Public Health Institutes of the World

IANPHI

Role of NPHIs in Health Emergencies

Executive Summary

NPHI national health emergency corps survey and connected leaders' interviews 2024-2025

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Abstract

The COVID-19 pandemic exposed significant failures and gaps in international and national responses to an emerging pandemic threat. The Independent Panel on Pandemic Preparedness and Response (IPPR) in 2021 concluded that "current institutions, public and private, failed to protect people" from the pandemic and called for transformational change to a new system that is coordinated, connected, fast-moving, accountable, just and equitable" [1]. Despite some progress in recent years, in 2024, the IPPR concluded that "the world remains unprepared to stop an outbreak from becoming a pandemic" [2]. Following these longstanding calls for action and learning from the pandemic as well as other health emergencies, the Global Health Emergency Corps (GHEC) was devised and launched in May 2023 as a strengthened approach to collaboration for countries and health emergency networks [3].

The aim of GHEC is to create collaborative networks at the national, sub-national and community levels, across the health system and across sectors. This is to enable a workforce of professionals across governmental and non-governmental sectors that can be called upon and mobilised. These professionals have the expertise, skills and competencies to respond to public health emergencies, across a range of activities from forecasting and predictive intelligence, early warning to mobilising public health action on the ground when needed.

The signing of the pandemic agreement paves the way for focus and much needed investment in strengthening prevention, preparedness and response for pandemics caused by infectious diseases but the principles apply to all public health emergencies where the spread of all diseases are a factor in health emergencies [4].

With funding from The Gates Foundation IANPHI conducted a survey with its 127 members and undertook interviews with a select group of leaders. The survey with IANPHI members focused on the role of National Public Health Institutes (NPHIs) in health emergencies, and particularly on the deployment and surge of the health emergency workforce. A 47% response was received across regions. In addition, interviews were held with 15 NPHI leaders, including two subnational directors and one regional multi-country public health agency director to understand the current state of the interactions, relationships and strength of connected leaders within the country from national to community level. The interviews also sought to understand how leaders engage with neighbouring countries, regional entities or internationally to expedite access to intelligence, support and agree actions that are mutually beneficial to prevent spillovers across borders and prevent epidemics from becoming pandemics, and to enable timely response to protect borders.

There is significant contextual variability between countries and NPHIs such that it is unlikely a one-size-fits-all framework can be devised that fits all circumstances. The survey and interviews demonstrated that even though NPHIs are the recognised institutes for public health in their countries there is still variation in their mandates and authorities. NPHIs who have surveillance and specialist laboratories under their functions will be responsible for providing services in the lead up to and during health emergencies. Most NPHIs will act as evidence-driven trusted advisors to governments and other sectors.

The abilities of NPHIs to respond highly depends on several key elements:

- legal and political mandate to operate;
- resources including human resources and funding;
- mechanisms and procedures for response;
- a functional health system and infrastructure by which a response is delivered;
- and connected leadership working through collaborative networks of networks.

Some NPHIs do not fulfil all the functions in the domains of the emergency management cycle and tend to have limited operational roles within health emergencies. This is partly because they are organisationally restricted by their remit and mandate, size and workforce. They are supportive of government actions primarily through the Ministry of Health. They hold the mandate for providing independent evidence-based policy advice aligned to disease surveillance, prevention, public protection and promotion of health and well-being. In health emergencies the Ministry of Health has the primary role for operational and mitigation action.

Key operational functions of NPHIs include:

- specialist laboratory testing – in health emergencies this will include working with the health sectors on contact tracing, testing and diagnostics;
- surveillance of infectious diseases during health emergencies when these are primary or secondary causes of spread of diseases (such as from flooding, extreme heat, pollution) and the monitoring of secondary impacts of epidemics and pandemics such as food and shelter insecurity;
- epidemiological expertise applied to investigational activity, surveillance and contact tracing analysis;

- and providing specialist scientific and technical expertise, guidance and policy advice.

Notably, NPHIs in low-income countries tend to lead on the coordination of emergency response, mounting a field response, and related functions (emergency planning, emergency training, emergency needs assessment, evaluation of response). However, NPHIs tend not to be involved in disaster recovery planning, the mobilization of field response such as emergency health services, or post disaster debriefing and lesson learning. Some of the key public health workforce challenges reported by NPHIs from all regions included training, funding, workforce planning and staff retention.

