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WHAT CAN GLOBAL NORTH LEARN FROM GLOBAL SOUTH?

LESSONS FROM PAST
PANDEMICS AND EPIDEMICS

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About the Milken Institute

The Milken Institute is a nonprofit, nonpartisan think tank focused on accelerating measurable progress on the path to a meaningful life. With a focus on financial, physical, mental, and environmental health, we bring together the best ideas and innovative resourcing to develop blueprints for tackling some of our most critical global issues through the lens of what's pressing now and what's coming next.

About FasterCures

FasterCures, a center of the Milken Institute, is working to build a system that is effective, efficient, and driven by a clear vision: patient needs above all else. We believe that transformative and life-saving science should be fully realized and deliver better treatments to the people who need them.

About Jacobs

Jacobs is a professional services company that provides a full spectrum of services, including consulting, technical, scientific, and project delivery for the government and private sectors. With over 400 offices in 40 countries, Jacobs leads the global professional services sector, providing solutions for a more connected, sustainable world. Jacobs Health is a diverse, interdisciplinary team that specializes in connecting people and systems to advance global health. It partners with governments, public health officials, community leaders, scientists, and international organizations to improve health systems resilience, biosafety and biosecurity, disease surveillance, pandemic preparedness, and emergency management practices.

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EXECUTIVE SUMMARY

Much has been written about the substantial and troubling deficiencies exposed by the COVID-19 pandemic in the world's ability to respond to major public health crises. We do not aim to restate those deficiencies here. But as we enter the fourth year of the COVID-19 pandemic, it is incumbent on us to continue to reflect on our collective experience and to urge health-care decision makers and policymakers to apply the lessons of the past three years to prepare for future public health threats.

Background

Building on our respective work on lessons learned from COVID-19, Jacobs and FasterCures, a center of the Milken Institute, came together to pursue a research study to examine a paradox of COVID-19: Why did some high-income countries that have historically ranked highly on pandemic readiness indices fare relatively worse in their initial response to COVID-19 than some low- and middle-income countries (LMICs) that have historically ranked lower?

In approaching this work, we acknowledged that a range of factors could be at play in driving differential COVID-19 burden across countries, including differences in demographics and in the quality of data collection systems. While we focus on lessons learned from the experiences of LMICs, further evaluation of the impact of the pandemic on lives, livelihoods, and economies will certainly need to be conducted.

For this study, we sought to surface the more qualitative aspects of international COVID-19 responses, with three objectives in mind:

- highlight indicators of success that may or may not already be captured in current evaluation tools to assess pandemic preparedness,
- facilitate bidirectional learning and dialogue among countries in the Global North and in the Global South, and
- share learnings with state- and federal-level policymakers in the US and internationally.

Lessons Learned

Through the course of our research, we identified five key attributes that contributed to the success of initial COVID-19 responses by some countries in the Global South. Within each of these attributes, several lessons emerged:

Recent Outbreak Experience

1. Political and public health leaders who are responsible for managing health crises must have experience and/or knowledge of managing similar events. In the case of the COVID-19 response, leaders with previous experience or knowledge of pandemic prevention and response tended to understand the magnitude of the threat and act fast.

2. An effective early warning system is dependent on informed and alert clinicians and health practitioners who see patients face-to-face and are able to recognize anomalous cases even before they can be detected by surveillance systems. The health-care workforce must be trained to detect emerging diseases in order to improve a country's ability to respond in real time.
3. In noncrisis times, systems that are utilized for more routine activities such as childhood vaccination delivery, sentinel surveillance for chronic or endemic disease, or processes for disease reporting, should be designed and maintained to be repurposed during crises. In essence, countries that quickly elevated offline (cold) or routine (warm) systems into surge (hot) systems were able to address COVID-19 more rapidly and effectively.

Prior Investments and Public-Private-Academic Partnerships

1. Public health should be prioritized by governments, and adequate infrastructure and resources must be in place prior to an event so that they can be easily repurposed or scaled up to accommodate the next outbreak. In addition, it is important to have a mechanism in place that allows flexible access to and reallocation of funds during times of crises. This can be accomplished through a large reserve fund that is easily accessed and dispersed during an emergency. Relatedly, there should be a mechanism to access financial resources when needed and reallocate them where necessary or triggered by predefined thresholds.
2. Public-Private-Academic Partnerships (PPAPs) are critical for pandemic preparedness and response. Where nonexistent, there must be new mechanisms and legislation that support these multifaceted partnerships between the public, private, academic, and civil sectors to respond to any threat in public health. Mechanisms should account for reorientation of the workforce to fill critical workforce gaps during crises.
3. To ensure investments and PPAPs function as planned during crises, after-action reports should be timely, and countries should regularly train and perform tabletop exercises to enhance each partner's understanding of and performance in their role as well as to identify opportunities to improve capabilities.

Risk Communications and Community Engagement

1. Risk communication is most effective when coupled with justification, backed by scientific rationale, and locally relevant. Risk communication should be tailored for affected populations by considering their needs, beliefs, culture, and other relevant factors. Communications are most effective when utilizing established and trusted channels to share information with communities, such as technical experts, religious leaders, community health workers, and social influencers.
2. It is important to develop systems to detect disinformation. Such systems would monitor information at the local level and enable the development of targeted communications and engagement strategies to counter inaccurate messages.

3. Community engagement should start at the local level and work from the bottom up. It is imperative to develop trusting partnerships with the community by engaging members frequently and transparently especially in noncrisis times. This could be achieved by establishing a network of task forces from the regional to the local levels to deliver risk messaging and develop standard operating procedures to address health events.

Whole-of-Government Approach

1. A whole-of-government approach to pandemic response can best be achieved through formation of a task force or a steering committee, ideally established during noncrisis times to foster public trust and credibility.
2. Strategy, policy, and decision-making, ideally enabled by a whole-of-government task force, should be transparent, consistent, and cohesive, with all sectors consulted and represented.

