, and revising the PHEOC handbook.
Linking public health and security authorities

At the national level, there have been two joint training courses on linking public health with law enforcement with support from the CDC. There have been no joint lower-level training courses for the security and public health sectors. Draft MoUs between the Ministries of Health, Agriculture, Animal Industry and Fisheries, Internal Affairs, Defence and Veteran Affairs, and Security are waiting for approval. Uganda has participated in a simulation exercise within the past year that involves leadership from both public health and security authorities.

13. Zimbabwe

National legislation, policy and financing

In Zimbabwe, a Public Health Act is in force, though it is outdated and does not cover all aspects of IHR. A new public health act has been drafted and is awaiting Parliamentary approval. The JEE report highlighted several coordinating structures and committees to support IHR implementation, such as the Inter-Agency Coordination Committee on Health, national rapid response teams, Health Officers Forum, provincial and district zoonotic subcommittees and the civil protection committees (at all levels). These structures are intended to establish linkages across departments and sectors at all levels. A number of cross-border agreements also exist regarding public health emergencies. JEE recommendations focus on systematic and formal assessment of the existing relevant legislation for IHR, expedited approval and enactment of the new public health act and creation of a statutory instrument that will enable designation of the Inter-Agency Coordination Committee for Health.

Workforce development

A workforce strategy that includes key public health professions exists at the country level, as well as a human resources for health strategy, but it does not address all workforce needs for IHR implementation, e.g. animal health. In Zimbabwe, an accredited advanced training system enrols participants from multiple ministries,
including the Ministry of Health and Child Care, Ministry of Agriculture, and Ministry of Defence. However, there is no standardization of competencies or curriculums across programmes, and there are currently many vacancies across all sectors, which cannot be filled owing to the Government’s hiring freeze.

Emergency preparedness

Zimbabwe has a multi-hazard public health emergency preparedness and response plan at both national and subnational level, developed in 2012. Additionally, disease-specific guidelines covering Ebola virus disease, pandemic influenza and others, and guidelines for the EOC and an operational guide exist at the national level. There are strong multisectoral and multidisciplinary coordination mechanisms in place. Simulation exercises have been conducted which can be leveraged to improve preparedness and inform the revision of the national public health emergency preparedness and response plan in line with IHR. The country has yet to undertake mapping of health risks and strategic resources available for deployment. Additional levers include coordinated multisectoral response and resource mobilization for outbreaks and epidemics; strong involvement of all key stakeholder in the response activities and a dedicated workforce for emergency response at all levels. Other recommended priority areas for action include resource mapping, updating of EPRP and dedicated funding for EPR.

Emergency response operations

An EOC is in place in Zimbabwe. While Zimbabwe can mobilize rapidly – often within 24 hours – the procedures for doing so are not well established. JEE experts found that no reference was made to testing of emergency response systems or decision-making to ensure that they are operating efficiently and effectively; and that coordination with the local health system is in place.
Linking public health and security authorities

Zimbabwe has platforms where the security and public health sectors meet to discuss pertinent issues. However, there is a need for improved coordination and written agreements, as well as the conduct of joint exercises and simulations for responding to events involving biological weapons and toxins. Legislation is in place that allows the Government to detain and/or quarantine an individual who presents a public health risk. Data and information from the security and military services are fed into the national health information system and consolidated regularly into the Weekly Disease Surveillance Report.

Absence of a comprehensive multi-hazard and multisectoral national risk profiling

Simulation exercises building on past and neighbouring country experiences conducted

Multi-hazard public health emergency preparedness and response plan at national and subnational level available

Unavailable national EOC plans and procedures

Capacity to mobilize quickly for public health emergency identified
The integration of health systems and health security promotes sustainability, efficiency and effectiveness of a country's preparedness efforts, while also strengthening the wider health system. Strengthening preparedness for prevention, detection and response protects essential health services, contributes to health systems resilience and avoids fragmentation of health systems and health security. One key attribute of resilience is integration and multiculturality, which entails close alignment, cooperation and collaboration of various allied health systems functions and partners. No single entity, agenda or programme can support this alone without complementary support from other functions within and beyond the health sector. IHR capacities, assessed through JEE and other monitoring and evaluation tools and enhanced through the subsequent national action plans, can benefit from systems thinking that integrates and aligns with existing complementary initiatives. Lessons learned by analysing JEE reports and NAPHS include good practices, limitations and recommendations on health systems and health security integration for sustainable health system resilience.

