

Public Health Institutes of the World

A faint, light gray world map is centered in the background of the page, showing the outlines of continents and major landmasses.

LESSONS LEARNED FROM  
NATIONAL PUBLIC HEALTH INSTITUTES'  
RESPONSE TO THE COVID-19  
OUTBREAK IN 2020

MAY 2022

# CONTENT

INTRODUCTION	3
WHAT WE DID	4
WHAT WE FOUND	5
Responding to COVID-19 – the Essential Roles, Responsibilities and Positions of National Public Health Institutes	5
Diversity, Adaptation and Challenges: the Roles and Responsibilities of NPHIs during the First Months of the COVID-19 Pandemic	5
Case Study 1 - Public Health Wales: Working on the Margins of the NPHI’s Mandate	7
Multi-level and Multi-sectoral Collaboration as a Key Tool for an Effective Coordination of the Response	9
Case Study 2 - Colombia’s Instituto Nacional de Salud: Developing Strategic Partnerships to Grow Laboratory Capacity	10
Public Health System Resilience and the Way NPHIs Carried Out Essential Functions and Operations	11
Gaps in Public Health System Capacities and Inequalities at the Global Level	11
Case Study 3 - Nigeria Centre for Disease Control (CDC): Strategies to Access, Supply and Manage Medical Goods and Human Resources	13
A Workforce at its Limits	14
Crisis as an Opportunity: Perspectives on the Development, Strengthening and Preparedness of NPHIs for Future Health Crises	17
Opportunity for the NPHIs to Strengthen their Position of Trusted Scientific Advisers through New Skills and Improved Communication	17
Case Study 4 - U.S. Centers for Disease Control and Prevention: Lessons Learned about Data Modernization	19
Case Study 5 - Mexico’s Instituto Nacional de Salud Pública: Trusted Scientific Adviser through Leadership and Improved Communication	21
NPHIs’ Role Facing the Growing Importance of Addressing Health Inequalities to Respond to the Global Impacts of COVID-19	24
Case Study 6 - Public Health Wales: Understanding and Responding to the Socio-Economic Impacts of COVID-19 from a Public Health Point of View	26
CONCLUSION AND PERSPECTIVE FOR INTERNATIONAL COLLABORATION BETWEEN NATIONAL PUBLIC HEALTH INSTITUTES	28
Appendix: NPHI Lessons Learned from COVID-19 Interviews and Seminars	30

# INTRODUCTION

The International Association of National Public Health Institutes (IANPHI) collectively builds public health capacity and capabilities by connecting, developing and strengthening national public health institutes (NPHIs) worldwide. The Association currently has 110 member institutes in 95 countries.

Through their core functions and attributes<sup>1</sup>, NPHIs responded to the COVID-19 pandemic as soon as the virus started to spread across countries at the start of 2020. They provided scientific advice, epidemiological intelligence and technical assistance to the real-time monitoring and rapid decision-making aimed at the mitigation and control of the pandemic<sup>2</sup>. These functions covered a wide range of activities including the development and implementation of sampling, testing and diagnostic procedures, the organization of surveillance systems to produce daily and weekly reports for national monitoring and to aid decision-making, as well as contact tracing, disease screening and health promotion programs.

Quickly recognizing the critical role of NPHIs in responding to the COVID-19 pandemic and in protecting the health of the populations in their countries, in 2020 IANPHI launched an initiative to capture and highlight the lessons that members were learning. The objectives of this initiative – known as the IANPHI Lessons Learned Exercise on NPHIs Responses to the COVID-19 Outbreak – were to share the experience of IANPHI’s member institutes and identify the key lessons learned in this experience. The exercise assessed both the functions and activities that NPHIs carried out or developed in response to the pandemic and the interactions between NPHIs and national and international stakeholders.

This report is a synthesis of the IANPHI Lessons Learned Exercise on NPHIs’ Response to the COVID-19 Outbreak, based on the experience of member institutes during the first year of the pandemic (January to December 2020). The analysis demonstrates how the NPHIs, through adaptation of their functions and responsibilities, played an essential role in responding to the pandemic. It also highlights some of the challenges that NPHIs faced during the first year, as well as the good practices and many successes that were identified.

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1 International Association of National Public Health Institutes (IANPHI), National Public Health Institutes Core Functions and Attributes, 2009. <http://www.ianphi.org/includes/documents/sections/tools-resources/nphi-core-functions-and-attributes.pdf>

2 International Association of National Public Health Institutes (IANPHI), Rio de Janeiro Statement on the Role of National Public Health Institutes in Facing Health Inequities, 2022. <https://www.ianphi.org/includes/documents/sections/tools-resources/rio-declaration-health-equity.pdf>

# WHAT WE DID

The content of the report is based on the feedback collected from IANPHI members through a series of interviews and seminars conducted between September and December 2020<sup>1</sup>. These meetings were organized to record experiences at three levels:

- National level: One-to-one discussions between the IANPHI Secretariat and a member institute
- Regional level: Discussions at the regional level, organized by the four IANPHI Regional Networks (Africa, Asia, Europe and Latin America)
- Global level: Discussion between all IANPHI members, gathered in one session of the IANPHI Annual Meeting in December 2020

IANPHI members were guided through the Lessons Learned Exercise by a list of questions organized in five categories:

1. The institutional position of the NPHI in a national emergency; formal missions and roles of NPHIs within the national public health system
2. Roles and responsibilities of the NPHI during the COVID-19 pandemic (whether these were previously recognized or not)
3. The response and adaptation of NPHIs in the circumstances of the “best available” knowledge and resources, and any expansion of capacity during the crisis
4. The independence and transparency of NPHI’s scientific advice and publications, and the management of public and media relations
5. International cooperation between NPHIs; good practices and collective advocacy

The analysis of the information received from individual members highlighted three overarching themes and forms the basis for the structure of this report, which is illustrated with examples of experiences shared by NPHIs during the interviews, seminars or directly with the IANPHI Secretariat. These themes are:

- Responding to COVID-19 – the essential roles, responsibilities and positions of NPHIs
- Public health system resilience and the way NPHIs carried out essential functions and operations
- The opportunities arising from the crisis and the implications for NPHIs

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<sup>1</sup> More details on the interviews and seminars are available in the appendix.

# WHAT WE FOUND

## RESPONDING TO COVID-19 – THE ESSENTIAL ROLES, RESPONSIBILITIES AND POSITIONS OF NATIONAL PUBLIC HEALTH INSTITUTES

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The findings have shone a spotlight on the essential roles, responsibilities and positions of national public health institutes around the world. The pandemic required NPHIs, with diverse roles and responsibilities, to adapt to the challenges they faced in response to the pandemic. Multi-level and multi-sectoral collaboration was observed to be a key tool for the effective coordination to the response.

### Diversity, Adaptation and Challenges: the Roles and Responsibilities of NPHIs during the First Months of the COVID-19 Pandemic

National public health institutes cover a wide range of functions extending from monitoring and evaluating the health status of populations, to preparing for and responding to health risks including health prevention and protection. At the start of the pandemic, their roles and functions varied widely, depending on their mandate, size, resources and the existence of other bodies providing other public health services in the country. A challenge shared by many NPHIs at the beginning of the pandemic was to see their mandates and functions challenged beyond the scale of past experiences and available resources. As COVID-19 became rapidly the primary focus of all NPHIs, all their work programs had to be adapted, re-organized, re-negotiated or even suspended to concentrate resources towards the response to COVID-19. The experience of many NPHIs illustrated how their health systems were not adequately prepared for a major public health crisis such as the COVID-19 pandemic.