Sustained Political Will, Leadership, and Trust

1. Sustained political will, including advocacy and support from the highest level of authority, is crucial to achieving a timely and effective crisis response.
2. For public health emergencies, effective leadership involves an understanding of basic public health concepts. Decision makers should be trained in basic public health concepts to prepare them for responding to a public health crisis.
3. Politics and science must be synergistic to engender public trust in research and science.
4. Trust in public health and science cannot be built over a short period of time and should be a consistent priority before, during, and after crises.

Conclusion

As the world continues to emerge from the COVID-19 pandemic and adjusts to a heightened awareness for pandemics and their impact, we urge health decision makers and stakeholders to:

- employ an intentional design approach to incorporate lessons learned in future pandemic preparedness roadmaps and frameworks at the international, national/federal, and regional/state levels;
- prioritize and build out PPAPs during noncrisis times, which will allow trust and relationships to be formed well in advance of health events;
- involve communities and diverse groups in the dialogue (response actions and preparedness activities should be designed jointly with target groups and/or communities);
- maintain bidirectional dialogue and ongoing learning to promote alignment of the global health community in defining next steps after COVID-19; and
- continue supporting financial mechanisms that can provide emergency preparedness funds and resources for health crisis events.

INTRODUCTION

Background

As of the end of 2022, 6.7 million lives have been lost to COVID-19.¹ This staggering death toll compels us to scrutinize our systems and processes for pandemic preparedness and response continually. With experts already predicting the next pandemic may be worse than COVID-19, we must take urgent action to strengthen our collective ability to confront future public health crises.

With this in mind, FasterCures, a center of the Milken Institute, has brought together a network of global experts in health, finance, data, and technology over the past three years to identify the areas in which investment may be most impactful in preventing future pandemics. This work led to a call for a globally coordinated early warning system that would have the capabilities to detect emerging pathogens and generate insights that can support outbreak response and decision-making. A vision and key considerations for such a system are captured in two Institute reports: [A Global Early Warning System for Pandemics: Mobilizing Surveillance for Emerging Pathogens](#) and [A Global Early Warning System for Pandemics: A Blueprint for Coordination](#).

Likewise, Jacobs heavily collaborates with its partners to create and maintain resilient health systems, including health infrastructure, operations, and governance components. During the COVID-19 pandemic, infrastructure and operations projects included rapidly converting medical centers to respond to patient surge, retrofitting manufacturing facilities to support vaccine production, planning and building testing sites, performing public transport network analysis for response, and developing a model to predict transmission rates under various operating scenarios. Health governance projects during the pandemic included supporting national biosafety and biosecurity legislation development in Liberia, Guinea, Senegal, Sierra Leone, and Ukraine; conducting a pandemic preparedness all-hazards needs assessment for Mercy Health System; and designing wastewater surveillance systems in the Middle East. Through these highlighted projects and global partnerships, Jacobs observed life-saving ingenuity and innovative approaches to pandemic preparedness. Further, it documented lessons learned during the pandemic in a panel session titled “Success Attributes from Past Epidemics and Pandemics—What Can Global North Learn from Global South?” during the Global Health Security Conference in Singapore in June 2022.

Building on this previous work on lessons learned, Jacobs and FasterCures came together to pursue a research study to examine a paradox of COVID-19: Why did some high-income countries that have historically ranked highly on pandemic readiness indices fare worse in their initial response to COVID-19 than some low- and middle-income countries that have historically ranked lower?

In approaching this work, we acknowledged that a range of factors could be at play in driving differential COVID-19 burden across countries. Differences in demographics, and in particular in population age structure, have been identified as important factors in explaining differences in mortality.² In addition, weak data collection and reporting systems could affect estimates of disease burden.³ While we focus on lessons learned from the experiences of low- and middle-

income countries (LMICs), further evaluation of the impact of the pandemic on lives, livelihoods, and economies needs to be conducted.

Through this study, we sought to surface the more qualitative aspects of international COVID-19 responses, with three objectives in mind:

1. Highlight indicators of success that may or may not already be captured in current methodologies to assess pandemic preparedness.
2. Facilitate bidirectional learning and dialogue among countries in the Global North and Global South.
3. Share learnings with state- and federal-level policymakers in the US and internationally.

Highlight Indicators of Success

The Global Health Security Agenda highlights the importance of health as a national security issue. Various capability and capacity evaluation tools, such as the World Health Organization (WHO) Joint External Evaluation (JEE)⁴ and the State Party Self-Assessment Annual Reporting (SPAR),⁵ are used to gauge countries' readiness levels. The COVID-19 pandemic discredited previously held assumptions that high JEE or SPAR scores could predict robust readiness and response. Some countries with lower scores and reported readiness levels performed better than expected in managing their COVID-19 response.

The COVID-19 experience suggests that current evaluation tools for pandemic preparedness may be missing important elements that help measure a country's capability and capacity to respond. Through the course of this research, we sought to identify additional indicators of success that may or may not already be currently captured in such tools.

Facilitate Bidirectional Dialogue

Throughout history, the Global North has traditionally dominated the transfer of ideas across national and regional boundaries. In the status quo, "best practices" from the Global North become the de facto models for the rest of the world.⁶

However, the COVID-19 pandemic highlighted successes that are unique to some countries comprising the Global South. In this study, we sought to identify best practices and success attributes from countries around the world that drove effective initial public health responses to the COVID-19 pandemic. This study aims to create balance in the setting of global best practices in outbreak prevention and preparedness standards by encouraging bidirectional learning between and among Global North and Global South countries.

A final aim is to share learnings with state- and federal-level decision makers and policymakers in the US and internationally. The intent of this report is to encourage the incorporation of lessons learned into future planning and response activities for health crises.

