ECONOMIST IMPACT

Building health system resilience in an uncertain world

An Economist Impact report

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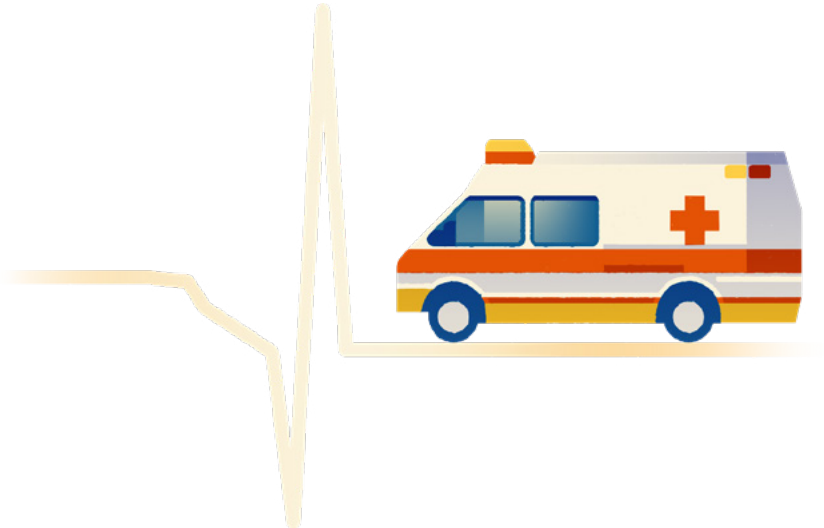

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About this report

"Building health system resilience in an uncertain world" is a report written by Economist Impact and supported by UNOPS, the UN agency with a core mandate for infrastructure, project management and procurement. This paper explores key strategies for strengthening health systems in low- and middle-income countries, including the role of governance, financing, procurement and infrastructure in building resilience, and draws on a series of in-depth interviews.

Economist Impact wishes to thank the following experts, who kindly agreed to participate in the interview programme for this report (ordered alphabetically by surname):

- **Dr Shyam Bishen**, head of health and healthcare, World Economic Forum
- **Dr Somsak Chunharas**, president of the Thai National Health Foundation and former deputy minister of public health for Thailand
- **Francesca Colombo**, head of health division, OECD
- **Professor Lucy Gilson**, professor of health policy and systems, London School of Hygiene & Tropical Medicine/University of the Western Cape
- **Janeen Madan Keller**, senior policy analyst and assistant director of global health, Center for Global Development
- **Stefan Nachuk**, senior advisor, health systems, Bill & Melinda Gates Foundation

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Introduction

A multitude of shocks—including the covid-19 pandemic, ongoing conflicts around the world, climate change and economic instability—have severely challenged global health systems in recent years.

Although it is likely that the most acute impacts of the pandemic are behind us, further shocks are inevitable and turbulence is mounting. Emerging risks include new infectious disease outbreaks (as illustrated by the recent surge in monkeypox cases) and supply-chain disruption, as well as slower-burn stressors such as ageing societies and increasing incidence of non-communicable diseases (NCDs). In particular, the climate crisis constitutes a severe threat to global health, given the increasing frequency of extreme weather events such as floods, heatwaves and droughts.

Developing the resilience of health systems will ensure that they are able to withstand the pressures of acute shocks and longer-term, chronic threats. This is particularly important in low- and middle-income countries (LMICs), which are typically less well equipped to finance and resource health systems' responses to surges in demand. The last few years have demonstrated the significance of health system resilience, particularly in LMICs. There is now a window of opportunity to consider what actions can be taken to strengthen health system resilience.