In general terms, NPHIs have provided critical advice to governments at technical and political levels. Institutes have produced and interpreted data and evidence available nationally and internationally. In some countries, governments have positioned NPHIs at the forefront to provide data and rationale to public bodies and to the public.

Specifically, their activities have included epidemiological surveillance at national and regional levels, support to or implementation of contact-tracing systems, technical data collection, analysis and interpretation, and even managing strategic stocks of medical supplies and equipment. Some NPHIs were focused on providing laboratory and clinical infectious disease services, including the co-ordination of national reference laboratories, quality control of tests and test kits, and genome sequencing. Others contributed actively to research and knowledge-sharing, the development and implementation of health promotion and behavioral interventions, delivering communication strategies, and a wide range of expert advice in response to requests from governments and society.

Reflecting on their experience during the first year, most NPHIs did not think they were ready for the challenges caused by COVID-19. However, due to the experience gained from previous outbreaks, some NPHIs felt better prepared, for example, those institutes with recent experience of responding to Ebola.

Many NPHIs had to make adjustments to their functionality very quickly because their scope and formal missions were not tailored to meet the challenges and multiple dimensions of the pandemic (see case study 1: Public Health Wales: Working on the Margins of the NPHI's Mandate). Poor communication and coordination between the different actors involved in the response, including the government, created additional difficulties for NPHIs. A common experience was the frequent requests from governments, often at very short notice, for advice from NPHIs. These requests were sometimes uncoordinated with different parts of the government asking for the same or similar information, and sometimes occurred without structured high-level dialogues between the institute and the government. This has placed many NPHI staff under considerable pressure to respond to multiple requests for information over a prolonged period of time, with many institutes reporting significant concerns about staff fatigue (physical and psychological).

Many NPHIs have been at the forefront of public criticism from government, media and social groups. Responding to the public health imperative but sometimes in the absence of clear mandates or institutional roles, NPHIs have been criticized for the decisions and actions they have taken. NPHIs have also had to accept differences between the advice they have provided to decision-makers and the reality of the measures taken or implemented. The experience of NPHIs demonstrates the importance of careful recording of the reasons for their decisions and actions, the scientific basis of their advice, and the accountability between the institute and the government.

These experiences underline the need for much greater clarity on the role of the NPHI in support of the government, other national decision makers, and other national and local public health organizations in a public health emergency. This includes greater clarity on channels of communication between all the actors involved. Above all else, the experience of NPHIs reveals the need for effective leadership at the national level, to ensure that the roles of actors are understood and discharged effectively, leading to better coordination and planning, and ultimately to a more effective response.

NPHI advice has arguably been more impactful where NPHIs have built strong relationships with government and effective cross-sectoral alliances. The level of communication and trust between NPHIs and governments appears to be linked with the quality and duration of collaboration prior to COVID-19.

Despite these challenges there were opportunities created by the redefinition of the scope and functions of NPHIs during the pandemic. These included changes in the way the NPHI worked, internally and with strategic partners, that were necessary not only for the response but offered insights that could endure beyond the pandemic. Some institutes reported that the increased demands on them allowed them to accelerate investments in services that had been chronically underfinanced, including laboratories, genomics, surveillance, contact tracing and health protection. For example, Mozambique's Instituto Nacional de Saúde reported that before the pandemic, they had difficulties establishing a national network of public health laboratories. The necessity arising from the response to COVID-19 allowed them to accelerate the development of this network.

## CASE STUDY 1

### Public Health Wales: Working on the Margins of the NPHI's Mandate

In the first few weeks of the pandemic, before the first case was detected in Wales, Public Health Wales (PHW) worked with local health boards to establish local sampling and testing arrangements. Health boards were requested to set up Coronavirus Testing Units (CTUs), usually co-located with existing health facilities. However, whilst these were being set up, PHW had to provide immediate sampling and testing capability in response to suspected cases. This involved deploying an Infectious Disease specialist to the patient's home or an agreed local health setting to assess the individual and take samples. Following the first case in Wales at the end of February 2020 and with increasing case numbers in early March, this quickly became unsustainable.

Health boards were providing local sampling services through CTUs by the beginning of March 2020 with samples couriered to the PHW laboratory in Cardiff for testing. By mid-March it became clear that mass sampling centers would also be required. PHW, working closely in support of the Welsh Government, entered into discussions with the Department of Health in England. In the early stages of these discussions very little information was shared with PHW and the Welsh Government, although it quickly became clear that plans were developing for drive-through sampling, online booking and the return of test samples back to laboratories elsewhere in the United Kingdom.

This presented several issues for Wales including the intention to use different swabs from those used in Wales and a technical inability to link the results from laboratories in England to the Welsh laboratory information system. Whilst discussions within Wales and between Wales and England continued in an attempt to resolve these issues, PHW started to scope the requirements for high volume sampling facilities in Wales. The Welsh Government and local health boards were involved in the identification of suitable sites.

At the end of March 2020, PHW was contacted by a private contractor, commissioned by the Department of Health in England, regarding a sampling center that they had set up at a football stadium in Cardiff. PHW had not received any prior communication about this. As the intention was to open the site the next day, staffed by PHW, this presented PHW with very significant challenges – PHW had made no plans for staffing a facility (it was anticipated that health boards would operate mass sampling centers), the proposed arrangements did not meet the operational governance requirements of the NHS in Wales and the issue of the use of different swabs had still not been resolved.

The local health board advised that they would need up to six weeks operational lead-in time so PHW worked closely with the Welsh Government to get the facility up and running in less than three days. This included the rapid deployment of more than 60 staff from the PHW screening division to run the center in Cardiff. To simplify operational planning, the screening director, an experienced operational manager, applied similar arrangements to those used in our main screening centers to very good effect.

The result of the intervention by PHW to ensure the success of the facility meant that the organization ended up folding the development of mass sampling centers into its sampling and testing plan. Three more mass sampling centers opened in Wales in April 2020 and in addition PHW worked with the Welsh Government and the Ministry of Defense to operationalize mobile testing units. Transfer of mass population sampling to health boards was finally achieved in June.



## Multi-level and Multi-sectoral Collaboration as a Key Tool for an Effective Coordination of the Response

As well as challenges arising from necessary adjustments to their roles and responsibilities, NPHIs also faced difficulties in the coordination of the different levels of the response (national, sub-national, local), and in ensuring clear and effective relationships with the sub-national and local levels. For example, some institutes had difficulties coordinating with laboratory networks at local levels, which precluded effective information sharing between the national and sub-national levels. This was sometimes driven by differences in the local experience of the pandemic, sometimes by differences in the resources available locally and sometimes by local politics. Accounts of these challenges were often reported from countries with a federated structure and strong states or provinces. For example, the Nigeria Centre for Disease Control described difficulties in providing support for all states because of political differences in some states on issues such as concerns about the economy.

In response to these challenges, NPHIs emphasized the importance of working closely with local authorities and health systems, and the need to involve them in the decision-making process as well as the design and delivery of essential services including surveillance and response. More emphasis must be given to strengthening the alignment of NPHIs with local bodies, as strong links with local actors are critical to the success of activities such as contact tracing. Working closely with a wide range of partners and sectors is an important tool for a coordinated and comprehensive response.

Another key element of an effective and coordinated national response identified by NPHIs was the importance of working in a multi-sectoral way, allowing them to collect quality, timely data and advise decision-makers alongside and in coordination with other sectors.

Some NPHIs benefited from this multi-sectoral approach through their representation in high-level national advisory committees that supported governments and decision makers. Institutes represented in these committees provided critical support to national and local responses, alongside representatives from other sectors including universities, and organizations representing clinical and other scientific experts. For example, the Saudi Centre for Disease Control and Prevention was part of a ministerial committee created to advise the Ministry of Health, with representatives from 24 different entities in the country.