In public health emergencies, NPHIs often act as trusted connectors who bridge the gap between the health and non-health sectors. Effective leaders are seen as those who possess decision-making authority and the ability to allocate resources, as well as the ability to influence across sectors, helping bridge health with broader national security and socio-economic agendas. Strong leadership is seen not just in operational command but in providing a unifying vision that reinforces the importance of public health as a national priority, and not just solely a health sector concern.

Connected leaders optimise key professional and organisational networks to enable a co-ordinated and accelerated response, that includes timely information and intelligence exchange through formal and informal agreements, shared understanding of risks and impacts, and common purpose to deliver mitigation actions that protect health and economic security across borders and regions. For leaders, clear responsibilities and delegated authority from government, with clear recognition of other contributing in-country sectors in health emergencies enables clarity of roles and remit, and enables the building of effective relationships. Much of this is influenced by the country context, mandates and authorities and how the NPHI functions.

Key recommendations included:

1. **Legal and Political Mandates**
   There is an urgent need to formalise and clarify the roles of NPHIs in public health emergencies. Recommendations include strengthening political advocacy, integrating NPHIs into national emergency governance structures, and monitoring political economy risks that may hinder effective response.

2. **Resourcing and Workforce**
   Developing a recognised, multisectoral health emergency workforce that is interconnected is critical. This involves embedding normative practice that enables seamless activation during health emergencies. This includes mapping core competencies, addressing capacity gaps, implementing rapid assessment tools, and establishing a national emergency corps that spans community to national levels. Investment in multisectoral workforce strategies and surge mechanisms will enable agile and scalable responses.

3. **Mechanisms and Systems**
   Operational readiness requires strengthened cross-border preparedness, surge planning, coordination mechanisms, and the use of technology. A dynamic deployment register, paired with training and simulation exercises, is essential for maintaining a flexible and responsive emergency workforce. NPHIs should lead efforts to integrate system strengthening experts into emergency response governance.

4. **Leadership and Global Engagement**
   Strategic leadership is central to transforming emergency response. Recommendations call for embedding NPHI leaders into national security and cross-ministerial structures, enhancing global peer networks, and building connected leadership through stakeholder engagement and diplomacy training. NPHIs must be empowered as national and regional bridge-builders, translating global frameworks into context-specific action.

Introduction

National Public Health Institutes (NPHIs) hold a unique position and function in the public health emergency ecosystem. Through their mandates many NPHIs are part of government at the national level and function at the intersection of sectors that have operational roles in a health emergency. NPHIs provide their expertise and advice primarily to government using evidence-based approaches. The Global Health Emergency Corps (GHEC), with the secretariat at the WHO, is a network of networks which aims to provide a framework that will enable a co-ordinated approach to prevent and respond to health emergencies in a way that reduces the impact of health emergencies on populations.

GHEC is a framework for enhancing health emergency workforce capacity within health emergency prevention, preparedness, response, and resilience (HEPR) work [5]. It is a collaboration platform for countries and health emergency networks and integrates with the existing International Health Regulations as well as WHO's updated HEPR framework [6, 7]. GHEC comprises of a network of networks including IANPHI, EMT [1], GOARN [2], SBP [3], WHO regional offices and country offices, supranational Centers for Disease Control and Prevention (CDC), EOC-Net[4], TEPHINET[5] and Health Cluster.

The national public health emergency workforce has an intimate knowledge of their context, including the specific needs, challenges and gaps. Working through their NPHIs, countries can leverage through connected leadership additional support via established bilateral, regional and international partnerships. The organisation of such a national health emergency corps will enable a co-ordinated mechanism for the deployment of staff and resources as well as the ability to surge expertise and resources that are needed during health emergencies.

With funding from the Gates Foundation and in consultation with the GHEC secretariat, IANPHI conducted a survey with its members on the role of NPHIs in health emergencies with a focus on the deployment and surge of the health emergency workforce. In addition, interviews were held with 15 NPHI leaders, including two subnational directors and one regional multi-country public health agency director to understand the current state of the interactions, relationships and strength of connected leaders within the country from national to community level. The interviews also sought to understand how leaders engage with neighbouring countries, regional entities or internationally to expedite access to intelligence,

1 Emergency Medical Teams

2 Global Outbreak Alert and Response Network

3 Standby Partnership Network

4 Public Health Emergency Operations Centre Network

5 Training Programs in Epidemiology and Public Health Interventions Network

support and agree actions that are mutually beneficial to prevent spill-overs across borders and prevent epidemics from becoming pandemics, and to enable timely response to protect borders.