This report draws on interviews conducted with a number of experts to examine the value of building resilient health systems (Chapter 1), the challenges in building resilience within LMICs (Chapter 2), and what strategies, including improvements in procurement processes and health infrastructure spending, can be adopted to foster resilience (Chapter 3). Key findings include:

- Strong co-ordination at the supra-national level is particularly important when countering global threats to public health, such as infectious disease outbreaks and climate change.
- Value-based healthcare (VBHC), whereby providers are paid for patient outcomes rather than the services they supply, can ensure that healthcare financing is used more effectively and incentivise activities and investments that are beneficial for day-to-day operations and the emergency preparedness of health systems.[1]

[1] https://impact.economist.com/perspectives/sites/default/files/EIU_Medtronic_Findings-and-Methodology_1.pdf

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- Digital technologies can help to improve access to healthcare services and reduce costs for patients. However, they must be considered a complement—rather than a substitute—to investments in other areas of a health system.
- Increased transparency in procurement processes plays an important role in enabling health systems to purchase and maintain adequate stocks of medical supplies, thus fostering health systems resilience.
- Dispersed and mobile networks of basic healthcare facilities can ensure greater healthcare coverage, particularly for underserved populations. Furthermore, the design and location of such physical infrastructure will play an increasingly important role in determining resilience against climate change-related threats.

What is health system resilience?

The covid-19 pandemic has drawn the attention of policymakers, healthcare providers and the general public to the importance of health system resilience. However, there is little consensus on how to define it. Academics disagree as to whether the term should only apply to the resilience of health systems against acute shocks (such as pandemics or natural disasters) or whether it should also account for resilience against chronic stresses (such as antibiotic resistance or an ageing population). This report adopts an expansive definition of resilience, covering a wide variety of threats and challenges that health systems may face. This approach, which was corroborated by our interviews with experts in the field, is modelled on that set out by Hollnagel et al (2013), who define resilience as "the ability of the healthcare system (a clinic, a ward, a hospital, a country) to adjust its functioning prior to, during or following events (changes, disturbances and opportunities), and thereby sustain required operations under both expected and unexpected conditions."[2]

For this report, our interpretation of resilience captures the capacity of health systems to (i) prepare for and effectively respond to crises (including both acute shocks and chronic stresses); (ii) maintain provision of essential healthcare services during periods of crisis; (iii) demonstrate flexibility, such that health systems adapt with agility to changing population needs, pressures and contexts; (iv) learn from experience, with the result that health systems are able to improve their responses to challenges over time.

[2] Hollnagel, E. et al. (2013). Resilient health care. Ashgate Studies in Resilience Engineering. Surrey, UK: Ashgate Publishing.

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Chapter 1: The value of resilient health systems

Health systems will always face diverse and unpredictable challenges. Building resilience will help countries circumvent future costs, while also generating broader health and social benefits in times of stability.

The costs of under-investment

The covid-19 pandemic has tragically demonstrated the costs that can result from a lack of health system preparedness. Shortages in essential medical supplies such as personal protective equipment (PPE) were a major problem in many countries. In some instances, lack of PPE meant that medical staff and other front-line workers were forced to continue working without adequate protection, increasing their likelihood of exposure and onward transmission of the virus.[3] Furthermore, health systems were unprepared to respond to shortages in the medical workforce, which arose as a result of the twin pressures of increased demand and higher absenteeism due to sick or quarantining medical professionals. These shortages exacerbated issues of overcrowding in emergency departments. Finally, lockdown measures resulted in the delay or cancellation of routine health services, including vaccinations and elective surgeries. Crucially, the effects of health service disruptions and lockdown measures were more pronounced among the most vulnerable groups, thus widening pre-existing health and socio-economic disparities.

Health systems' under-preparedness for the pandemic also had damaging impacts on the broader economy and society. Illness and worker absenteeism, which arose as a result of the poorly controlled spread of the virus, resulted in productivity losses and lower tax revenues for governments. Overall, the pandemic instigated a worldwide economic contraction, leading to a drop in real GDP of 2.2% in 2020 in emerging-market and developing economies.[4] The protracted economic downturn threatens to set back decades of progress in healthcare and poverty reduction made within LMICs and hampers progress towards achieving the UN Sustainable Development Goals (SDGs). For instance, extreme poverty, defined as the proportion of people living on less than US$1.90 a day, rose by roughly 3% in West Africa in 2020.[5]

[3] https://www.bbc.com/news/newsbeat-52440641
[4] https://blogs.imf.org/2021/04/06/managing-divergent-recoveries/
[5] https://news.un.org/en/story/2022/01/1110192