In other examples, multi-sectoral collaboration was also achieved through partnerships with non-traditional stakeholders including voluntary organizations, the private sector, and engagement with defense services. It has been an essential strategy for addressing not just the coordination of the response but also in building capacity and this second point is discussed in the next section of this report. Recognizing the importance of enhancing partnerships in the delivery of effective responses to public health challenges, both during a crisis and in time of peace, is an important area for organizational development and public health curricula (see case study 2: Colombia's Instituto Nacional de Salud: Developing Strategic Partnerships to Grow Laboratory Capacity).

## CASE STUDY 2

### Colombia's Instituto Nacional de Salud: Developing Strategic Partnerships to Grow Laboratory Capacity

There were six parts to the response to COVID-19 led by the Instituto Nacional de Salud in Colombia. First, using mathematical models to predict behaviors and to measure the effects of the policies implemented; second, an increase in laboratory diagnostic capacity; third, epidemiological surveillance; fourth, real-time public health research; fifth, social and labor protection; and finally, clinical services.

In terms of laboratory services, the most challenging issue for the institute was to grow biomolecular capacity, going from 200 PCR tests per day to nearly 64,000 tests. This was made possible thanks to strategic partnerships established with other sectors. In addition, from January 2020, a public-private network of modelers, linked to entities that usually do not work with the public sector, has enabled the management and use of up-to-date data and the development of accurate mathematic models. This led to the creation of thematic networks for diagnostics that will be maintained and mobilized in the event of a future crisis.

## Key Lessons Learned on the Essential Roles, Responsibilities and Positions of National Public Health Institutes

- A clear definition of the role and scope of functions of the NPHI itself, and with reference to other national bodies, is essential for managing crises.
- There is a need for a clear and mutually agreed understanding of the relationship between policy makers and NPHIs in responding to health emergencies.
- After the first few months of the pandemic, most NPHIs had achieved greater clarity on their roles and mandates in relation to other national actors, and even where difficulties persisted, the crisis helped define or redefine the roles and mandates of NPHIs and their position among national stakeholders.
- Long-standing relationships, practical connections and effective communication channels between NPHIs and government, built up over time, have been important in coordinating national responses to COVID-19.
- NPHIs must prioritize multi-sectoral, multi-level and collaborative approaches as part of their preparedness planning for a more comprehensive and robust response to health emergencies.
- Strengthening partnership skills, with a wide range of sectors, is a key strategic area to consider for developing the preparedness and response capacity of NPHIs to future public health threats.

# PUBLIC HEALTH SYSTEM RESILIENCE AND THE WAY NPHIs CARRIED OUT ESSENTIAL FUNCTIONS AND OPERATIONS

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The response to COVID-19 exposed significant gaps in the capacity of public health systems and highlighted some of the social and economic inequities that affected these. However, the findings from IANPHI members show how NPHIs managed to carry out the essential functions and operations required in the first year of the pandemic.

## Gaps in Public Health System Capacities and Inequalities at the Global Level

Alongside the challenge arising from the need for clarity on functions and mandates, a majority of NPHIs identified significant challenges in developing and accessing human, financial and material resources. Many considered themselves chronically under-funded before the pandemic and had limited capacity and capability to mobilize in response to the requirements arising from the pandemic. Nevertheless, they had to adapt their workforce and other response capacities and competencies very quickly. This created stresses within the organization in response to very challenging demands placed on NPHIs.

Difficulties accessing medical goods and supplies impacted some important functions, in particular laboratory and testing services. The global demand for test kits, personal protective equipment and therapeutic interventions in the first few months of the pandemic increased dramatically, and some NPHIs faced significant shortages of laboratory equipment with an early impact on their ability to fulfil mandates and provide effective responses to the pandemic. These global logistical difficulties seemed to have a disproportionate effect on low and lower-middle-income countries and those with limited manufacturing capacities, highlighting health and socio-economic disparities between regions and countries, and the unequal access to international markets and high quality essential medical goods and services (see case study 3: Nigeria Centre for Disease Control: Strategies to Access, Supply and Manage Medical Goods and Human Resources).

Some institutes also reported difficulties in handling the technical requirements to support specific systems, especially data management for epidemiological surveillance. For example, the National Institute of Communicable Diseases of South Africa found that the sheer quantity of data that had to be managed exceeded available bandwidth, placing significant demands on information technology teams that had to develop resilient solutions. Similar challenges were experienced in other countries,

at national and sub-national levels, and this was compounded by a lack of trained personnel for a range of very specific functions, including data science and bioinformatics.

In the face of adversity, NPHIs responded using a diverse range of approaches to leverage essential capacity. A critical first step for many NPHIs was to establish operational coordination with national and subnational agencies, both within the health system as well as with other public bodies. Some institutes also benefited from support through international cooperation, from regional and international organizations, including the United Nations, the European Centre for Disease Prevention and Control (ECDC), the Africa Centres for Disease Control and Prevention (Africa CDC) or the United States Centers for Disease Control and Prevention (U.S. CDC). This support took various forms, including help with the procurement of medical goods or ensuring training and capacity building. Some NPHIs also received support from institutes or governments in other countries such as the network of NPHIs in the Community of Portuguese Language Countries, where there is a long history of strong peer collaboration<sup>1</sup>. For example, Portugal's National Institute of Health Dr. Ricardo Jorge has provided support to African Portuguese-speaking countries, such as technical assistance and support for developing their approaches to the COVID-19 response.

To counter the global shortage of laboratory equipment, some NPHIs had to turn to alternative suppliers. Support from and partnership with the private and academic sectors, at the national and international level, allowed many NPHIs to expand and strengthen their capacities. For example, the Ethiopian Public Health Institute used laboratory equipment held in storage by local universities and private laboratories to conduct PCR testing.

Supported by these different strategies, as well as through re-organizing their response internally, NPHIs developed systems and programs to tackle the unprecedented challenges caused by COVID-19. This included laboratory systems and networks. For example, Peru's Instituto Nacional de Salud moved from one laboratory before the outbreak to 64 across the country in just a few months. This rapidly established network helped the institute adapt to testing needs and develop seroprevalence studies and SARS-COV-2 genomic analysis.

NPHIs had to contend with other gaps including published research on strategies for responding to a pandemic and the impacts arising from the interventions put in place. As knowledge production needs time and in the absence of definitive evidence, guidance produced by NPHIs could be challenged by governments, alternative providers and vested interests, and more widely by society. Many NPHIs established Covid-specific research activities or partnered with research institutions, in order to manage and produce the best available scientific evidence and guidance. Areas of knowledge development and dissemination included disease modeling, genomic epidemiological studies, health impact assessments, comparative analysis of international responses, and social and behavioral science.

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<sup>1</sup> Países Lusófonos Capazes de Testar Covid-19 com Apoio do INSA, Diário Económico, 24 April 2020. <https://www.diarioeconomico.co.mz/2020/04/29/mundo/paises-lusofonos-capazes-de-testar-covid-19-com-apoio-do-insa/>

### CASE STUDY 3

#### Nigeria Centre for Disease Control: Strategies to Access, Supply and Manage Medical Goods and Human Resources

At an early stage of the pandemic, the Nigeria Centre for Disease Control (NCDC) had to face several challenges in terms of access to medical goods and human resources. The main challenges included:

1. Storage: Lack of adequate warehouse for dry and cold chain product
2. Staffing: Weak warehouse staff capacity
3. Logistics: Weak adherence to new logistic management information system (LoMIS)
4. Security: Security challenges across the state, security-compromised areas
5. Policy: Low awareness of medical countermeasure logistic plan among the key stockholders and lack of education of policy makers

To face these challenges, Nigeria CDC first focused on national coordination and planning, to ensure an effective logistics chain through their three missions: procurement, allocation and distribution of medical goods and supplies. At an early stage of the pandemic, a committee was established between the NCDC and partners and stakeholders to quantify the needs in supplies, staff and budget, and identify the best possible resources at the global, regional and national level for procuring these goods and supplies. The institute also benefited from the good relationship with the government at the highest level, who supported the institute in terms of management and procurement, for example through the COVID-19 Presidential Task Force.