Discussion
The integration of health systems and health security promotes sustainability, efficiency and effectiveness of a country’s preparedness efforts, while also strengthening the wider health system. Strengthening preparedness for prevention, detection and response protects essential health services, contributes to health systems resilience and avoids fragmentation of health systems and health security. One key attribute of resilience is integration and multiculturalism, which entails close alignment, cooperation and collaboration of various allied health systems functions and partners. No single entity, agenda or programme can support this alone without complementary support from other functions within and beyond the health sector. IHR capacities, assessed through JEE and other monitoring and evaluation tools and enhanced through the subsequent national action plans, can benefit from systems thinking that integrates and aligns with existing complementary initiatives. Lessons learned by analysing JEE reports and NAPHS include good practices, limitations and recommendations on health systems and health security integration for sustainable health system resilience.

### Integrated approach to health security and health systems planning

Integrated health security and health systems planning country plans (NAPHS) currently focus on health security capacity in line with the scope of JEE, while there is an opportunity to create strategic and operational linkages between the health sector and healthy security planning processes. Linking health security and health sector planning promotes efficient use of resources since they complement each other in implementation and reinforce health security capacity as integral to resilient health systems. This integration should be implemented across all levels of the health system. Only a few countries’ NAPHS reports referred to reviews of national health sector strategic plans, disease programme- or life course-specific plans, to ensure alignment in NAPHS and health systems planning that enhance linkages between health systems and health security at the planning and policy-making stage.

A good example from the Ethiopian NAPHS involves cross-mapping with the National Strategic Plan and several other allied plans, highlighting areas of health security and health sector integration and including the integration of the planning and budget cycle. Concurrently, the five-year Health Sector Transformation Plan, developed in 2015, emphasizes how health risk emergency management can be improved by strengthening multisectoral coordination.
Improved integration of health systems and essential health services delivery into NAPHS ensures better alignment and harmonization of planned activities with already existing and budgeted plans from other programmes and the wider health sector. It is key for developing and sustaining resilient health systems and services for future emergencies. This integration should also be promoted to other critical health programmes, such as immunization, antimicrobial resistance (AMR), polio, HIV and malaria, and human resources plans, whose critical components in health security were typically not reviewed or considered in the development of the NAPHS.

Recent and ongoing public health emergencies have demonstrated how linkages between preparedness, response functions and essential health services have been critical in case management and in maintaining high-quality routine services during emergencies. To establish a strong foundation at the operational level, such linkages need to be reflected in national policies and planning. Carefully planned organizational arrangements ensure a common thread across all health sector documents, supported by subnational operational plans. This ensures that there is a link between and within instruments of public health legislation to facilitate implementation of national-level strategies.

**Recommendations for consideration**

- To support an integrated approach to evidence-based policies and planning in the health sector to unite, bridge and synergize parallel and complementary planning tools, efforts and investment through sector-wide review processes. This can be supported by legislative and institutional frameworks.

**Integrated governance structures and functions, including subnational stakeholders**

Findings from the 13 countries highlighted different structures and mechanisms to support emergency preparedness and response activities. The associated functions of these structures are not always clearly defined, which could impede timely response and preparedness efforts. Moreover, the role and involvement of health sector and/or health systems offices or directorates within the health emergency governance structures were limited. The data were also too limited to show whether there is a dedicated structure or function on the maintenance of essential health services as part of emergency preparedness, which is a core function of a resilient health system. The absence of such a defined function in the emergency coordination structure was a key limitation identified in the reviewed data.

Experiences in country assessment indicate that public health capacity declines from national to subnational and district levels. Governance arrangements therefore need careful planning and execution at the operational and subnational level, where health systems
respond to emergencies and maintain high-quality essential health services. The case for integration can be enhanced, building on innovative approaches employed by multiple countries that recognize the limited capacity at the subnational level. In examples from Ghana (integrated service delivery teams), Uganda (multidisciplinary and multisectoral district task force) and Kenya (county health management teams carrying out basic IHR functions), embedding public health emergency capacity into multidisciplinary subnational health teams builds local capacity to rapidly detect and respond to any threats. National governments need to consider the inclusion of subnational health management actors in defining policies and health system structures to facilitate translation of legislative instruments to subnational context, social participation and uptake of the policies. In a number of countries, particularly when linking the security sector to the health sector, policies and other formalized arrangements are indicative of the national-level coordination with limited consideration for subnational and service delivery level application.