METHODOLOGY

Between July and December 2022, FasterCures and Jacobs interviewed nearly 30 international stakeholders across 18 countries (Appendixes 1 and 2). We targeted countries based on a qualitative evaluation of their success during the pandemic and COVID-19-related morbidity and mortality rates. We selected interviewees based on their public health expertise and involvement in pandemic mitigation or overall preparedness activities. We include anonymous quotes from interviewees throughout this report.

FIGURE 1: STUDY PROCESS DESCRIPTION AND TIMELINE



Source: Jacobs and Milken Institute (2023)

To guide our interview process, we developed a framework that integrates existing assessment frameworks, resilience tools, and literature, including the WHO JEE,⁷ the Global Health Security Index,⁸ the European Observatory on Health Systems and Policies Strengthening Health Systems Resilience Framework (2020),⁹ WHO's Strategic Framework for Emergency Preparedness (2017),¹⁰ and Nuzzo et al.'s scoping review of health systems resilience (2019).¹¹ The framework was designed as an initial conversation prompt versus an all-encompassing framework and was refined throughout the interview process based on stakeholder feedback.

In November 2022, Jacobs and FasterCures convened a hybrid in-person and virtual roundtable to present and discuss the interview findings. Thirty attendees, representing US federal policymakers, international interviewees, and representatives from US state and territorial associations, participated in the roundtable (Appendixes 2 and 3). The findings and lessons learned from the interviews and roundtable are captured in this report.

TABLE 1: INTERVIEW GUIDE AND FRAMEWORK

Pillar	Description	Factors
Overarching	Factors not otherwise considered or highlighted in existing resilience or GHS frameworks that may have significant, but not necessarily quantifiable, impact in pandemic, epidemic, and outbreak management	<ul style="list-style-type: none"> • Influence of Public-Private-Academic Partnerships • Localization of Capabilities • Recent Outbreak Management
Governance	Effective and participatory leadership with strong vision and communication, coordination of activities across government and key stakeholders, an organizational learning culture that is responsive to crises, effective information systems and flows, and surveillance enabling timely detection of shocks and their impact	<ul style="list-style-type: none"> • Political Will • Trust in Health Officials • Multisectoral Collaboration • Communications • Engagement • Early Warning Systems
Financing	Sufficient monetary resources in the system and flexibility to reallocate and inject extra funds, ensuring stability of health system funding through countercyclical health financing mechanisms and reserves, purchasing flexibility and reallocation of funding to meet changing needs, and comprehensive health coverage	<ul style="list-style-type: none"> • Health Coverage • Long Investments • Flexible Access • Crisis Funds
Resources	Appropriate level and distribution of human and physical resources, ability to increase capacity to cope with a sudden surge in demand, and motivated and well-supported workforce	<ul style="list-style-type: none"> • Critical Infrastructure • Workforce • Surge Capacity • Equity
Service Delivery	Alternative and flexible approaches to deliver care	<ul style="list-style-type: none"> • Basic Services Maintained • Flexible Delivery (e.g., Telehealth)

Source: Jacobs and Milken Institute (2023)

Limitations

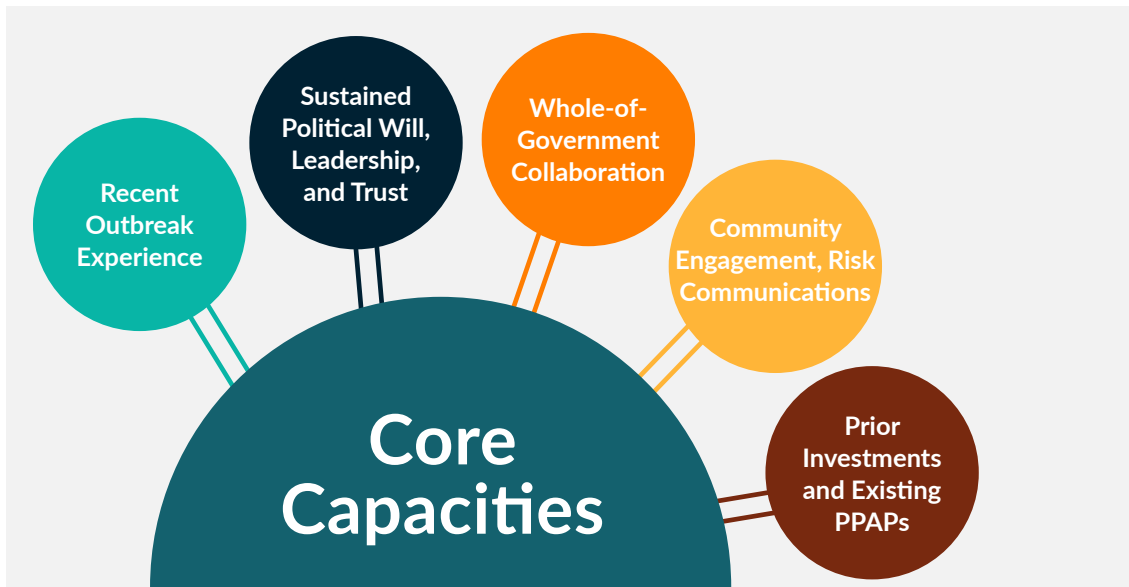
Because of the limited scope and accelerated timeline associated with this study, there are limitations to our research that could be addressed in future efforts. First, the study did not include a full academic literature review of pandemic successes; thus, there are likely additional success attributes beyond what we identify in this report. Similarly, our interviewees and associated countries do not represent a statistically significant sample size nor a comprehensive “all country” review, which necessarily implies gaps in our findings. In addition, the information we present may be skewed based on over- or under-representation of particular domains or backgrounds of those on our interviewee list; for example, some pillars such as service delivery or factors such as equity were simply not discussed at length because that expertise and experience were not fully represented among the people we interviewed. Likewise, our interviewees skewed toward industry, academia, and multilaterals, with limited representation from government entities. Therefore, not all viewpoints are represented equally. Despite these limitations, we present our discussion points and learnings as a starting point for further discussion and investigation.