Getting support for procurement from international cooperation and support was an important element that helped accessing the needed material. In particular, the UN community facilitated the procurements, while Africa CDC and the private sector supported with supplies directly.

In terms of allocation of goods at the subnational level, Nigeria CDC defined priority areas to receive supplies, based on different criteria. Before there were any confirmed cases, the institute assessed the states most at risk, such as the ones where there were the most international travels, and allocated them starter packs in case of outbreak. Then, when the virus started to spread in Nigeria, the allocation was based on the number of confirmed cases, on the populations at risk and on specific requests from pillar leads, ministries' departments and agencies and national youth service corps (NYSC).

## A Workforce at its Limits

The need to expand the workforce capacity quickly and the requirement to maintain this over a prolonged period of time proved a common challenge. Rapid recruitment, redeployment and even remobilization of retired staff was a common feature of the response across the world.

In most NPHIs, pre-existing systems used for contact tracing could not be scaled-up to the extent necessary for responding to COVID-19. Many of these systems were overwhelmed during the pandemic, with the result that local outbreaks may not have been controlled adequately. To overcome this several institutes set up special units to coordinate contact-tracing systems at local levels. They had to develop or establish links with local networks and other organizations, including local authorities, to achieve the necessary scale and to ensure contact tracing conformed to best practices and that useful data could be collected at a national scale. This required rapid and intense training for contact tracing staff, organized and delivered by NPHIs. In some contexts, pre-existing networks of physicians were mobilized and coordinated by NPHIs to implement contact tracing strategies at local levels. Again, this highlights the need for effective coordination, adaptation and communication between different actors at different levels and in different sectors.

To address the lack of human resources, some NPHIs expanded workforce training, which was mainly delivered online, for new as well as existing staff (redirected from other areas of public health practice). Uganda's National Institute of Public Health, as with many other NPHIs, faced a lack of staff for contact tracing, and had to train staff rapidly from a wide range of backgrounds and experiences to carry out this essential public health activity at the scale demanded by the pandemic. Côte d'Ivoire's Institut National de Santé Publique, with the Ministry of Health, developed a training program, both for the general public and on specific issues. The program, which reached over 10,000 people, was conducted in partnership with several stakeholders including the Institut Pasteur and received support from WHO and UNICEF.

These gaps, and experiences, highlight the need for access to a workforce that can be rapidly scaled up in a pandemic, mobilizing specific expertise and skills. In a recent paper in *Nature*<sup>1</sup>, Christian Happi and John Nkengasong emphasize how, especially in the African context, strengthening NPHIs and regional health organizations is crucial to build capability on the prevention, detection and response to public health threats under the control of African agencies. This is particularly important in order to reduce the dependence on international support managed by central bodies outside of Africa, which are more focused on short-term crisis management rather than on building sustainable systems.

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<sup>1</sup> Christian T. Happi, John N. Nkengasong. Two years of COVID-19 in Africa: lessons for the world, *Nature*. 2022; n° 601: pp. 22-25. <https://www.nature.com/articles/d41586-021-03821-8>

The lack of human, material and financial resources needed to respond to the crisis created high levels of stress among staff, especially those seconded to different national response teams or newly recruited to increase human resource capacity. Training and integrating new people in a very short timescale proved to be a major challenge for NPHIs in the first months of the pandemic.

Many NPHIs described the effects of the COVID-19 response on their workforce. During the first year, the duration and scale of the response had a major impact on public health professionals including reports of physical and mental health problems and even 'burnout'. Many staff reconsidered their career decisions to practice public health or were thinking of leaving public health practice altogether. Now, two years after the start of the pandemic, it can only be expected that these impacts have worsened.

These findings are consistent with reports published recently. A survey of public health providers conducted in Malaysia in May 2021 found that 45 % had experienced 'burnout'<sup>2</sup> (defined as a multi-professional syndrome comprising emotional exhaustion and disengagement from work<sup>3</sup>). In a survey of U.S. public health staff conducted in August-September 2020, self-reported levels of 'burnout' exceeded 65 % and was more likely to be reported by those with more work experience. Equally concerning, the same survey found that nearly a quarter of the workforce (23.6 %) planned to continue in public health practice for three or more years<sup>4</sup>. In a separate report, the same authors recorded the extent to which staff has been redirected to the COVID-19 response across 31 U.S. states and the District of Columbia. This has had a significant impact on the provision of other essential public health services with reported reductions in chronic disease programs and maternal and child health services including child immunization<sup>5</sup>.

Worldwide, the experience reported suggests an urgent need for all NPHIs to review their workforce strategies and plans, make the case for additional investment in staff within NPHIs where necessary, or make the case for alternative strategies for ensuring that countries can mobilize the human resources necessary to respond to future public health emergencies. Several countries provided models for this including Germany and South Korea.

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2 Ibrahim F, Samsudin EZ, Chen XW, Toha HR. The Prevalence and Work-Related Factors of Burnout Among Public Health Workforce During the COVID-19 Pandemic, *Journal of Occupational and Environmental Medicine*. 2022; 64(1): 20-27.

3 Demerouti E, Bakker AB, Nachreiner F, Schaufeli WB. The job demands resources model of burnout. *Appl Psychol*. 2001; 86:499–512.

4 Stone KW, Kintziger KW, Jagger MA, Horney JA. Public health workforce burnout in the COVID-19 response in the U.S. *Int. J. Environ. Res. Public Health*. 2021, 18, 4369. <https://doi.org/10.3390/ijerph18084369>

5 Kintziger KW, Stone KW, Jagger MA, Horney JA (2021) The impact of the COVID-19 response on the provision of other public health services in the U.S.: A cross sectional study. *PLoS ONE* 16(10): e0255844. <https://doi.org/10.1371/journal.pone.0255844>

## Key Lessons Learned on Public Health System Resilience and the Way NPHIs Carried Out Essential Functions and Operations

- The COVID-19 pandemic highlighted how public health systems were not adequately prepared for a major public health crisis in terms of planning, organization and allocated resources.
- NPHIs need both to expand their scope and functions and to strengthen their capacities to be better prepared to handle future public health emergencies.
- The response to the COVID-19 pandemic allowed NPHIs to develop, or expand, essential public health services and competencies including laboratory services, contact tracing, and training that will be essential to respond to future health crises. Some NPHIs played an important role in generating and disseminating new knowledge through research and innovation.
- However, this came at a price with reports of high levels of staff stress and significant interruptions to other public health services.
- There is an opportunity for NPHIs to emerge stronger from the pandemic, in terms of organization, capacity, professional development and preparedness, but this will require open reflection on the lessons learned and compelling arguments made for any further resources, and this may become more difficult as memory of the pandemic recedes.



# CRISIS AS AN OPPORTUNITY: PERSPECTIVES ON THE DEVELOPMENT, STRENGTHENING AND PREPAREDNESS OF NPHIs FOR FUTURE HEALTH CRISES

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The previous section demonstrated how NPHIs capitalized on their pre-existing competencies, experiences, plans and approaches, and developed and adapted their strategies and activities in several critical areas of the response to COVID-19. This allowed them to deliver their core public health functions in a more effective way and to play an essential role in responding to the pandemic.