Decentralization, the transfer of authority from the central level to lower government levels, proved to be beneficial during the west Africa Ebola virus disease outbreak. This could be because reduced chains of authority contributed to faster decision-making and response. Both Liberia and Sierra Leone applied a county and subnational approach in stopping the spread of Ebola. In Liberia, rapid response teams as well as a local EOC were available in all 15 counties. However, this is not the case for all countries. Decentralization, as in Nigeria, has sometimes created an additional layer that impedes the operationalization of national policies. Although there are challenges, decentralization has contributed to subnational/local capacity development for robust public health response and resource mobilization.

In the NAPHS reports analysed in this report, efforts for subnational level capacity development were limited; yet they are particularly critical for federated decentralized health systems in terms of differences in vulnerability, socioeconomic status, health service delivery and context at the subnational level.

The central government has oversight over national response efforts, including those at subnational level, and has a key role in ensuring that response, readiness and lessons learned are harvested and integrated into recovery and long-term health systems strengthening efforts (e.g. in Nigeria).

**Recommendations for consideration**

- To promote an inclusive and sector-wide approach to emergency governance and coordination mechanisms that extend to the subnational level and include defined function(s) in EOCs or a similar response structure for the maintenance of essential health services during emergencies.
One Health approach can catalyse multisectoral coordination

The One Health approach has been adopted and promoted as part of the JEE rollout. This has resulted in frequent references to multisectoral and multidisciplinary engagement (environment, agriculture, food, veterinary sectors) in all the JEE and NAPHS reports for zoonotic events.

In the NAPHS, multisectoral and multidisciplinary involvement was specifically stated in the form of either the participation list or descriptions of involvement throughout the plan. In some NAPHS, this was also highlighted through the elevation of its implementation to the Prime Minister’s Office to allow for inter-ministerial coordination. Although multidisciplinary involvement was highlighted beyond the health sector, engagement between health security, planning, monitoring and service delivery teams within the health sector were ad hoc and limited. Within the health sector, most references were made to emergency or health security related teams within the Ministry of Health and allied sectors. This may remain a persistent challenge to accountability and implementation, as well as monitoring of the planned activities.

In Liberia, the implementation structure of the NAPHS is multisectoral, with the Vice-President chairing the One Health Coordination Platform Ministerial Steering Committee to mobilize the needed resources (domestic and external), ensure political commitment and facilitate collaboration and discussions on human, animal and environmental health. The plan clearly outlines the roles of each Ministry involved in implementation. However, different departments/directorates or offices within the Ministry of Health serve different functions to support the implementation of NAPHS, which were not elaborated within the JEE and NAPHS reports.

Recommendations for consideration

• There is scope to extend the benefit of the One Health approach to other health and life-course-specific programmes, such as the Expanded Programme on Immunization, AMR programme, noncommunicable diseases, etc., as these are adversely affected during protracted public health emergencies.

• To mobilize whole-of-government resources to support capacity-building for emergency management; mandating local governments’ role and support; sustaining dialogue and engagement of political and non-State actors; and supporting private-sector involvement.

• To ensure effective coordination between health-care services, public health, environmental and veterinary sectors for health systems emergency preparedness planning and response.
Robust and predictable financing for planning and sustainable implementation

The data from the 13 countries reviewed indicated that limited national funds are available for IHR implementation. Domestic funding for IHR implementation is often dependent on the total budget allocation for the overall health sector, which in many cases is not sufficient in itself, resulting in reliance on external funding. Although countries in the WHO African Region pledged to increase national health budget allocation to at least 15% of annual budgets in the Abuja Declaration of 2001, little progress has been made to date. As of 2011, only three of the 46 countries (6.5%) were deemed to be on track to implement this pledge, 16 countries (35%) were making progress and 27 countries (59%) had made insufficient progress (25). Only two countries reviewed, Pakistan and Uganda, reported on domestic allocations to support IHR implementation within the JEE. For example, Uganda reported a 3.5% allocation of its national budget for emergencies, pursuant to the mandate of the Public Finance Management Act of 2015. Additionally, Pakistan reported allocating less than 1% of its gross domestic product to health, of which a major share is spent on the workforce.