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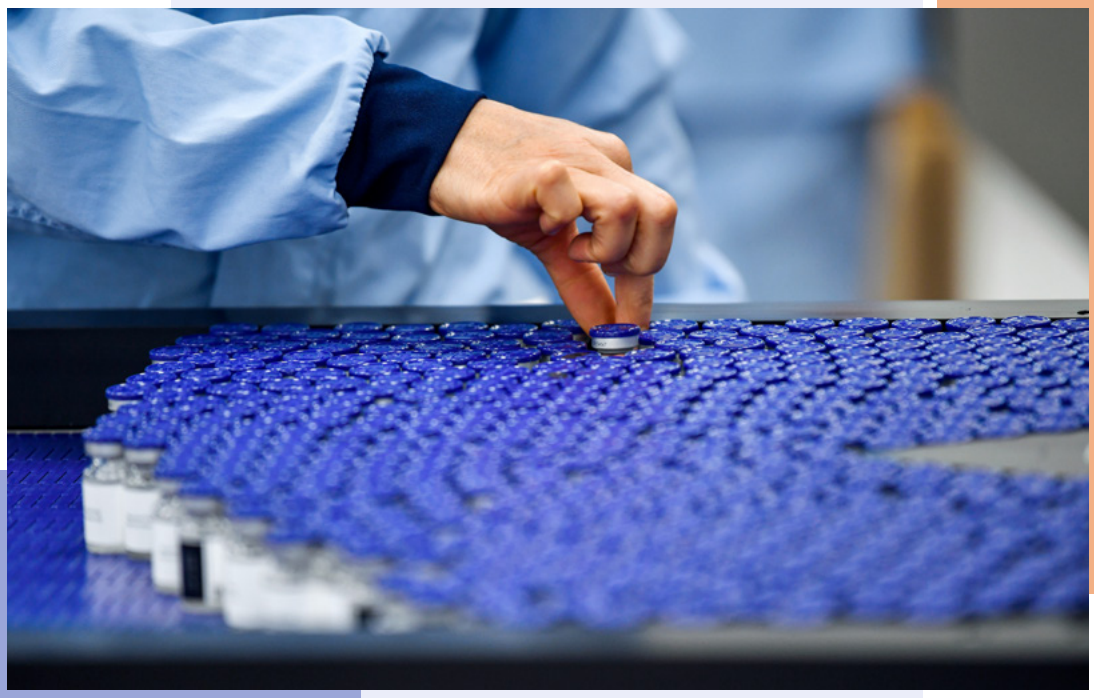

The pandemic's impact on government budgets is likely to have long-lasting repercussions for access to healthcare, particularly in LMICs. Many governments were forced to spend large sums of money on their pandemic response programmes, in spite of their tax revenues being significantly reduced. This has led to the accumulation of high volumes of government debt. Servicing this debt in the future may force governments to constrain public budgets, including expenditure on health.[6] This is particularly true of LMICs, whose governments face tighter funding constraints than their wealthier counterparts. LMICs' government budgets have also been threatened by recent macroeconomic disturbances, owing to the fact that their economies have typically been more exposed to pandemic-related disruptions to trade, travel and foreign direct investment.[7]

The argument for investing in strengthening health systems is not limited to mitigating the costs incurred by future pandemics. A multitude of other threats will challenge the functioning of health systems in the future, and proactive investment in building resilience today is crucial to early action and thus minimising the impact of these threats. Shyam Bishen, head of health and healthcare at the World Economic Forum, notes that a range of threats are likely to impact health system resilience in LMICs, including the spread of infectious diseases, increasing incidence of cardiovascular diseases, worsening mental health and increasing frequency of extreme weather events arising from global warming.

"Unless health systems are made to be strong, sustainable and resilient, we will face serious challenges in future."