This section builds on the previous theme to show how the crisis caused by the COVID-19 pandemic also represented an opportunity for NPHIs. First and foremost, as discussed already, to review their strengths and weaknesses and prepare for future health threats. Second, to reassess and strengthen their position as trusted scientific advisers, acknowledging the need to enhance their competencies in this area and improve public and professional communication. Finally, NPHIs will have to confront the global impacts of COVID-19 and provide answers to the challenges exposed by health inequalities, the adverse effects on mortality trends observable in many countries, even if this pre-dated the pandemic, and the increasing legacy of preventable disease. IANPHI has recently published a statement on facing health inequities and several NPHIs have already contributed to the policy debate on this issue<sup>1</sup>. International collaboration is an opportunity to build capacity and advocate for stronger NPHIs.

## Opportunity for the NPHIs to Strengthen their Position of Trusted Scientific Advisers through New Skills and Improved Communication

The response to the COVID-19 pandemic has been a challenge on many levels for NPHIs, revealing the deficiencies and needs of public health systems worldwide. By highlighting these gaps, and at a time where public health is recognized as essential to the wellbeing of a society, the COVID-19 crisis represents an opportunity to strengthen NPHIs. This is not just about developing their capacities and increasing resources, but also through acquiring new competencies and improving their capability in public and professional communication. NPHIs will need to reaffirm their role of trusted scientific advisers and advocates for the government, stakeholders and the general public.

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<sup>1</sup> International Association of National Public Health Institutes (IANPHI), Rio de Janeiro Statement on the Role of National Public Health Institutes in Facing Health Inequities, 2022. <https://www.ianphi.org/includes/documents/sections/tools-resources/rio-declaration-health-equity.pdf>

Many NPHIs found themselves with insufficient expertise in key areas of the response to the pandemic including field epidemiologists, microbiologists and doctors in infectious diseases, laboratory scientists, data scientists, and bioinformaticians. These traditional and emerging public health professional roles will all need to grow in order to prepare for future health threats and crises.

However, many new areas of expertise will be required. Several NPHIs, including the Netherlands' National Institute for Public Health and the Environment (RIVM), demonstrated the importance of behavioral science to support the design and delivery of interventions and messages aimed at the population. The application of behavioral science links closely to social marketing and the need for improved skills in communication.

The demands arising out of the pandemic provide several opportunities for developing new approaches. First, there has been a recognition worldwide of the need to strengthen disease surveillance systems. In a commentary published in the *Lancet* in 2021, Morgan and colleagues<sup>2</sup> recognized that the COVID-19 pandemic has exposed weaknesses in diseases surveillance in nearly all countries. To ensure countries are able to detect and respond rapidly to outbreaks in the future, they set out five principles on which disease surveillance, integrated into national systems, should be based in the future.

- First, a strong surveillance foundation should monitor the population in a systematic, consistent, and statistically sound way.
- Second, surveillance systems must incorporate laboratory confirmation appropriately scaled for different diseases and risks.
- Third, surveillance systems must be digitized, with unique health identifiers to connect individual-level data and with privacy safeguards.
- Fourth, surveillance programs must use standardized case definitions and common data elements, with appropriate access for the public, local and national health authorities, regional bodies, and WHO.
- Fifth, disease surveillance must be adequately financed.

In September 2021, WHO launched a new hub, based in Berlin, and a new strategy, "Better Data, Better Analytics, Better Decisions", in order to develop a system of collaborative intelligence enabling better decisions to avert and manage pandemic and epidemic risks. The new hub is supported by a close collaboration with the Robert Koch Institute (RKI), the NPHI for Germany.

IANPHI has recently been awarded a grant by the Bill & Melinda Gates Foundation to work with the new hub and RKI to understand the realities, opportunities and challenges of implementing country-level integrated disease surveillance in NPHIs. Meanwhile, many NPHIs have already commenced active data modernization programs including U.S. CDC (see case study 4: U.S. Centers for Disease Control and Prevention: Lessons Learned about Data Modernization).

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<sup>2</sup> Morgan O, et al Disease surveillance for the COVID-19 era: time for bold changes, *Lancet*, May 2021. [https://doi.org/10.1016/S0140-6736\(21\)01096-5](https://doi.org/10.1016/S0140-6736(21)01096-5)

## CASE STUDY 4

### U.S. Centers for Disease Control and Prevention: Lessons Learned about Data Modernization

U.S. CDC's Data Modernization Initiative (DMI) is at the heart of a national effort to create modern, integrated, and real-time public health data and surveillance that can help protect us from any health threat, including pandemics like COVID-19, and underpins U.S. CDC's COVID-19 surveillance strategy. Launched in 2020, DMI is a multi-year, billion-plus dollar effort to modernise core data and surveillance infrastructure across the federal and state public health landscape. DMI is not just about technology, but about putting the right people, processes, and policies in place to deliver real-time, high-quality information on both infectious and non-infectious threats. The DMI Strategic Implementation Plan lays out U.S. CDC's key priorities and objectives for reaching the future state of public health data and key steps the agency is taking, including during the COVID-19 pandemic, to achieve this vision.

U.S. CDC is navigating the unprecedented challenges of COVID-19 surveillance while at the same time improving the nation's posture for the next public health emergency. Responding to COVID-19 requires many data sources to reveal the true picture of what is happening and to drive public health action. No one data source gives U.S. CDC all the information that scientists and researchers need, which is why the agency supports a holistic set of surveillance systems and works across technical areas to ensure alignment and integration. CDC relies on many data sources, new and established, including data on cases, deaths, laboratory tests, emergency department visits, hospitalisations, hospital capacities, healthcare data, variants, vaccine administrations, surveys, cohort studies, serology studies, mobility data, and many more. Some of U.S. CDC's data are reported to the agency from states while others CDC gathers through field-based studies or directly from healthcare facilities. The operation of these systems, as well as how they integrate with others and how data is used, is continuously assessed and improved.

The COVID-19 pandemic has catalyzed important improvements to surveillance systems, including at the state and federal levels, as the response evolved. For example, on genomic surveillance, U.S. CDC has made significant strides to increase domestic capacity over the last two years. U.S. CDC's National SARS-CoV-2 Strain Surveillance is implemented in close coordination with state and local public health labs as well as the Association of Public Health Laboratories and collects specimens from across the U.S. to support variant characterisation efforts. This system is powered statistically to detect a variant that is circulating at less than 0.1 % with 99 % confidence.

Similarly, before the COVID-19 pandemic, just 187 healthcare facilities were using Electronic Case Reporting. As of January 2022, more than 10,600 healthcare facilities in 49 states can send COVID-19 Electronic Case Reports. This has resulted in earlier disease detection and intervention as well as richer, more useful data to drive decisions. U.S. CDC is now working to institutionalize and build upon these improvements, helping ensure that they are integrated into the national surveillance system over the long term.

Second, the pandemic has challenged the role of the expert and there is now a need for NPHIs to regain and re-establish their role as trusted sources of scientific knowledge. NPHIs have had to contend with the disparate opinions and analyses from a wide range of other experts and other institutions that questioned the scientific evidence they provided, and sometimes challenged the credibility of the institute, potentially undermining public and official confidence. A particular concern arising out of the pandemic is the need to combat misinformation. This has been both a quantity and a quality problem; the quantity of information published during the pandemic has been enormous and the quality of the information has varied widely. Together with the increased ease of access to this information through a wide range of digital channels, the result has often been described as an “infodemic”. This phenomenon can lead to public confusion and encourage the dissemination of ‘fake news’. Both may affect the population’s trust in scientific information about COVID-19.