DISCUSSION POINTS AND LESSONS LEARNED

Although we confirmed the well-studied understanding that core capacities such as trained epidemiologists and laboratory networks are critical for pandemic prevention, detection, response, and recovery, we uncovered several additional, somewhat qualitative, attributes that contributed to initial successes in some countries in the Global South. These qualitative attributes primarily fall under our framework’s governance pillar and were discussed by many participants as key enhancers of their existing core capacities. Indeed, these factors enabled active utilization of the core capacities that were in existence, something that was not necessarily seen consistently in countries with strong core capacities during COVID-19.

As noted in Figure 2, the success attributes include (1) recent outbreak or epidemic experience that spurred immediate action and understanding of the threat when early warnings were sounded; (2) ability to leverage existing or nascent investments and public-private-academic partnerships at the time of need; (3) strong community engagement, risk communications, and equitable approach that targets, and includes, local communities; (4) a willingness to employ a whole-of-government approach; and (5) the combination of sustained political will, strong leadership, and trust in public institutions.

FIGURE 2. SUCCESS ATTRIBUTES OF COVID-19 RESPONSES



Source: Milken Institute (2023)

Recent Outbreak Experience

Summary of Expert Discussions

Interviewees frequently discussed how recent experience managing past outbreaks or epidemics greatly impacted their country's ability to respond to COVID-19 quickly. Moreover, recent experience (whether good or bad) influenced a country's perception and understanding of the threat when international warnings were sounded.

Countries with a history of responding to outbreaks already have necessary outbreak response infrastructure and frameworks in place. For example, countries used Ebola, polio, and avian influenza Emergency Operation Centers and rapid response teams to cover COVID-19-related activities. Furthermore, countries with strong routine vaccination systems, developed in response to past outbreaks, were able to repurpose those systems during COVID for other activities, including distribution of vaccines. Being able to quickly mobilize existing tools, workforce, and materials used to fight previous outbreaks is a significant factor for success. Certain countries described themselves as being "pandemic aware." Past outbreaks have provided policymakers with lessons learned and helped to identify areas that need development and strengthening. Outcomes of previous learnings consist of national response plans, risk communication strategies, surge capacities, improved trainings, partnerships, and general awareness at the community level.

"We are very pandemic aware. This term is used to describe how we conduct ourselves in business and how we implement policy. I hope organizations can also take the pandemic response and see it as a critical baseline factor that needs to be incorporated into how people do their work or how programs and organizations run."

Furthermore, populations that have experienced a recent outbreak are accustomed to receiving public health guidance from political and health authorities and are typically more inclined to follow recommended health measures.

"You can have really good surveillance systems in place, but when it comes to picking up the first couple of cases, what actually works is an alert clinician, general practitioners thinking through the process... Having surveillance systems is a good thing, but realizing the limitations of the system is equally important."

While early warning systems were not discussed at length, interviewees provided unique perspectives on early warning systems and surveillance. Many highlighted that an early warning system is not an elaborate, digitized tool or platform that can be standardized for universal application; instead, they saw early warning as an approach to detection, based on specific country context such as resource level, disease burden, and spillover occurrence. An early warning approach must include informed clinicians and health practitioners who are able to recognize anomalous cases through the course of their encounters. Because they are based in the community and seeing patients face-to-face, these practitioners are able to detect cases of concern even before they can be captured by surveillance systems. However, health practitioners are often overlooked and undertrained in the early detection of emerging diseases.

“Early warning is not an elaborate platform or tool; it is an approach to detection based on the context and needs of the specific country.”

Lessons Learned

- 1** Political and public health leaders who are responsible for managing health crises must have experience and/or knowledge of managing similar events. In the case of the COVID-19 response, leaders with previous experience or knowledge of pandemic prevention and response tended to understand the magnitude of the threat and act fast.
- 2** An effective early warning system is dependent on informed and alert clinicians and health practitioners who see patients face-to-face and are able to recognize anomalous cases even before they can be detected by surveillance systems. The health-care workforce must be trained to detect emerging diseases in order to improve a country’s ability to respond in real time.
- 3** In noncrisis times, systems that are utilized for more routine activities, such as childhood vaccination delivery, sentinel surveillance for chronic or endemic disease, or processes for disease reporting, should be designed and maintained to be repurposed during crises. In essence, countries that quickly elevated offline (cold) or routine (warm) systems into surge (hot) systems were able to address COVID-19 more rapidly and effectively.

Prior Investments and Public-Private-Academic Partnerships

Summary of Expert Discussions

The COVID-19 response showcased the benefits of investing in research and science, as well as in public health infrastructure and workforce. In addition, public-private-academic partnerships (PPAPs) contributed to many countries' pandemic preparedness and response. For this study, we utilized several existing definitions of PPAPs to broadly evaluate partnerships of any form that contributes to outbreak and pandemic detection and response.

“Investment in pandemic preparedness, in surveillance, and in the overall scientific community has enabled non-pharmaceutical interventions to be quickly implemented because the community was ready, and this readiness was put in place before the arrival of the pandemic.”

Prior investments in fundamental resources are critical when dealing with a crisis surge. Adequate public health financing and access to additional funding during crises are directly linked to positive response outcomes. Governments with prior experience managing outbreaks appreciate the importance of preparedness and are willing to allocate funds and resources in anticipation of the next event. Past outbreaks have pushed certain affected countries to set public health financing as a top priority.