Dr Shyam Bishen, World Economic Forum

[6] World Health Organisation. (2020). Global spending on health: Weathering the storm. https://www.who.int/publications/i/item/9789240017788
[7] World Health Organisation. (2020). Global spending on health: Weathering the storm. https://www.who.int/publications/i/item/9789240017788

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The resilience dividend

By definition, building the resilience of health systems should improve a country's capacity to prepare for and respond to a crisis. However, some have argued that improvements in resilience should also yield everyday benefits to population health.[8] Margaret Kruk, a professor of health systems at Harvard University, calls this double benefit to health system performance, in times of both crisis and stability, "the resilience dividend". This is because the building blocks of a resilient system—whether a skilled healthcare workforce, strong data tracking capabilities or a high level of public trust in health institutions—also support the equitable and effective delivery of health services on a day-to-day level.[9]

A resilient health system can help to mitigate the costs imposed by acute and chronic threats on health, social and economic outcomes. Crucially, however, the resilience dividend means that building resilience also helps to drive improvements in health outcomes more broadly. Furthermore, the value of health system resilience can also be understood through its contribution to achieving the SDGs (see insert: "Building health system resilience: a key pillar of the Sustainable Development Goals"). These benefits are particularly salient in the case of LMICs, where limited government budgets mean that the value of investments in resilience must be made especially clear.

"Investments that you are making today to improve the performance of your health system—that is, addressing things like basic infectious disease problems or maternal child health— will have the added benefit of helping you prepare for an unexpected event."

Stefan Nachuk, Bill and Melinda Gates Foundation

[8] Kruk, M. et al. (2015). What is a resilient health system? Lessons from Ebola. Lancet 385(9980): 1910-2
[9] https://www.theglobalfund.org/en/resilient-sustainable-systems-for-health/

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"If a system is resilient it can better cope in a crisis—but it can also use those characteristics to do many other things in a positive way. Resilience is beneficial for health in general."

Dr Somsak Chunharas, president of the Thai National Health Foundation and former deputy minister of public health for Thailand

Building health system resilience: a key pillar of the Sustainable Development Goals

Health system resilience is highly interlinked with the UN Sustainable Development Goals (SDGs). In particular, it has the potential to make a valuable contribution to the following:

SDG 2: Zero Hunger—End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.

Threats to global nutrition are set to increase as climate change exacerbates the frequency of extreme weather events, including heatwaves, floods and droughts. Building the resilience of health systems—such as by extending the reach of emergency care across remote rural areas—will also help to mitigate the impacts of acute food shortages and malnutrition.

SDG 3: Good Health and Wellbeing—Ensure healthy lives and promote wellbeing for all at all ages.

Ensuring the health and wellbeing of the general public is contingent on health systems' capacity to effectively respond to threats and challenges, whether acute or chronic. Furthermore, initiatives aimed at building resilience, such as expanding access to healthcare services in remote, underserved areas, will concurrently accelerate progress towards universal healthcare coverage.

SDG 5: Gender Equality—Achieve gender equality and empower all women and girls.

Gender disparities in access to healthcare constitute a major barrier to fostering resilience in many LMICs; a study in Central Malawi found that women were less likely than men to receive financial aid for healthcare (68.8% versus 88.8%) and more likely to underuse critical healthcare services (37.2% versus 22.4%).[10] As such, initiatives aimed at building health system resilience can simultaneously bring about improved health outcomes for women.

It is estimated that an additional 18m health workers are needed in LMICs by 2030 in order to achieve the SDGs.[11] Thus, boosting the participation of women in the healthcare system can play a critical role in enhancing capacity within the healthcare workforce and fostering resilience.

[10] Azad, A.D. et al. (2020). The gender gap and healthcare: associations between gender roles and factors affecting healthcare access in Central Malawi. Arch Public Health 78: 119
[11] Ayaz et al. (2021). Participation of women in the health workforce in the fragile and conflict-affected countries: a scoping review. Hum Resour Health.19 (94): 1-14.

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Chapter 2: Building resilient systems – the challenges

Despite strong incentives to shore up health system resilience, significant challenges—health system fragmentation, limited domestic resourcing, constrained manufacturing capacity and poor procurement practices— remain stubborn barriers to resilience.

There are strong incentives for all countries to build resilience in their health systems. However, a number of barriers hinder progress towards building resilience in LMICs. Remedying these deficiencies is crucial to ensuring that health systems can effectively respond to future challenges and threats.