An initial workshop was held in February 2025 to discuss preliminary data that included a session with the GHEC secretariat, GOARN and the chair of the IANPHI Pandemic Preparedness Response and Recovery Thematic Committee. During the IANPHI Annual Meeting in Maputo, Mozambique in April 2025 a session was held with the attendees to present the findings which included an interactive session to discuss connected leadership. A short description of the methodology can be found in appendix 2.

What we Found

Legal and political enablers are essential

The legal and political contexts were clearly foundational enablers—or constraints—on the effectiveness of NPHIs, particularly during health emergencies and in global health engagement. Where political support is weak or dependent on individual champions, NPHIs may face operational limitations or fragile mandates. Political buy-in is also essential for translating strategic intent into actionable policy and resourcing.

Surge capacity is limited by existing mechanisms and resourcing

The capacities of NPHIs and health systems are highly contingent on the extent of their resourcing. Similarly, the surge capacities of national systems rely on the pre-existing resource envelopes for NPHIs and health system providers. To this end, there may be value in mapping what NPHIs can offer - what are the shared assets, especially at the regional level, that could be brought to bear in an emergency. It also highlights the need to strengthen domestic funding, and ensure it is sustainable, sustained, and longer term.

Human resources for public health emergency response was a frequent problem for which there were different considerations: sufficiency of numbers of staff, skills, and competencies. Several NPHIs described not having enough staff (especially trained staff), particularly to deploy for a prolonged length of time. NPHI involvement in workforce strategies and planning are patchy that may leave gaps in readiness.

Narrow range of NPHI responses to emergencies

Most NPHIs are well-positioned in scientific and technical leadership functions, but their operational role in emergencies varies. The scope of work for many NPHIs is often focused on infectious disease threats, particularly in low-income countries, and do not cover the full range of hazards (e.g., chemical, biological, radiological/nuclear, etc). It is also does not span the full emergency management cycle with notably less involvement in post-emergency recovery and lessons learning aspects. NPHIs in low-income settings are more involved in field response, possibly due to weaker health system infrastructure. NPHI remits do not always include water and sanitation, or animal health, which will have implications for One Health.

Deploying a response internationally is challenging

The key challenges to mobilizing national and international surge capacity include logistical barriers, lack of protocols, coordination problems, and staff shortages. LICs tend to struggle with the lack of plans and budget, whilst HICs experience more coordination issues. Across all levels (national, regional, international), the top priorities for strengthening emergency deployment identified were for resources (especially funding), workforce (capacity and expertise), deployment planning and coordination. Streamlined, established and well-rehearsed mechanisms for requests for technical assistance and surge deployment are needed. Some of these already exist (e.g., GOARN) and duplication should be avoided. These mechanisms need to also be universally agreed, transparent and accessible. It is also important to understand what 'receiving' NPHIs need in emergencies, how best to deliver that support, whether that support works, but also whether that support was needed or reflected what NPHIs were able to send.

Collaborative, connected leadership is key

The findings underline the importance of connected leaders, strategic partnerships, and robust learning systems in health emergency preparedness and response. Experienced, senior leadership is often required in emergencies, collaboratively working in partnership with Ministries of Health, government agencies, and other disaster response partners. Such leadership connections exist at all levels from subnational, national to international, and are also evident in NPHI-NPHI collaborations. However, the nature of the leadership connections is organic and patchy. There needs to be spaces and opportunities for collaboration to take place to build those relational links between leaders, NPHIs and partner agencies.

Key recommendations

The analysis highlights persistent variations in the mandates and authorities of NPHIs across countries. While many are recognised as national reference bodies, their formal roles in emergency governance often lack clarity, limiting their influence and integration into decision-making processes. Based on the findings and insights of this work, a series of impactful recommendations are proposed as follows:

Four key thematic areas emerged with recommendations for action:

1. Legal and Political Mandates

- Clarify the mandates of NPHIs and other partners for public health emergency management, and strengthen political advocacy for the role of NPHIs in managing public health emergencies.