The interviews we conducted highlight the need to invest in applied science, surveillance methods, critical infrastructure, and human resource development—resources that cannot be purchased or developed rapidly in the face of a crisis. Interventions such as community engagement and communications must not be overlooked either.

“Success stems from the existence of scientific architecture or prior investment in infrastructure. These are things that you cannot put in place in the midst of a crisis.”

In multiple cases during the COVID-19 pandemic, preexisting infrastructure was repurposed to supplement the pandemic response. For example, exhibition arenas were converted into community care facilities for less severe cases to relieve the hospital surge. Hotels were repurposed as quarantine facilities, and the workforce was reoriented. Hotel receptionists possess the required skills to be effective contact tracers, and they were trained for contact tracing efforts. To combat supply-chain issues, countries focused efforts on localizing capabilities through state-owned enterprises; in one example, 3D printers were used to make swabs and masks within country. All of these successes were possible due to the willingness of the governments, industry, and academic institutions to work together toward a collective solution.

“What does epidemic-ready primary health care look like? We must build alert/response/coordination into service delivery. Health systems must be built in a way that basic services can be delivered during a response.”

Indeed, the interviews uncovered many additional examples of successful PPAPs, including scaling up health-care services, providing risk communications platforms, and innovating in vaccine and countermeasure development. These efforts were especially successful when the public sector recognized the private sector’s potential to innovate as opposed to viewing the private sector as actors with solely commercial interests:

- Private industry was used to manufacture oxygen cylinders for hospital use, working closely with public hospitals to understand demand better.
- In Nigeria, CACOVID, a public-private task force created at the start of the pandemic, utilized private-sector logistical resources to distribute food and supplies to communities and transport resources to support the government.¹²
- One nongovernmental organization coordinated with a task force to create an ambulance network, ensured infection prevention measures were established at facilities, and provided funds for the purchase and distribution of personal protective equipment.

Academic-government partnerships were also successful in developing health policy, providing scientific backing and credibility. In one case, prior to COVID-19, strong partnerships had already been forged between universities and the government through collaborations on a variety of health policies such as tobacco control, diabetes, and a new screening tool for cancer.

Generally, it is assumed that the government is responsible for developing these relationships to improve government decision-making; however, academia has a responsibility as well. When scientists can translate their research into a language that makes sense to policymakers, trust may be established between the two.

“The government’s willingness to cooperate with organizations outside of the government and receive advice to inform their decisions was notable. It is crucial that political will incorporates willingness to interact with the private sector and nonprofit organizations.”

Lessons Learned

- 1** Government should prioritize public health and put in place adequate infrastructure and resources prior to an event so that they can be easily repurposed or scaled up to accommodate the next outbreak. In addition, it is important to have a mechanism in place that allows flexible access to and reallocation of funds during times of crises. This can be accomplished through a large reserve fund that is easily accessed and dispersed during an emergency. Relatedly, there should be a mechanism to access financial resources when needed and reallocate where necessary or triggered by predefined thresholds.
- 2** PPAPs are critical for pandemic preparedness and response. Where nonexistent, there must be new mechanisms and legislation that support these multifaceted partnerships among the public, private, academic, and civil sectors to respond to any threat in public health. Mechanisms should account for reorientation of the workforce to fill critical workforce gaps during crises.
- 3** To ensure investments and PPAPs function as planned during crises, after-action reports should be timely, and countries should regularly train and perform tabletop exercises to enhance each partner's understanding of and performance in their role as well as to identify opportunities to improve capabilities.

Risk Communications and Community Engagement

Summary of Expert Discussions

Scientifically sound and timely information, advice, and opinions enable affected populations to make informed decisions and take protective or preventive measures.¹³ Countries within our study utilized various media platforms to update the public on infection prevention measures, vaccines and their roll-out strategies, and new guidelines for COVID-19. Governments also shared information about testing and treatment sites.

“We must address the issue of health education, health information, and health promotion. There must be a system for health education messages that mobilizes the public and is sensitive to the locality.”

Risk communication is most effective when coupled with justification and scientific rationale. Interviewees noted that when communicating during a crisis, communicators must be truthful, respect public sentiment, and keep information clear and straightforward. In addition, to maintain the utmost credibility, they must assume accountability as soon as certain theories about a virus and its spread are debunked and public health guidance changes. In many cases, risk communication proved more effective when messaging channels shifted from political leaders to community health workers; however, this depended on the phase of the pandemic. For example, certain populations initially wanted to hear from government and public health officials. As the pandemic evolved and misinformation spread, there was a shift toward a desire to hear from trusted community leaders.

“To counter misinformation in the media, we engaged influencers such as community leaders and opinion leaders. The president got vaccinated, and we used his pictures to push for a surge in vaccinations nationally. This helped increase the level of trust with the public as well.”

Countries also utilized nontraditional communication methods to better reach communities and compensate for any distrust toward government or health officials. Methods included the use of influencers both in the community and on social media and the use of modern social platforms (e.g., Twitter, Facebook, TikTok) to capture various audiences. Engagement of the media was a common theme in addressing misinformation and contributing to rumor management.

Moreover, public health outcomes are improved with early involvement and collaboration with local communities on matters that affect their health and well-being.¹⁴ During COVID-19, many communities shifted from an informal group of volunteers to a formal structure of community leaders to combat government mistrust. Indeed, early community engagement is critical in building trust and preventing spread of misinformation and panic. Tools for monitoring

information exchange are helpful in this process and local communities play a critical role. For example, a rumor management system where community members monitor local conversations, via a call center or social media platforms, help public health leaders understand the misconceptions circulating in the communities and identify critical information gaps.

“The power of community engagement is crucial in terms of education and tailored messaging. If communities do not understand the routes of transmission, the disease cannot be controlled.”