Experience from the pandemic has demonstrated the need for the measures decided by governments to be accompanied by an evidence-informed and transparent reasoning. However, this has not prevented wide differences in public perception and trust in the actions taken by governments. NPHIs have played an important role, as trusted scientific advisers, in providing the public with the transparent data and evidence that has supported decision making (see case study 5: Instituto Nacional de Salud Pública (Mexico): Trusted Scientific Adviser through Leadership and Improved Communication).

## CASE STUDY 5

### Mexico's Instituto Nacional de Salud Pública: Trusted Scientific Adviser through Leadership and Improved Communication

As in many other countries, the COVID-19 pandemic triggered a vast polarization between the people who systematically condemned and those who unconditionally supported the Mexican Government's actions. These two sides had strong political biases and few well-founded arguments. This had hindered objective discussions on the best available actions for responding to the pandemic and its devastating consequences.

In this situation and under the worst health crisis that Mexico has experienced since the last century, Mexico's Instituto Nacional de Salud Pública (INSP) convened a group of 13 academic institutions, research centers and international organizations with expertise in public health and equity, to participate in an exercise aimed at analyzing Mexico's experience during the pandemic and developing a series of evidence-based recommendations to improve the Government's response (including INSP this group was referred to as the Group of 14 Institutions or simply G-14). The analysis was conducted throughout October and November 2020, approximately eight months after the onset of the pandemic, and involved the participation in a series of seminars of almost 40 specialists in health, welfare, and social development from 29 institutions.

This initiative was based on the certainty, shared by the G14, that in order to be useful, the analysis had to exclude political biases or interests unrelated to the health and welfare of the population. It began with an analysis of the structural conditions of the health and social protection systems before the pandemic, which influenced the capacity of the response and the effectiveness of the actions implemented. The second step was an analysis of the specific actions that were adopted in response to the pandemic and concluded with a series of recommendations and a dialogue between the health authorities in charge of the management of the pandemic and other key stakeholders.

The section analyzing the pre-pandemic structural factors limiting the response capacity examined the health system's coverage, infrastructure and human resources, primary care, surveillance systems, diagnostic capacity, financial protection, quality of care, prevalence of chronic diseases that increased the severity of COVID-19, the mortality statistics system, the structure of income, employment, welfare and inequality in the country, and the health education of the population.

The section describing the actions adopted in response to the pandemic included initial measures for the control of the spread of the disease; mitigation actions; the application and removal of restrictions including 'lockdowns'; the use of PCR tests; the strengthening of hospital capacity; mortality monitoring; risk communication; health education interventions; and employment, income, and welfare protection policies.

The recommendations from the 40 specialists covered five issues:

1. How to reduce the transmission of infection during the phase of the return to economic activities?
2. What actions should be implemented in private and public sector organizations?
3. How to reduce the high lethality of the infection in the country and how to ensure a high quality of care for COVID19 patients?
4. How to mitigate the effects of the pandemic and the restrictions applied including 'lockdowns' on the economy, employment, income, welfare, and equity?
5. How to mitigate the effects of the pandemic on older adults and on mental health?

The recommendations were presented and the report<sup>1</sup> delivered to the health authorities, leading to a fruitful dialogue that resulted in several additional initiatives by the G-14 to support the government during the pandemic, including a second report on preparation and response to future pandemics<sup>2</sup>.

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1 Reflexiones sobre la respuesta de México ante la pandemia de Covid-19 y sugerencias para enfrentar los próximos retos. Instituto Nacional de Salud Pública. <https://www.insp.mx/recomendaciones-pandemia/publicaciones-61a19315bde452.11106751>

2 Propuestas para el desarrollo de un plan de preparación y respuesta ante una emergencia sanitaria por riesgo de pandemia. Instituto Nacional de Salud Pública. <https://www.insp.mx/recomendaciones-pandemia/propuestas-para-el-desarrollo-de-un-plan-de-preparacion-y-respuesta-ante-una-emergencia-sanitaria>

Third, all NPHIs have seen a significant increase in the demand for direct communications with the general public. People have sought information directly from NPHIs across many areas of the COVID-19 response, including authoritative information on the virus and its spread in their communities (provided via surveillance data dashboards), and guidelines on looking after themselves, and what to do in the context of restrictions and reduced non-urgent health care services. Some NPHIs have also been contributors to and sources of new knowledge (research). In many countries NPHIs have played a leading role in providing updates to the population, standing alongside senior politicians.

The requirement for health promotion communications to the general public was reinforced and scaled up quickly at a national level by a number of member institutes. Health promotion messages have been developed in close collaboration with other departments within NPHIs and between NPHIs and other public health bodies at a national level. Most NPHIs have had an active role in regularly surveying the health status of their population and had to constantly adapt their public communications in response to emerging findings.

Fourth, in many countries, the public's perception of the NPHI and its performance was a reflection of the overall communications of the government. Some NPHIs faced challenges getting approval for their communication strategies when there were differences of view with the government. Sometimes there were differences across different parts of the government, which NPHIs had to navigate. The result was that levels of trusts and acceptance by the public were affected. These observations highlight the need for clear channels of communication and effective coordination between NPHIs and their governments, ideally each working to mutually aligned and reinforcing communication strategies.

There is an opportunity to rethink the whole approach to public communications in a public health emergency, acknowledging that governments decide and NPHIs act. This includes regular updates on epidemiological and testing data, case definitions and stocks of medical equipment. Transparency is increasingly understood to be an important factor for increasing public acceptance of the measures introduced in response to COVID-19. Some NPHIs established trust with their population by communicating uncertainty and explaining the reasons why, as knowledge increases, scientific positions can change.

Finally, the critical importance of effective risk communication to the population, and securing public support for the actions proposed in response to the pandemic, required close engagement between all NPHIs and the media. Managing media relations has consumed a significant amount of time and effort on the part of NPHIs to ensure that the information that was disseminated through media channels was accurate and to explain the NPHI's and national response strategies. When these relations were good, the media served as a powerful tool for presenting information to the public and countering the dissemination of 'fake news'. However, many NPHIs were unprepared for the quantity and intensity of the approaches they received from the media and the public exposure that accompanied this heightened interest. Some NPHIs, especially those whose institutional accountability had not been clarified, found this attention threatening.

There is now an opportunity for NPHIs to develop new competencies and improve their communication management skills. This is critical if they are to deliver evidence-based advice and guidance that is trusted by the population. NPHIs also need to develop clear strategic plans at the national level for communicating their data, guidance and advice to their populations and to decision makers. To achieve this, NPHIs will need to strengthen their communication resources in order to build proactive capability.

## NPHIs' Role Facing the Growing Importance of Addressing Health Inequalities to Respond to the Global Impacts of COVID-19

Many NPHIs drew attention to the long-term impacts of COVID-19 and the need for NPHIs and other public health actors to focus much more on addressing the health inequalities exacerbated by the pandemic.

The COVID-19 pandemic has been called a syndemic<sup>1</sup>, or synergistic epidemic, a term first used in the 1990s by the medical anthropologist Merrill Singer<sup>2</sup> to refer to the wider biological and social issues that interact with an infectious disease. These include pre-existing medical and social conditions that increase the vulnerability of the population to an infection. This is exacerbated by the fact that these conditions often go hand in hand: chronic diseases like diabetes, obesity, heart disease and high blood pressure co-exist with social inequality and poverty. The argument goes that we cannot fully control the infection without addressing these factors.

Prior to the COVID-19 pandemic, dramatic differences in health, linked to socioeconomic inequities, already existed between and within countries. Global, regional and national evidence shows that COVID-19 and its containment measures have exacerbated underlying inequities, exposed new vulnerabilities and created a public health and socio-economic legacy that will endure long after we have learnt to control and live with the virus. It has revealed the fragility of systems and capacities linked to chronic under-resourcing of public health, disease prevention and health promotion. The impact on livelihoods, especially for the most vulnerable in our societies, has been catastrophic.