- Monitor and analyse political economy risks that may hinder effective inter-agency working.

2. Resourcing and Workforce

- Identify the skills and competencies required, and strategies to address gaps, for the national health emergency workforce. This includes expertise required from in country professionals for deployment and surge at national, subnational and community level, as well as expertise and resources required from international sources.

- Develop a recognised cadre of trained multisectoral national health emergency workforce (national health emergency corps) that is assimilated under one collaboration and can be called upon when needed. This cadre of professionals needs to be identified at all levels (from community to national) and working across sectors.

3. Mechanisms and Systems

- Enhance coordination mechanisms both nationally and internationally, for example through conducting cross-border emergency preparedness exercises to strengthen coordinated regional responses.

- Develop and fund comprehensive surge plans, including deployment and surge register with attached training plan which is multi-sectoral and updated by NPHI (or other lead agency for public health emergency activities).

- Explore the role of technology to support health emergency response.

- Integrate system strengthening specialists into health emergency management systems with strategic oversight of partnership, joint collaboration and action.

4. Leadership and Global Engagement

- Formalize the role of the NPHI for all public health emergencies, including participation in national-level decision-making to amplify their influence and visibility. Position NPHI leaders strategically within national governance structures (e.g., national security councils, cross-ministerial task forces).

- Include leaders from NPHIs on global networks, expand support networks and develop communities of shared practice, particularly for low-income countries. Support NPHIs as local translators of global frameworks, ensuring emergency systems align with sociocultural norms, infrastructure, and community needs.

- Global leadership development in health emergency management that links NPHI leaders to peer networks and strategic mentorship is needed. Train NPHI leaders in stakeholder engagement and diplomacy to strengthen collaboration with sectors like disaster management, defence, and finance.

- Strengthen global norms for public health emergency response, particularly for multi-sectoral and cross border collaboration as normative practice. Build bridges through simulation exercises for cross border strengthening. Investment in joint training, twinning, peer review, and simulation exercises to foster reciprocity, solidarity, and peer support.

The survey and interviews demonstrated that even though NPHIs are the recognised institutes for public health in their countries there is still variation in their mandates and authorities. NPHIs who have surveillance and specialist laboratories under their functions will be responsible for providing services in the lead up to and during health emergencies. Most NPHIs will act as evidence-driven trusted advisors to governments and other sectors.

Connected leaders' networks need to be strengthened to create a network of networks that operates according to country context. NPHIs should lead this endeavour as bridge connectors, authorised by government, and should not be restricted at the national level unless subnational investment is robust for health emergency detection and prevention, in which case collaborative networks from national to subnational levels become critical. Leaders need to be well equipped and skilled to be able to step outside of the zones of science to find common drivers that resonate to build collaborations in times of normative practice. Governments need to provide NPHIs with those levers that enable NPHI leaders to be part of the wider intergovernmental dialogue that impacts health security.

Ultimately, the recommendations advocates for NPHIs as central actors in and interconnected, multi-sectoral national and global health security architectures. Strengthened mandates, resources, mechanisms, and leadership are essential for enabling NPHIs to act as trusted, evidence-based institutions capable of guiding equitable, effective, and coordinated responses to future public health emergencies.

Call for Action:

A call for action can be found in appendix 1. Every country is different; therefore activities need to be tailored to the specific next steps and country context. Country specific plans linked to already established plans through other mechanisms such as JEE, SPAR etc need to be considered and integrated to avoid duplication.

There is also benefit from peer-to-peer support and evaluation including cross border collaboration and support.

Conclusions

There is considerable variability between countries in terms of context, legal mandates, and authority for NPHIs, capabilities, processes, and experience of mobilising surge capacity to national and international public health emergencies. This implies that a one-size-fits-all approach is unlikely to work, and tailored, country-adapted approaches are needed. Key to effective pandemic control would be early detection, confirmation of the pathogen and early public health intervention. This requires multi-sectoral and multi-agency responses be it at the subnational, national, or international levels. For example, health providers/health system are key for the early reporting, sample taking through to response. NPHIs play a key role in this chain of action and response through provision of specialist scientific and technical advice, surveillance, and specialist laboratory facilities/ testing, that help inform both health providers, policymakers, and decisions. Consequently, it is vital to ensure NPHIs are developed, resourced, and empowered to fulfil that function.