While we were unable to examine the full impact of equity during this study, we found that countries that prioritized an equitable approach to community engagement and countermeasures had a larger perceived impact on all segments of the population. Where countermeasures were targeted to local context, our interviewees noted higher compliance and understanding of the threat. Equity in pandemic preparedness, response, and recovery will need to be studied further.

Lessons Learned

- 1** Risk communication is most effective when coupled with justification, backed by scientific rationale, and locally relevant. Risk communication should be tailored for affected populations by considering their needs, beliefs, culture, and other relevant factors. Communications are most effective when utilizing established and trusted channels to share information with communities, such as technical experts, religious leaders, community health workers, and social influencers.
- 2** It is important to develop systems to detect disinformation. Such systems would monitor information at the local level and enable the development of targeted communications and engagement strategies to counter inaccurate messages.
- 3** Community engagement should start at the local level and work from the bottom up. It is imperative to develop trusting partnerships with the community by engaging members frequently and transparently especially in noncrisis times. This could be achieved by establishing a network of task forces from the regional to the local levels to deliver risk messaging and develop standard operating procedures to address health events.

Whole-of-Government Approach

Summary of Expert Discussions

Pandemic response requires a whole-of-government approach which, in many of the countries we included in our interviews, was accomplished through the formation of an intragovernmental task force or steering committee. The main functions of these task forces and steering committees were to provide a coordinated approach to pandemic response, communicate with stakeholders, provide guidance on public health measures, and allocate resources.

In the majority of countries that employed a whole-of-government approach, the main health agency led task forces that convened various government agencies and other organizations in the finance, communications, transportation, trade, and education spaces. Many task forces expanded beyond the traditional scope to include academic, community, and religious leaders. Some teams included economists to ensure public health decisions were made with a full understanding of their potential economic impact.

In most cases, these whole-of-government task forces were initiated in response to the pandemic and had little experience working together and/or responding to an outbreak. Our interviewees noted many good whole-of-government task force examples, including in Sierra Leone, Singapore, Nigeria, and Angola. In addition, many countries used previously built resources, such as One Health platforms, to facilitate whole-of-government coordination. Experience with and reliance on preexisting whole-of-government platforms greatly enhanced COVID-19 response capabilities in those countries.

In addition, interviewees highlighted the importance of having standing science committees to advise government, guide media, and interact with the community. Such committees need to be composed of unbiased, accredited scientists, and the relationship between scientists and policymakers must be established in noncrisis times and requires long-term investment. We also found that a coordinated, whole-of-government approach enhances pandemic response governance and improves overall messaging to the public. Further, whole-of-government collaboration improves public trust in government if the team or task force communicates with the public in a consistent and transparent manner.

Lessons Learned

- 1** A whole-of-government approach to pandemic response can best be achieved through formation of a task force or a steering committee, ideally established during noncrisis times to foster public trust and credibility.
- 2** Strategy, policy, and decision-making, ideally enabled by a whole-of-government task force, should be transparent, consistent, and cohesive, with all sectors consulted and represented.

Sustained Political Will, Leadership, and Trust

Summary of Expert Discussions

Public health successes depend on a sustained engagement with political leaders and various government structures.¹⁵ Political will for public health at a minimum includes access to funding and resources, partnerships and collaboration, trust in science and research, and transparent communications. Continuous engagement and demonstrated political will improve public trust in public health and political leaders, even if there was previous distrust in government. In line with governmental, academic, and anecdotal reviews of the COVID-19 and other epidemic responses across the world, we found that political will, strong leadership, and trust in government were perhaps the most critical success attributes and underpin all other success factors.

Indeed, in countries where the COVID-19 pandemic either created or strengthened existing political will to support public health, such sentiment fostered the aforementioned whole-of-government, multisectoral approaches and the use of scientific evidence for decision-making. Our interviewees frequently noted that political will must include ensuring that decisions are evidence-based and free from political influence. Moreover, political leaders who were transparent with their decision-making, guided by scientific evidence, had more success with public compliance with regulations. Last, it is important to note that political will is only the first step and must be followed by political commitment.

Relatedly, interviewees noted the need for effective leadership during public health emergencies. Although authoritative management can push the public to comply with regulations, it may only have a short-term effect as heavy-handed management can quickly lead to distrust in government. Effective leaders, especially if educated in public health and with recent outbreak management experience, were more aware of risk and more likely to rely on science-based decision-making. This combination empowered leaders to utilize, trust, and even defer to their whole-of-government task forces.

Finally, public trust is critical to ensuring compliance with countermeasures or guidance. Interviewees frequently pointed out several key factors that contributed to the public's trust in government and health officials: transparency, accountability, and humility. Yet, all noted that trust cannot be built during a crisis. Countries that were able to effectively utilize already-trusted leaders (e.g., technical experts, community health workers, religious leaders, influencers) to relay messages and promote countermeasures tended to yield a higher level of compliance.

Lessons Learned

- 1 Sustained political will, including advocacy and support from the highest level of authority, is crucial to achieving a timely and effective crisis response.
- 2 For public health emergencies, effective leadership involves an understanding of basic public health concepts. Decision makers should be trained in basic public health concepts to prepare them for responding to a public health crisis.
- 3 Politics and science must be synergistic to engender public trust in research and science.
- 4 Trust in public health and science cannot be built over a short period of time and should be a consistent priority before, during, and after crises.

FINAL CONSIDERATIONS

In addition to core competencies, we identified several success attributes through our Global South to Global North conversation. By looking at success through a different lens, we can identify what might be a key combination of factors to enhance core capacities. However, what do we do with such information, and what comes next?

At a high level, it is important to note that none of these attributes, or combinations thereof, is simple to develop. Certainly, through our conversations we found wide variability in the intentionality of having one or more of a specific attribute; a country could have achieved such an attribute by design, by accident, or simply by having a particular cultural outlook or political leader. Nonetheless, creating and sustaining such attributes is possible through deeper analyses into root causes, implementation methodologies, or case studies on particular or potential models of success. Doing such analyses will be important to inform capability-building efforts for countries, states, and localities.