The lack of domestic funding to support IHR implementation and wider health security efforts has multiple implications. These can include: inadequate mapping and procurement of essential commodities for routine service delivery and stockpiles for emergency preparedness; limited training, supervision or even ability to retain human resources to deliver on the package of essential health services and adhere to IHR; and weakened surveillance and information-sharing to detect any threats. In the data reviewed in this report, support from external donors was mentioned, particularly for the field-based epidemiology programme. In countries where government ownership was reported for the field programme (i.e. the FETP or FELTP embedded within the Ministry of Health), the operational costs of running the programmes are borne by donors. A similar narrative is reported for national EOC programmes. The limited domestic funding and reliance on external support, which can be unpredictable and fluctuating, reduces the sustainability of the efforts outlined in the plans. Analysis of NAPHS reports also revealed that countries did not explicitly identify the existing and anticipated sources of funding to implement the plan. This presents uncertainty and reliance on external sources to support the planned activities, placing the operationalization of the plan at risk. Despite good processes and plans, the lack of reliable and consistent funding to support the implementation is a significant risk. In addition, there was no mention of cross-mappings conducted between activities planned in NAPHS, and those already budgeted in health sector planning or complementary disease or programme specific plans, in order to identify areas of cost duplication, and potential areas
of synergy for a greater and streamlined impact. This inadequate resource mapping is another missed opportunity to streamline the already limited resources for maximizing impact.

Recommendations for consideration

- There is a need to increase funding for emergency preparedness, which should be part of strengthening the national public health systems and resilience.

- To promote resource mapping across multiple health sector and health security programmes, to foster integration and alignment and streamline technical and financial resources. The investment and capacities for health security should form part of national health system development, including continued and close engagement with ministries of finance and with allied sectors.

Application of lessons from previous outbreaks

One key attribute of a resilient health system is the ability of countries to feed lessons learned from past events into building back better. This can take place in various forms. For example, Liberia and Sierra Leone have applied lessons learned during the Ebola outbreak in developing their investment and recovery plans, drawing on experiences from this emergency to the recovery and transformation. Similarly, the ERPs in both countries build upon the proven strategies applied to stop the spread of Ebola virus disease. Learning is not only captured in policies and plans, but also exhibited in established structures and functions for the EOC in Liberia, particularly in the way these functions now present multisectoral and multidisciplinary approaches to emergency management.

In west Africa’s most populous country, Nigeria, experience with polio in the north has contributed to the ability to halt the spread of Ebola. Experiences gained from polio eradication programmes have been utilized in the training curriculum of the national field and laboratory epidemiology programme. Similarly, Pakistan has used experiences emerging from its polio programme to inform efforts in health emergency and long-term health systems planning. However, most examples of using lessons from previous emergencies have focused on national preparedness and response functions, and data were limited for ascertaining their application to subnational level capacities and broader health systems functions.

Applying lessons learned and sustaining best practices from past outbreaks were shown to be challenging in some contexts, as is the case in Ghana where a cross-sectoral interministerial cabinet was disbanded following its success during the Ebola outbreak (26). Similarly, in Bangladesh, though capacities developed from past disasters are institutionalized across various ministries, it is not clear how they are being scaled up, adapted and sustained for enhancing preparedness in the long term. Sustaining gains made from past outbreaks requires focused efforts from national
governments on learning alongside a dedicated, well-resourced research agenda ensuring that experiences from the front line are captured, evaluated and disseminated across subnational, national and regional levels to improve health system performance. Evaluating the effectiveness of interventions requires a multisectoral approach involving those within and outside the health sector including communities. There are opportunities for countries to learn from the use of multiagency coordination and the whole-of-government approach in past outbreaks and the ongoing pandemic to plan for more integrated health systems development in the future.

**Recommendations for consideration**

- To place the learning agenda as part of post-event evaluations and at the core of resilience efforts at all levels of the health and allied sectors.
- To promote effective participation of health systems and wider sectors in post-event evaluations and subsequent planning typically led by health emergency unit/focal point.
- To document and leverage lessons learned from previous emergencies to inform recovery and subsequent preparedness efforts to build better, more resilient health systems.

**Health workforce – availability, retention and distribution**

Health workers are the backbone of health systems. Challenges surrounding human resource capacity, competence, maldistribution, appropriate mix of cadres, attrition and retention were reported in the JEE reports and subsequent NAPHS. Human resource capacity is limited, with countries reporting a lower ratio of health workers to population than that recommended by WHO, especially in rural or undesirable locations. When workforce density is further stratified, even lower numbers were reported for public health workers. Zimbabwe, Pakistan and Uganda recorded adequate numbers of medical professionals, medical disciplines and epidemiologists, respectively.