However, there are significant gaps and challenges experienced currently by NPHIs. There is limited surge capacity within countries let alone internationally, that limit to what NPHIs can deploy. The current approach to responding to public health emergencies tends to be quite reactive and the prevailing view is that not enough is done on public health system strengthening in the inter-crisis period. There is a pressing need for further work on developing surge mechanisms and exercising how countries surge and deploy, particularly in support of other countries or for cross-border issues. Most NPHI to NPHI and bilateral interactions tend to be with neighbouring countries and countries within the same continental region. Consequently, if the aim is to strengthen international collaboration, a natural starting point would be to foster and develop cross-border collaborations. This could be through greater interactions and trusted relationships at various levels of NPHIs, such as through cross-border simulation exercises or other joint projects.

Finally, connected leadership in health emergencies refers to a leadership approach that emphasizes collaboration, communication, coordination, and relationship-building across various sectors, organizations, and communities to effectively manage and respond to crises like pandemics, natural disasters, or other public health threats. It is made up of a network of people, working in different places and at various levels, with a common purpose, and cooperating to deliver a coordinated response or make a system level impact. For it to be effective, relationships and trust are needed as systems can only move forward at the speed of trust. Connections between public health agencies can be established and strengthened at the various leadership levels (i.e., building "connected leadership") and through scientific, technical, and professional networks operating in a "network of networks." This would serve to enhance information and intelligence exchange that benefits greater situational awareness, the sharing of good practice and lessons learned that improves effective practice, and the facilitation of collaboration where needed for coordinated responses. In doing so, global health security systems are strengthened and therefore the ability to stop the next pandemic.

NPHIs are uniquely positioned to lead evidence-based, coordinated responses to health emergencies. However, to fulfil this role, they must be legally empowered, sustainably resourced, operationally connected, and globally engaged. Implementing the recommendations in this report will ensure that NPHIs can act decisively, build resilience across systems, and protect populations before, during, and after crises.

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We would like to express our deepest gratitude to the directors and senior executives who participated in the interviews as part of this project. Their valuable contributions provided a deeper understanding of the concept of connected leadership in the context of public health emergencies. Through these discussions, we gained important insights into how strategic decision-making is enhanced by strong connections across different levels—country, regional, and global. Their perspectives on the role of formal and informal networks, partnerships, and collaborations underscored the importance of integrated leadership in fostering cross-border and transnational agreements. The emphasis on maintaining these relationships through normative practices highlighted how connected leadership is essential for creating a unified, efficient approach to both health emergency preparedness and response.

Appendix 1: Call for Action

Every country is different, in terms of context, health system organisation, processes and NPHI remits for public health emergencies. Consequently, there is no universal model, and each country will need to tailor and adapt public health emergency planning from emergency preparedness to surge response and deployment to suit their country-specific context. Such planning would benefit from peer-to-peer support, knowledge exchange and the sharing of experience, as well as collaboration particularly for cross-border and international response to public health threats. Moreover, multisectoral and multiagency responses are required and hence various actors, with differing remits, powers, and resources, are involved. In the call for action table below we identified areas for action to strengthen national health emergency workforce and surge required to respond to public health threats, based on the findings from this IANPHI project. In the lead/responsibility column, we have indicated which of the actors has responsibility for leading the implementation of these actions.