In addition, not all of the key success attributes are consistently monitored or measured by existing pandemic readiness and resilience measurement frameworks, such as the JEE and SPAR. It will be important to consider how to incorporate such attributes where missing and conduct further study on how to replicate and measure success.

Achieving success will take many different forms and must account for country, state, or local context. For example, within **Sustained Political Will, Leadership, and Trust**, a common trend in countries that elicited an effective response to COVID-19 was a summation of their system of governance, culture, and community engagement rather than their abundance of resources. It is important to acknowledge that political will does not equate to strong leadership or public trust and that culture plays a critical role. Acknowledging the difficulty of influencing culture is important to consider for targeting mitigation strategies appropriately.

Within **Whole-of-Government Approach**, where politics inevitably surface, it will be important to devise new relationships or capitalize on previously established trusted relationships. The Federal Emergency Management Agency disaster response model could be one such approach to consider and should be studied for applicability, at least for countries with federated political systems.

Through our collective COVID-19 experience, the global health community recognizes the criticality of effective **Risk Communications and Community Engagement** approaches, targeted for and with the local affected community. We must continue to include health education, health information, and health promotion as components of global health frameworks, using a bottom-up, locally relevant approach as much as possible.

The critical importance and success of **Prior Investments and PPAPs** during the COVID-19 pandemic have been discussed widely; however, we point out that future, long-term investments and PPAPs must employ sustainable approaches, such as task forces, committees, and in-kind partnerships among government and scientists. It may be necessary for countries and/or states to perform a sustainability analysis of COVID-19-related PPAPs and investments.

It is clear that **Recent Experience** had a significant impact on a country's perception of threat and willingness to act. A potential approach to replicating this success factor is ensuring consistent tabletop and field training and exercises; however, it will be important to sustain momentum and ensure that the right people are involved. As such, it may require analysis of pre-COVID-19 pandemic plans against the COVID-19 reality to ensure the identification of gaps in human resources or future plans. In addition, where it is not already, training and exercises should be their own indicator within relevant GHS frameworks.

CONCLUSION

As the world continues to emerge from the COVID-19 pandemic and adjusts to a heightened awareness of pandemics and their impact, we urge health decision makers and stakeholders to:

- employ an intentional design approach to incorporate lessons learned into future pandemic preparedness roadmaps and frameworks at the international, national/federal, and regional/state levels;
- prioritize and build out PPAPs during noncrisis times, which will allow trust and relationships to be formed well in advance of health events;
- involve communities and diverse groups in the dialogue (response actions and preparedness activities should be designed together with target groups and/or communities);
- maintain bidirectional dialogue and ongoing learning to promote alignment of the global health community in defining next steps after COVID-19; and
- continue supporting financial mechanisms that can provide emergency preparedness funds and resources for health crisis events.

APPENDIX 1: COUNTRIES REPRESENTED IN INTERVIEW PHASE

FIGURE 3. COUNTRIES REPRESENTED IN THE STUDY



APPENDIX 2: INTERVIEW PARTICIPANTS

Country	Name	Affiliation
Angola	Jose Moura	Administrator for Equilibrium, Sistemas de Informação
Australia	Raina MacIntyre	Head, Biosecurity Program, and Professor of Global Biosecurity, Kirby Institute; Principal Research Fellow, National Health and Medical Research Council
Bangladesh	Quazi Tarikul Islam	Professor of Medicine, Popular Medical College
Bangladesh	Mahmudar Rahman	Former Director, Institute of Epidemiology, Disease Control and Research and National Influenza Center
Brazil	Anderson Brito	Research Scientist at Instituto Todos pela Saúde
Colombia	Ramiro Guerrero Carvajal	Principal Specialist in the Social Protection and Health Division, Inter-American Development Bank
Democratic Republic of Congo	Didier Mbayi Kangudie	Senior Regional Health Advisor, USAID West Africa mission
General	Sara Hersey	Senior Technical Advisor, Epidemic Prevention, Resolve to Save Lives
Georgia	Amiran Gamkrelidze	Director-General, National Center for Disease Control & Public Health of Georgia
Guinea	Amiata Kaba	Senior Technical Advisor, Breakthrough ACTION
Mexico	Roberto Tapia-Conyer	Director, Carlos Slim Foundation; Chairman, National Board of Youth Integration Centers
Nigeria	Babafunke Fagbemi	Executive Director, Centre for Communication and Social Impact
Nigeria	Vivianne Ihekweazu	Managing Director, Nigeria Health Watch
Nigeria	Abdulsalami Nasidi	Acting Executive Director, Economic Community of West African States Regional Surveillance and Disease Control Centre
Nigeria	Oyewale Tomori	Former President, Nigeria Academy of Science; Board Member, Global Virome Project
Pakistan	Rana Jawad Asghar	CEO, Global Health Strategists and Implementers
Senegal	Papa Serigne Seck	Technical Advisor, Presidential Cabinet
Sierra Leone	James Fofanah	Chief of Party, Johns Hopkins Center for Communication Programs Breakthrough ACTION Sierra Leone

Country	Name	Affiliation
Singapore	Yee-Sin Leo	Executive Director, National Centre for Infectious Diseases
Singapore	Tikki Elka Pangestu	Chair, Asia Pacific Leaders Malaria Alliance; Co-Chair, Asia Pacific Immunization Coalition; Past Director, Research & Policy Cooperation, World Health Organization
Singapore	Paul Ananth Tambyah	President, Asia Pacific Society of Clinical Microbiology and Infection
Singapore	Teo Yik Ying	Dean, Saw Swee Hock School of Public Health, National University of Singapore
Tanzania	Zachariah Makondo	Principal Public Health Researcher and Laboratory Manager, Ministry of Agriculture, Livestock and Fisheries
Thailand	Supaporn Wacharapluesadee	Senior Researcher, Emerging Infectious Diseases Clinical Center, King Chulalongkorn Memorial Hospital; Former Deputy Chief, Thai Red Cross Emerging Infectious Diseases Health Science Centre
Uganda	Betty Mirembe	Country Director for Uganda, PATH
Vietnam	Todd Pollack	Country Director, The Partnership for Health Advancement in Vietnam