Some NPHIs have already started to measure and tackle health and social inequities by, for example, carrying out surveys, modeling impacts, undertaking assessments and publishing reports on the impacts of COVID-19 on employment, home working, social distancing and mental wellbeing. Some of these studies, developed through partnerships with academia and other organizations, concluded that the indirect harms of COVID-19 could have a more significant impact on society than the actual effect of the disease.

Santé publique France, for example, developed a program targeted to addressing COVID-19 in vulnerable populations in France in collaboration with researchers, public health services, local health authorities, social workers, non-governmental organizations and stakeholders. Based on a rapid review of the evidence and experience, it aimed at developing and supporting the implementation of evidence-based action that took into account the social context, specificities and diversity of vulnerable populations.

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1 Horton R. COVID-19 is not a pandemic. *Lancet* Vol 396 September 26, 2020. [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)32000-6/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)32000-6/fulltext)

2 Singer M, Bulled N, Ostrach B, Mendenhall E. Syndemics and the biosocial conception of health. *Lancet* 2017; 389: 941–50. <https://pubmed.ncbi.nlm.nih.gov/28271845/>



Other institutes implemented direct actions, developing partnerships with civil society and financially and technically supporting emergency actions for vulnerable populations through private donations. For example, Brazil's Oswaldo Cruz Foundation introduced direct social actions with civil society groups, including financial and technical support for their sustainability and expansion. A public call to support emergency actions for vulnerable populations took place, during which 850 projects from different regions were presented and 145 were approved, financed by private donations for around 800,000 USD. Food security, health communication, mental health, assistance to risk groups, and collective and individual hygiene were the areas of actions identified.

The threat to the population's long-term mental health is a particular cause for concern among NPHIs. In the context of socio-economic factors such as loss of employment or the effects of social isolation, the COVID-19 pandemic resulted in psychological trauma for many in the population, particularly impacting the most vulnerable and those in the poorest communities with the least social and financial resilience. NPHIs have measured increased rates of depression, sleep disorder and anxiety since the beginning of the pandemic and the first containment measures implemented. Some implemented surveillance tools devoted to behavior and mental health, such as in France through a monthly online population survey (COVIPREV<sup>3</sup>) that was initiated very early in the course of the pandemic (March 2020).

Programs to tackle health inequalities, chronic diseases and mental health problems will have to be implemented for NPHIs to respond to the wider impacts of the COVID-19 pandemic. This crisis goes further than the infectious disease, representing a significant threat to the general wellbeing of the population (see case study 6: Public Health Wales: Understanding and Responding to the Socio-Economic Impacts of COVID-19 from a Public Health Point of View). As protecting public health and wellbeing in their countries is a key role of NPHIs, they should be allocated sufficient resources and capacities to respond to health inequalities and advocate for more action on this issue.

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3 CoviPrev : une enquête pour suivre l'évolution des comportements et de la santé mentale pendant l'épidémie de COVID-19, 23 December 2021, Santé publique France. <https://www.santepubliquefrance.fr/etudes-et-enquetes/coviprev-une-enquete-pour-suivre-l-evolution-des-comportements-et-de-la-sante-mentale-pendant-l-epidemie-de-covid-19>

## CASE STUDY 6

### Public Health Wales: Understanding and Responding to the Socio-Economic Impacts of COVID-19 from a Public Health Point of View

In 2020, as part of its response to COVID-19, the WHO Collaborating Centre at Public Health Wales examined the socio-economic impacts of COVID-19 from a public health perspective and, in March 2021, published a report, “Placing Health Equity at the Heart of the COVID-19 Sustainable Response and Recovery: Building Prosperous Lives for All in Wales”. The report sets out to inform and support a sustainable response and recovery from COVID-19 in Wales. It reinforces the understanding of how interdependent individual and societal wellbeing, and the wider economy are. It does so by applying an innovative framework of ‘five essential conditions’<sup>1</sup> to map the wider social, economic and environmental impacts of COVID-19, providing a multifaceted picture of the implications on health equity and vulnerability in Wales. This includes analysis and synthesis of national and international evidence, data and intelligence, public perceptions and experience, health economics modeling, policy response and mitigation measures.

The report highlights the public health and socio-economic crisis triggered by the COVID-19 pandemic, which has exacerbated underlying inequities and exposed new vulnerabilities. It supports understanding of the wider, less visible impacts of COVID-19, such as poverty and deprivation, social exclusion, unemployment, education, the digital divide, harmful housing and working conditions, violence and crime. It also highlights the disproportionate impact of COVID-19 on specific groups such as children and young people, women, key workers and ethnic minorities. The case for investment in people’s wellbeing, health equity and prevention is stronger than ever and requires coherent action across all sectors towards closing the health gap.

The conclusion reached is that returning to the way things were before the pandemic is not enough. Preparing better for the next pandemic is not enough. Instead, the report describes the opportunities for going much, much further if we are to address the legacy of COVID-19.

There is an opportunity for a transformative, synergetic recovery, accelerating innovation, bridging the gaps in health, education, housing, income, employment prospects and social safety nets, advancing green solutions, and ensuring the wellbeing of current and future generations. There is an opportunity to prevent future epidemics and crises, building sustainable, inclusive, evidence-informed systems, policies and services that enable healthier

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<sup>1</sup> World Health Organization - Regional Office for Europe. Healthy, prosperous lives for all: the European Health Equity Status Report. 2019. <https://www.euro.who.int/en/health-topics/health-determinants/social-determinants/health-equity-status-report-initiative/health-equity-status-report-2019>

living environments and behaviors, and strengthen individual and community resilience to infections and adversities. To prevent perpetuating the socio-economic crisis and related vulnerability, equity needs to be placed at the heart of the short and longer term COVID-19 response and recovery.

Joint action to mitigate the harms from COVID-19 has become a priority and the report from Public Health Wales proposes building an 'Economy of Wellbeing' Approach – a type of recovery that leverages health and wellbeing, social, economic and environmental co-benefits of policies and investments across sectors in rebuilding healthy prosperous lives for all, now and in the future. The intention is to do this by building on Wales' unique assets, for example, legislation including the Wellbeing of Future Generations (Wales) Act 2015<sup>2</sup>, and its commitment towards a healthier, more equal and prosperous Wales.

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2 Welsh Government. Well-being of Future Generations (Wales) Act 2015: guidance. 2016. <https://gov.wales/well-being-future-generations-wales-act-2015-guidance>

## **Key Lessons Learned on the Perspectives on the Development, Strengthening and Preparedness of NPHIs for Future Health Crises**

- There is a need to mobilize a wider range of experts and sectors in the response, such as data scientists and behavioral scientists.
- Despite transparent data provided by NPHIs, public perception of NPHIs can be affected by the clarity of overall government communications. Public trust and acceptance of COVID-19 response strategies depend in large part on the consistency of communications from all government bodies.
- Public health messages must be short, clear and adapted to different contexts and social groups. Communicating uncertainty contributes to gaining public trust.
- Chronic diseases, mental health and health inequalities must be included in the response to and recovery from the COVID-19 pandemic.
- Equity needs to be placed at the heart of the short and longer term COVID-19 response and recovery.