A. Legal and political mandates

Areas for Action	Aim	Stakeholders	Activity	Lead/ Responsibility	Expected Output	Expected Outcome
1) Clarify the mandates of NPHIs and other partners for public health emergency management	Clear roles and responsibilities for all agencies involved in public health emergency management	MoH, NPHI, WHO, Regional CDC	i) Map all roles and functions spanning the emergency management cycle. ii) Countries ideally need to codify the emergency response roles and responsibilities, including supporting national legislation and policy. iii) Build partnerships and strengthen cross-sectoral collaboration.	MoH	i) Defined roles for all agencies involved and national structures for public health emergency management. ii) Supporting legislation that provides the legal mandates for key agencies, including the NPHI. iii) Norms for multi-agency partnership working in emergencies.	National public health emergency management activity occurs seamlessly, and responds efficiently and effectively to public health threats
2. Strengthen political advocacy for clear public health emergency management role of NPHIs	Ensure NPHIs have the political support to engage in public health emergency management	MoH, NPHI, WHO, Regional CDC, IANPHI	i) Develop and implement an engagement plan targeting high-level policymakers, tailored to each country's governance structure. ii) Develop, share and use case studies of successful, politically empowered NPHIs. iii) Develop communities of shared practice to facilitate active knowledge management and dissemination.	NPHI, IANPHI	i) NPHI responsibilities and activities, are strategically aligned and supported by government policy. ii) NPHIs and MoH enabled to make the case to government and political stakeholders for the key functions NPHIs provide in public health emergency management.	NPHIs have the political support and long-term commitment, working in conjunction with MoH to build public health capacity, strengthen the public health and emergency management system.
3. Monitor and analyse political economy risks	To enable awareness and agility to political and policy changes impacting national emergency response capabilities	NPHI, MoH, IANPHI, WHO	i) Integrate political economic analysis into NPHI development, expansion or reform projects. ii) IANPHI or WHO could develop a rapid political context assessment tool for use by NPHIs/MoHs in national public health emergency management planning. This can form part of the emergency needs assessment for a country.	NPHI / IANPHI / WHO	NPHIs proactively identify and address potential barriers stemming from political rivalry, resource competition, or ideological resistance.	Measures can be put in place to mitigate potential political barriers to NPHI activity in public health emergencies

B. Resourcing and workforce

Areas for Action	Aim	Stakeholders	Activity	Lead/ Responsibility	Expected Output	Expected Outcome
4. Establish a register of a multi-sectoral health emergency workforce professionals that could be needed during a health emergency	Establishing an understanding of the types of expertise and professions that enable response for health emergency situations	MoH, OneHealth stakeholders, academic, national organisations (public, private), civil society	i) Identify a list of the professionals that would be engaged in a public health emergency. ii) Disseminate the list to organisations that could identify key roles within their organisation that could provide support in a national public health emergency	MoH/NPHI	Comprehensive list of the location of health emergency workforce on national, subnational (district, provincial, regional) level.	In times of health emergency surge of professionals that can support response and identification of gaps that can then be requested through international networks
5. Identify the skills and competencies required, and strategies to address gaps, for the national health emergency workforce	Achieve a recognized multisectoral cadre of national health emergency workforce that can be called upon to respond to public health emergencies	MoH, NPHI	i) Identify current public health emergency workforce (in terms of numbers, roles, skills, and competencies). ii) Identify and map national public health workforce staffing gaps and needs. iii) Review the need for standardization of qualification requirements for key roles. iv) Advocate for minimum competency and certification standards in emergency planning and management roles. v) Invest in regional and local training infrastructure. vi) Encourage partnerships with academic institutions and regional bodies to expand access to high quality training required.	MoH, NPHI	Comprehensive national picture of staffing skills and capacity gaps and needs. Standardization of skills, competencies and certification of the public health emergency workforce. Strengthened training infrastructure and provision of high quality training.	Workforce mapping guides longer term strategic workforce planning to address gaps and needs. The public health emergency workforce is better trained and their skills and competencies are standardized.

Areas for Action	Aim	Stakeholders	Activity	Lead/ Responsibility	Expected Output	Expected Outcome
6. Support the development and updating of workforce strategies	Address key systemic workforce challenges through supporting national workforce planning	MoH, NPHI, IANPHI	i) Enhance the role of NPHIs in workforce planning to strengthen NPHI capacity. ii) NPHI, working in conjunction with their respective MoH, to input into national health workforce planning that addresses the wider public health system workforce issues beyond the NPHI. iii) Technical and financial support for low-income countries and small NPHIs through peer to peer or bilateral relationships to establish or refresh workforce plans.	MoH, NPHI	NPHI input into national health emergency workforce planning with a focus on wider and long-term system resilience. National workforce plans devised or refreshed.	Strengthened NPHI and health emergency workforce capacity.
7. Develop, test and fund comprehensive surge plans	Clear, tested, context-specific surge protocols implemented	NPHI, MoH	i) Create and operationalize surge protocols. ii) Exercise those surge protocols. iii) Regional and peer to peer support and exchange of knowledge and experience. iv) Fund the development and testing of surge plans. v) Secure funding for surge deployments.	NPHI	Comprehensive surge plans devised and exercised.	Health systems able to rapidly and effectively surge their workforce to respond to a public health emergency
8. Build a diverse, flexible workforce resource for public health emergencies	To have an expanded pool of human resources that can be drawn on for emergencies.	MoH, NPHI	i) Establish a volunteer roster ii) Collate a database of retired staff who can be called upon iii) Develop partnerships with academic and NGOs who can provide additional surge capacity iv) Deliver deployment training vi) Develop support mechanisms for deployed staff	MoH, NPHI	Roster/database of deployable staff that can be activated in an emergency. Developed standardized pre-deployment training in health, safety, and cultural readiness. Strengthened support systems for deployed staff.	In the event of a national public health emergency, sufficient skilled staff can be sourced and mobilised as part of surge response.