APPENDIX 3: ROUNDTABLE PARTICIPANTS

Agency	Participant
Association for State and Territorial Health Officials	Meredith Allen
Association for State and Territorial Health Officials	Marcus Plescia
Centers for Disease Control and Prevention	Jay Butler
Centers for Disease Control and Prevention	Dylan George
Defense Threat Reduction Agency	Ada Bacetty
Defense Threat Reduction Agency	Rebecca Dunfee
Department of Health and Human Services	Paul Reed*
Department of State	Maureen Bartee*
Department of State	Emily Kelley
Food and Drug Administration	Kevin Bugin
National Security Council	Mark Lucera
National Security Council	David Stiefel
Uniformed Services University	Danny Shiao
United States Agency for International Development	Tracey Goldstein
White House	Rachael Fleurence
White House	Nahid Bhadelia

**Paul Reed and Maureen Bartee were unable to attend the roundtable in person but reviewed this report.*

ENDNOTES

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ABOUT THE AUTHORS

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Sung Hee Choe is a senior director at FasterCures, a center of the Milken Institute, where she oversees the programmatic portfolio and is responsible for day-to-day operations. Choe also leads several of FasterCures' programs related to biomedical innovation and global health. Prior to joining FasterCures, she was a managing director at Avalere Health, a strategic advisory company. In this role, Choe worked with public and private stakeholders on a range of health policy topics and developed a suite of syndicated research products. Before Avalere, Choe spent a decade in the financial services industry, most recently at BNY Mellon, as a health-care equity analyst. Choe received her bachelor's degree from Mount Holyoke College and a master of public health from the Milken Institute School of Public Health at George Washington University. She is also a Chartered Financial Analyst® charter holder.

Esther Krofah is the executive vice president of health and is on the leadership teams for FasterCures and the Center for Public Health at the Milken Institute. She has deep experience in the government, nonprofit, and for-profit sectors, where she has led efforts to bring together diverse stakeholder groups to solve critical issues and achieve shared goals that improve the lives of patients. Most recently, Krofah was the director of public policy leading GlaxoSmithKline's (GSK) engagement with the US Department of Health and Human Services (HHS) and relevant executive branch agencies on broad health-care policy issues, including leadership in improving vaccinations and care for people living with HIV. Prior to GSK, Krofah served as the deputy director of HHS' Office of Health Reform, where she led the development of policy positions for significant regulatory priorities, including the health insurance marketplaces. Prior to HHS, Krofah served as a program director at the National Governors Association (NGA) health-care division, working directly with governors' health policy advisors, state Medicaid directors, and state health commissioners on health insurance, health workforce, and Medicaid coverage issues. Before joining the NGA, Krofah worked in consulting at Deloitte Consulting LLP, where she worked with public-sector and commercial clients, including assisting states in developing state-based exchanges. Krofah received a bachelor's degree from Duke University and a master of public policy from the Harvard University John F. Kennedy School of Government.

Leah Goodman is a consultant for Jacobs, where she supports all global health activities. Goodman earned her graduate degree in biohazardous threat agents and emerging infectious diseases from Georgetown University. Relevant coursework focused on biosafety and biosecurity, policy, and pandemic management. Her studies highlighted research and analysis as well as the Defense Threat Reduction Agency's Cooperative Threat Reduction (CTR) and Biological Threat Reduction Program (BTRP). In conclusion of her studies, Goodman completed a thorough policy analysis focusing on the CTR Program's ability to counter disinformation surrounding BTRP and provided recommendations to improve communication.

Nino Kharashvili, MD, is Jacobs' global health director for health system governance, where she focuses on health system resilience and preparedness. As an international health professional, she has working knowledge of 40 different countries across the former Soviet Union, Africa, Southeast Asia, and Middle East. She has over 20 years of international health consulting experience and has managed teams specializing in global health security, health system resilience, health policy, and so on. Kharashvili has a breadth of experience in defining paths for health system sustainability and resilience, as well as designing and implementing various pandemic preparedness exercises aimed at improving public health emergency preparedness and response. Kharashvili partnered with global health agencies to implement health system strengthening projects, assess national and multisectoral emergency response capacities, address resource challenges and constraints, and enhance communication strategies.

Katie O'Connor is a senior associate at FasterCures, a center of the Milken Institute, providing research support on various workstreams, including health equity and oncology. Prior to FasterCures, O'Connor worked as a research associate at Truth Initiative, where she advanced health outcomes and health communication research in the context of tobacco and e-cigarette use. In addition to health equity and oncology, O'Connor's interests lie in maternal and child health, mental health, and substance use disorder research. O'Connor received her master's degree in public health with a concentration in global health epidemiology and disease control from the George Washington University and a bachelor of science in psychology and a minor in neuroscience from the University of Pittsburgh.

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Alisha Sud is an associate director at FasterCures, a center of the Milken Institute. In her role, she supports work related to health equity, cell and gene therapies, and global pandemic early warning system development. Prior to joining FasterCures, Sud was an analyst at international strategic advisory firm Albright Stonebridge Group, where she worked with health clients on government affairs and business strategy. Sud received a bachelor of arts in international development and Mandarin Chinese from the University of Vermont, a certificate in international studies from the Johns Hopkins University School of Advanced International Studies, and is a master of public health candidate at the Bloomberg School of Public Health.



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