# CONCLUSION AND PERSPECTIVES FOR INTERNATIONAL COLLABORATION BETWEEN NATIONAL PUBLIC HEALTH INSTITUTES

Since the first cases of COVID-19 were reported, national public health institutes have played a major role in detecting and monitoring the spread of the SARS-CoV-2 virus and responding to the pandemic and its wider impacts on public health. They were on the front line of the response during the first year of the pandemic delivering essential public health functions, including epidemiological surveillance of cases; genomic sequencing to identify and track new variants; contact tracing; research; evaluation of interventions; providing evidence-based guidance to decision makers; and delivering prevention and health promotion programs. This role continued in 2021 as the response shifted to the implementation, monitoring and evaluation of the COVID-19 vaccine strategy.

To carry out these essential missions, NPHIs had to overcome multiple challenges including a lack of critical service capacities and resources, poorly defined roles, complex multi-level and multi-sectoral coordination, and rapidly evolving and wide-ranging requirements for professional and public communication.

The NPHI lessons learned exercise highlights the critical role of an adequate and well-trained public health workforce in the response to the pandemic. It also documents the major impact the pandemic has had on the physical and mental health of public health professionals. Some NPHIs have taken initiatives to reinforce their workforce and developed specific urgent training during the pandemic. There is a clear need for more investment in the next generation of public health professionals and to renew training based on the lessons learned and the emerging new competences needed. This report identifies several priority areas shared by NPHIs across the world. Public health institutions, including NPHIs, should also invest in a more resilient work environment to reduce as much as possible the occupational impact of events like the pandemic on their public health workforce.

The pandemic also presented many opportunities for NPHIs, at a moment in time when public health organizations were seen as more vital than ever. NPHIs are essential actors in achieving population health and wellbeing, and there is a need to clarify the mandates of many institutes, invest in services and staff, and for the institutes themselves to demonstrate their role as trusted scientific advisers to governments and the public.

Developing skills within NPHIs, including new competencies, will be essential to prepare for and respond to future health threats. These should not only enhance the capability of NPHIs to face health emergencies but also to address the long-term impacts arising from the crisis.

International collaboration, coupled with a practical understanding of national contexts, is very important to build capacity and to advocate for stronger NPHIs globally. IANPHI and its member NPHIs need to collaborate and benefit collectively from the experience and knowledge acquired at the regional, national and local levels.

During the first year of the pandemic, almost all the work of NPHIs was focused on responding to the emergency. This inevitably resulted in non-Covid public health programs being suspended or delayed. This highlights a need for NPHIs to develop plans for 'adapted preparedness', so they are not only better prepared to respond to major health crises but able to do so while maintaining other essential functions and activities. The need for this is highlighted by the wider impacts arising from the pandemic and the restrictions applied in many countries including effects on child and adult mental health, the impact arising from the suspension of non-urgent health care services including delayed or missed diagnosis of other diseases, effects on vulnerable groups, increased social isolation and effects on child education. Some NPHIs implemented programs to document and evaluate these impacts, for example, using health impact assessment methods. These have demonstrated a close link between the adverse impacts observed and pre-existing social inequities.

As health inequalities emerged as a major issue raised by NPHIs during the Lessons Learned Exercise, IANPHI decided to make this topic one of the key areas for its activities in 2021. This has been advanced in three ways:

- The IANPHI Strategy 2021-2025 includes the establishment of a thematic group to develop NPHI positions on key public health responses including social and regional health inequities.
- The main theme of the 2021 IANPHI Annual Meeting (December 1-3, 2021), hosted by the Oswaldo Cruz Foundation (Fiocruz, Brazil), was health inequities. This was examined in the context of current major public health challenges (COVID-19 and climate change) with a focus on the practical tools and solutions used by NPHIs.
- From the 2021 IANPHI Annual Meeting, IANPHI prepared and published a Statement on the Role of National Public Health Institutes in Facing Health Inequities, advocating for NPHIs to put the promotion of health equity at the core of their work.

# APPENDIX: NPHI LESSONS LEARNED FROM COVID-19 INTERVIEWS AND SEMINARS

The content of the IANPHI Report “Lessons Learned from NPHI response to the COVID-19 Outbreak in 2020” is based on the outcomes of the following series of virtual interviews and seminars.

## [Bilateral interviews led by the IANPHI Secretariat](#)

August 5, 2020: Public Health Wales

August 6, 2020: Public Health England

## [IANPHI Asian Network](#)

### **Discussion on the lessons learnt during COVID-19-IANPHI Asian Network**

November 2, 2020

Chaired by the Regional Chair, Haleema Alserehi (Saudi CDC)

Participants: Institute of Epidemiology Disease Control and Research (Bangladesh), Chinese Center for Disease Control and Prevention, National Institute of Health of Pakistan, Saudi Center for Disease Control and Prevention (Kingdom of Saudi Arabia)

## [IANPHI African Network](#)

### **Interviews led by the IANPHI U.S. Office and the IANPHI Secretariat, with support from the U.S. Centers for Disease Control and Prevention**

Interviews led in French:

November 13, 2020

Participants: Institut National de Santé Publique, Burkina Faso, Institut National de Santé Publique, Côte d’Ivoire

November 18, 2020

Participants: Rwanda Biomedical Centre; Institut National d’Hygiène, Togo

Interviews led in English:

November 6, 2020

Participants: Nigeria Center for Disease Control; University of Zimbabwe

November 10, 2020

Participants: Ethiopian Public Health Institute; National Institute for Communicable Diseases, South Africa; Uganda National Institute of Public Health

November 13, 2020

Participants: Instituto Nacional de Saúde, Mozambique; Nigeria Center for Disease Control; Uganda National Institute of Public Health

November 16, 2020

Participants: National Institute for Communicable Diseases (South Africa)

### [IANPHI European Network](#)

#### **Seminar: IANPHI-Europe lessons learned from European NPHI responses to COVID-19**

November 5, 2020

Held by the IANPHI Secretariat and chaired by the Regional Chair, Quentin Sandifer (Public Health Wales)

Presentations from: Tervise Arengu Instituut, Estonia; Santé publique France, Robert Koch Institute, Germany; Israel Center for Disease Control; Istituto Superiore di Sanità, Italy; Public Health Wales  
Followed by an open discussion with IANPHI European members and partner organizations

### [IANPHI Latin American Network](#)

#### **Meeting series: Lessons learned from Latin American NPHI responses to COVID-19**

Held and chaired by the regional chair, Felix Rosenberg (Fiocruz, Brazil)

September 14, 2020

Presentations from: Administración Nacional de Laboratorios e Institutos de Salud (ANLIS), Argentina; Instituto Nacional de Laboratorios de Salud, Bolivia; Oswaldo Cruz Foundation (Fiocruz), Brazil; Instituto Nacional de Salud, Colombia; Instituto Nacional de Investigación en Salud Pública, Ecuador; Laboratorio Central de Salud Pública, Paraguay (guest); Instituto Nacional de Salud, Peru

September 21, 2020

Presentations from: Caribbean Public Health Agency; Instituto Nacional de Salud, El Salvador; Instituto Nacional de Salud Pública, Mexico; Directorate-General for Health of Uruguay (guest)

### [Global seminar](#)

#### **Lessons learned from NPHI Responses to the COVID-19 Outbreak**

A virtual session of the IANPHI Annual Meeting 2020, hosted by the Oswaldo Cruz Foundation (Fiocruz, Brazil), the IANPHI Secretariat and the IANPHI U.S. Office, and chaired by Quentin Sandifer (Public Health Wales), Claudia Perandones (ANLIS, Argentina), Silvio Brusaferrero (Istituto Superiore di Sanità, Italy)

Presentations from: Oswaldo Cruz Foundation (Fiocruz, Brazil), National Health Institute of Colombia, Public Health England, Saudi Center for Disease Control and Prevention (Kingdom of Saudi Arabia), Public Health Wales

Followed by an open discussion with delegates at the Annual Meeting

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