Areas for Action	Aim	Stakeholders	Activity	Lead/ Responsibility	Expected Output	Expected Outcome
9. Explore the role of technology to support health emergency response	Health emergency response is optimised through the use of technology.	NPHI, MoH	i) Explore the possible utility of artificial intelligence and automation to enhance early warning systems. ii) Optimise public health intelligence dashboards. iii) Strengthen and improve intelligence systems (e.g. through greater integration of surveillance data) iv) Strengthen and improve communication channels to aid timely response and transparency.	NPHI	Early warning systems are optimised to provide timely alert and warning of potential threats. Situational awareness for decision makers is improved.	Health system response to public health threats is timely and optimised through better situational awareness and early warning.

C. Mechanisms and systems

Areas for Action	Aim	Stakeholders	Activity	Lead/ Responsibility	Expected Output	Expected Outcome
10. Enhance coordination mechanisms	To improve the coordination of surge responses to public health emergencies and threats.	NPHI, MoH, WHO, IANPHI, regional networks (GOARN, EMT) with country presence	i) Map existing surge mechanisms and identify gaps. ii) Develop and improve deployment and surge coordination mechanisms. iii) Promote the use of existing multi-lateral deployment platforms iv) Adapt mechanisms to reflect local contexts, capacities and hazards. v) Institute cross-border emergency preparedness exercises vi) Integrate system strengthening efforts into health emergency management systems	NPHI, WHO	Streamlined deployment of surge response and well-coordinated surge mechanisms. Context-specific mechanisms developed that support field responses and improve multi-hazard response capacity. Greater cross-border collaborations.	Well-coordinated multi-agency and multi-sectoral action, including for cross-border responses to public health threats.
11. Develop global engagement protocols	Strengthen global norms of joint working and response to public health threats.	WHO, IANPHI	i) Support NPHIs to develop deployment plans or SOPs that align public health priorities with regional / international networks' operating models and national goals. ii) Create engagement protocols and policy briefs to support efforts to gain governmental endorsement for deployments. iii) Carry out joint training, NPHI-NPHI twinning, peer reviews, and simulation exercises.	WHO	NPHI deployment plans align with national and international protocols. NPHI resources (engagement protocols and policy briefs) to advocate for deployments. Culture of joint NPHI-NPHI training and peer reviews becomes normative.	Global norms for joint working and response to public health threats

D. Leadership and global engagement

Areas for Action	Aim	Stakeholders	Activity	Lead/ Responsibility	Expected Output	Expected Outcome
12. Formalise the role of the NPHI for all public health emergencies	There is clear leadership and role for NPHIs in public health emergencies	MoH, NPHI, Governmental ministries	i) NPHI clearly designates a senior leader for emergencies to coordinate multi-sectoral efforts ii) Partnerships between key stakeholders are formalised iii) Build formalised leadership structures for public health emergency management iv) Train and develop leaders for emergencies from national to subnational levels. v) Implement and clarify formal lines of communication and information exchange between partners and levels of government.	MoH, NPHI	Clear senior NPHI leader for emergencies that is known across sectors. Trained cadres of leaders for public health emergencies. Formal structures for health emergency management. Formal partnership agreements on ways of working in emergencies between key actors. Clear communication lines between actors	Clear and strong leadership in public health emergencies. Clear role for NPHIs in public health emergencies.
13. Establish global norms for public health emergency response and collaboration	Establish global norms for public health emergency response and collaboration	MoH, NPHI, WHO, Regional CDCs, IANPHI	i) Develop and agree standardised criteria for when countries would contact international bodies. ii) Encourage proactive rather than reactive communication between key agencies. iii) Institute multi-agency After Action Reviews (AARs). iv) Audit the implementation of learning from AARs. v) Conduct activities that promote international NPHI collaboration e.g. joint cross-border simulation and training exercises. vi) Establish communities of shared practice.	WHO, Regional CDCs, IANPHI	Early engagement / alerting by countries in a public health emergency. AARs are routinely conducted after major incidents and public health emergencies. Communities of shared practice exist to exchange ideas, good practice, learning and intelligence. Regular international collaboration activities between NPHIs.	Wider national and international public health system activated early in an emergency
14. Expand support networks	Strengthen resource mobilisation for LICs in emergencies	WHO, Regional CDCs, IANPHI, donors	i) Establish mechanisms to enable LICs to access broader international support rapidly. ii) Encourage donor support for preparedness activities in under-resourced settings	WHO, Regional CDCs, donors	Clear mechanisms exist for LICs to seek timely international support. Avenues for donor support exist.	Resource gaps in health emergencies in LICs can be rapidly addressed.