Health systems strengthening and health security integration can be particularly important in the context of the health workforce. For instance, there is an opportunity and need for pre-service education and regular continuing professional development to integrate training on the animal-human interface and public health to ensure that adequate capabilities are available in-country for early notification and preparedness and for maintenance of high-quality essential health services.
Another important area to support integration is the work on essential health service packages available in countries. In Malawi, the essential package of health services, which outlines the services the country will provide at various levels of the health system, is aligned with its health workforce strategy, highlighting key considerations for health workforce capacity planning for the packages of health services. In Pakistan, a large workforce of community health workers (lady health workers, migrant workers, etc.) exists to provide primary care services as part of the defined package of service. Revisiting the package of essential health services to include public health and animal-related conditions can facilitate the creation of a multipurposed health workforce within these areas and identify possible retention strategies.

**Recommendations for consideration**

- To align health workforce strategies more closely with health security strategies and build the health security workforce as part of national health workforce development.

- To invest and leverage the primary health care workforce to complement needs emanating from increased demands during public health emergencies and shifting health needs.
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Recommendations for consideration
• To align health workforce strategies more closely with health security strategies and build the health security workforce as part of national health workforce development.
• To invest and leverage the primary health care workforce to complement needs emanating from increased demands during public health emergencies and shifting health needs.

Feasibility of JEE and NAPHS processes in promoting integration
There have been several process limitations in the JEE and the development of the NAPHS that contribute to the limited integration of health systems and health security efforts. A number of these process limitations are summarized below; however, they may vary between countries and contexts.

**Composition of the JEE and NAPHS team**

JEE and subsequent NAPHS are, in general, led by experts in the JEE technical areas. The participation of health systems background experts from country and partners is not identified as a requirement in the current practices. However, this review has identified that their participation would be beneficial and ensure consideration of the health systems perspective in assessing, planning, budgeting and integrating the gaps as part of national health sector development, with other allied public health sectors.

**Variation in and inconsistency of NAPHS reports**

The reviewed NAPHS documents showed variability in their content and structure across the various countries. Some included a mapping or review of the health sector strategic plans as well as other programme, disease and population specific plans, while others had a situational analysis including a risk profile and JEE results. Not all reports included a summarized list of planned activities (e.g. Ghana). Not all NAPHS of 13 countries are released in the public domain. This variation or limited detail in the reports presents challenges for ascertaining the extent to which an integrative approach has been adopted in health systems, security and other programmes in the processes and content of NAPHS. This lack of standardisation also presents a challenge when supporting countries in fostering health systems-security alignment in planning and programming.

**JEE technical area objectives and country data**

Currently, data presented in the JEE reports address identified JEE technical areas and sub-indicators captured within the tool. Thus, the data from countries follow the prescribed tool which has a limited scope to inform the systems-security interface. In reports where national baseline capacities are provided, i.e. addressing the broader health systems environment, the findings and identified recommendations (e.g. in Ethiopia where the mention of the health sector transformation plan was noted as a foundational component to the assessment) provided useful levers for systems and security integration.

**Representation of baseline national capacities and future coverage**

The composition, consistency and correspondence across the JEE technical areas appeared to have an impact on JEE recommendations. Across the 13 countries, JEE recommendations were heavily skewed towards leadership and governance, with over half of all recommendations focused on this area, while there are still only limited data to ascertain the degree to which legislation and policy for health security are already
in place or have still to be developed and how they underpin a wider systems approach for public health.

Nearly one fifth of the remaining recommendations focused on the health workforce; only 3% were related to access to essential medicines. This limits the information available for setting the baseline and determining the need for multisectoral development of health systems resilience for response and uninterrupted high-quality health services.

**Acknowledging and managing NAPHS implementation challenges**

A good functional plan needs acknowledgement and management of major policy, funding, tactical and technical risks and expected barriers to implementation, and also requires proactive mitigation measures to be in place. These are currently lacking in the majority of NAPHS documents.

In Liberia, limited collaboration among key stakeholders in NAPHS was identified as a potential barrier in its implementation. The plan does not, however, adequately address mitigation measures for this risk, particularly in the implementation structure and function of the plan. Moreover, lack of governance, political support and buy-in were also noted as potential challenges in implementation. This situation was reflected in the JEE recommendations, namely to “raise awareness among all relevant stakeholders about their roles and responsibilities related to the IHR (2005)”. Similarly, across the countries, most NAPHS reports do not clearly highlight the anticipated implementation risks and mitigation strategies. The dependence of these plans focuses mostly on external financial resources, evident from the lack of identification of domestic budget lines. This is of concern and a significant barrier to implementation. None of the plans had a detailed identified source of funding to support implementation.