Appendix 2: Methods

This survey had two components – a structured questionnaire survey sent to all IANPHI members, and key informant interviews with a targeted selection of NPHI leaders.

The survey

A web-based questionnaire was disseminated to 127 IANPHI members in 107 countries between October 2024 and March 2025. The survey was deployed using the survey tool, SelectSurvey v5.0. IANPHI requested a senior-level focal individual to act as liaison and coordinator to collate the information. All IANPHI member institutions were invited to participate, and email reminders were used to maximize the survey response rate. Data were securely collected and stored on a cloud-based server housed in the European Union to which only core survey team members had access. Data were descriptively analyzed, stratified by World Health Organization region, World Bank income group, and self-reported NPHI size.

A total of 59 questions were asked, including questions about the characteristics of the IANPHI member organisation responding to the questionnaire. Core survey questions included questions on the responding NPHI's mandate and governance, public health emergency workforce, surge capacity and rapid response, and connected leaderships in health emergencies.

The survey achieved a reasonable response rate for a large multi-country survey and was well represented across all WHO regions and World Bank income groups, however less than half of all survey respondents submitting a survey. As with all self-administered surveys, this study was limited by the perceptions and experience of respondents and their ability to interpret the questions, and response options available. Further, the survey was administered in four languages only, which might have an impact on interpretation and understanding of the questions as well as sampling bias. Despite targeting senior-level respondents, having only one focal person per NPHI responding to a topic area that covers regional and international topics may have limited responses beyond the national context.

Key informant interviews

Key informant interviews were also carried out through a qualitative sub-study conducted after the initial survey. The project team identified a targeted set of NPHIs to conduct more in-depth interviews with. The NPHIs were selected to ensure diversity in terms of country income levels, and WHO region. In addition, a regional network that was an associate member of IANPHI was also invited to capture a regional organisation's perspective. Invitation emails were sent to the respective directors of those NPHIs. Potential participants were informed in writing of the purpose of the interviews. The interviews were voluntary and undertaken on the condition of anonymity to encourage open dialogue.

Interviews were conducted virtually by videoconferencing online with the respective NPHI key informant. The interviews took place between January – March 2025. These were undertaken by 2 interviewers and observed by 2 note-takers who took notes as well as transcribed and summarised the interviews. These interviews lasted between 30-60 minutes and carried out in English. The interviews were guided by an interview topic guide developed specifically to explore the following key themes:

1. What would enable NPHIs to engage and respond to national and international public health emergencies?

2. How can IANPHI help NPHIs to enable them to engage with GHEC?

3. Focused discussion on connected leadership

Ethical waiver and research governance

This survey and interview protocol was submitted for review and approval by the IANPHI working group. IANPHI formally requested and received a waiver from ethical approval from Emory University's institutional ethics review board.

In addition, the IANPHI project team ensured, in line with IANPHI's internal policies and code of conduct, that the steps associated with the survey took measures to protect the participants from harm or danger, preserve their rights, and reassure them that this was being done.

Data management and protection

IANPHI complies with the General Data Protection Regulation (GDPR) that came into effect on 25 May 2018. All data was processed in a manner that ensures appropriate security, including protection against unauthorised or unlawful processing and against accidental loss, destruction, or damage. With regards to the security of data storage, with the online survey, there was inbuilt mechanisms to protect data. Data was stored on IANPHI's SharePoint folder which was password protected with an individual password known only by members of the survey team.


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