Moreover, the multisectoral nature of IHR implementation is itself a challenge. Although a good practice, this may create a situation of lack of accountability by other entities if they fail to identify their role in the plan implementation. To mitigate this, a number of plans have set and identified an oversight role for the Prime Minister or President’s office, with terms of reference for each entity. This proves to be an enabler to ensure effective inclusion, coordination and accountability for the planned priority areas.

Another potential barrier, particularly for countries with decentralized administrative structures (e.g. Ethiopia, Nigeria and Pakistan), is limited health sector financing and heterogeneity in distribution between the regions to implement the plan adequately. Different regions also have different risk profiles and unique financial and political challenges. As such, a tailored operational plan that accounts for this variation is better implemented than only a centrally driven plan.

A cross-cutting enabler to effective implementation of the plans is the integrated approach to planning. This means ensuring all health sector plans (health security plans including polio); disease- and population-based plans
(e.g. AMR, immunization programme) are well aligned and financially streamlined. Alignment of all sector plans would help to avoid double costing of activities and promote harmonized operational structures and implementation of all the plans.
Conclusion
As public health emergencies continue to highlight the vulnerability of health systems across the world, the need for health systems strengthening and health security integration to regain, achieve and sustain progress towards UHC by protecting and promoting public health is more evident. This review highlights the important role of health security assessments and planning in promoting cohesion and consistency in integrated systems and security. The current vertical planning and external support for Member States has contributed to the persistence of a siloed approach between systems and security capacity development.

While the JEE and NAPHS are useful tools and processes to inform and address health security capacity gaps, they are insufficient on their own at present to drive health security-systems integration agenda within countries. Commitment from the global health community, coupled with country level technical and political buy-in is crucial. Moreover, the successes and political uptake of JEE across the globe, followed by the development of the NAPHS can only yield the desired results and sustainability if they are embedded in a systems and public health approach. A global and national drive for a unified health systems strengthening ought to be facilitated through continuous and collective efforts at a global policy, national and operational level. This would cascade to supporting countries with aligning health systems, health emergencies and disease and life-course programmes together across all levels of the health system.

The ongoing global pandemic has been a litmus test, further highlighting existing gaps in systems security integration, offering opportunities for multisectoral and multidisciplinary coordination. This has complemented the strong evidence base, supporting the case for improvement in the way countries approach IHR implementation, and likewise UHC, from policy and planning to the operational service delivery level.
References
A review of joint external evaluations and national action plans for health security in 13 countries from a health systems perspective


22. This includes one mandatory component which is the States Parties Self-Assessment Annual Reporting (SPAR) and three voluntary components, namely, after-action review (AAR); simulation exercises (SimEx); and voluntary external evaluation, commonly referred to as the Joint External Evaluation (JEE).


Annex. Country JEE and NAPHS by year
<table>
<thead>
<tr>
<th>Country</th>
<th>NAPHS</th>
<th>JEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bangladesh</td>
<td>NAPHS conducted, not yet published</td>
<td>May 2016 (public)</td>
</tr>
<tr>
<td>2. Ethiopia</td>
<td>March 2019–2023 (not public)</td>
<td>March 2016 (public)</td>
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<tr>
<td>5. Liberia</td>
<td>2018–2022 (public)</td>
<td>September 2016 (public)</td>
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<tr>
<td>6. Malawi</td>
<td>NAPHS conducted, not yet published</td>
<td>February 2019 (public)</td>
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<td>7. Nigeria</td>
<td>2018–2022 (public)</td>
<td>June 2017 (public)</td>
</tr>
<tr>
<td>8. Pakistan</td>
<td>High-level statement (December 2016)</td>
<td>May 2016 (public)</td>
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<tr>
<td>9. Sierra Leone</td>
<td>2018–2022 (public)</td>
<td>November 2016 (public)</td>
</tr>
<tr>
<td>10. South Sudan</td>
<td>NAPHS conducted, not yet published</td>
<td>October 2017 (public)</td>
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<td>11. Tanzania (United Republic of) (mainland)</td>
<td>2017–2021 (public)</td>
<td>February 2016 (public)</td>
</tr>
<tr>
<td>12. Uganda</td>
<td>August 2019–2023 (public)</td>
<td>June 2017 (public)</td>
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<tr>
<td>13. Zimbabwe</td>
<td>NAPHS conducted, not yet published</td>
<td>February 2018 (public)</td>
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