Fragmentation of health systems—including incoherence in policy and financing—is a particular barrier to resilience in LMICs. Fragmentation occurs when many different health "sub-systems" co-exist, with each providing care for different parts of a country's population. Fragmentation is problematic, as it results in gaps in the provision of health services, with certain segments of the population—often the poorest—being left without coverage.[12] This significantly reduces the capacity of health systems to mitigate systemic shocks. For example, fragmentation has hindered the Yemeni health system from effectively responding to the ongoing humanitarian crisis in the country.[13] In particular, the fragmentation of healthcare provision between different government ministries (such as the Ministry of Defence, which provides health services to the army) has jeopardised the ability of the Ministry of Public Health and Population to implement nationwide public health programmes that might alleviate the crisis. Furthermore, a lack of co-operation between different entities with shared responsibility for public health matters—such as water or sanitation—has constrained institutional capacity to contain outbreaks of infectious diseases, such as cholera.

Inadequate or non-existent surveillance and early-warning systems also present an obstacle to the development of health system resilience in all countries, particularly LMICs. Multi sectoral, transparent and agile surveillance and response systems play a critical role in ensuring that disease outbreaks are identified early and their spread is rapidly investigated and minimised. Where deficiencies exist within these systems, the length, spread and severity of outbreaks is increased. The importance of surveillance, response and early-warning systems was

[12] Goss, P.E. et al. (2013). Planning cancer control in Latin America and the Caribbean. Lancet Oncol. 14(5): 391-436
[13] Dureab, F. et al. (2021). Forms of Health System Fragmentation During Conflict: The Case of Yemen. Front Public Health 12(9)

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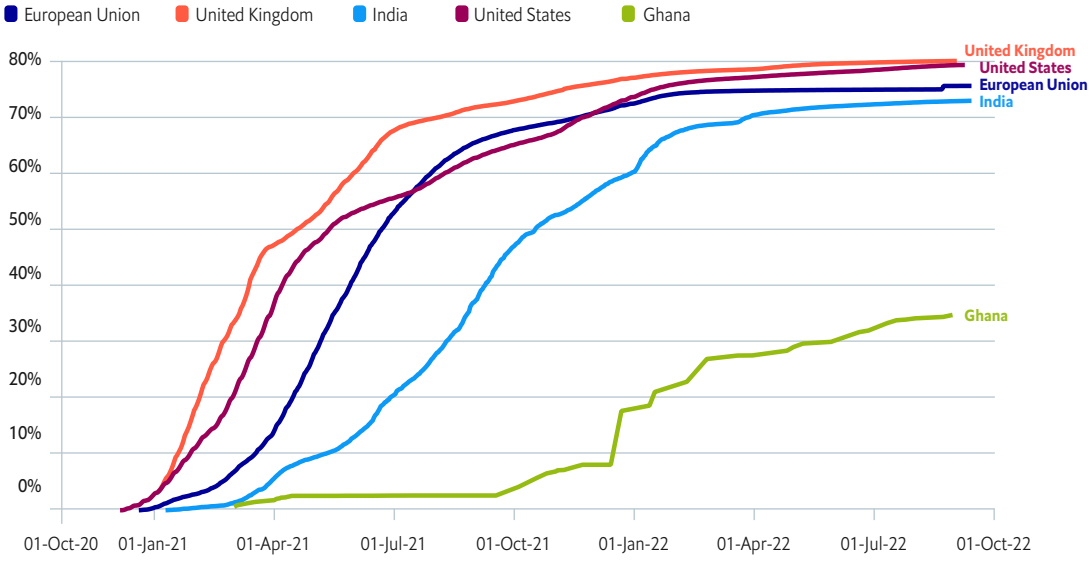
Figure 1: Percentage of people who received at least one dose of covid-19 vaccine

Total number of people who received at least one vaccine dose, divided by the total population of the country



Source: Our World In Data. These estimates are based on the total population for each country.

evidenced during the Ebola outbreak in West Africa, which began in December 2013, was first detected in March 2014 - and was declared a Public Health Emergency of International Concern in August 2014. Weak surveillance systems contributed towards difficulties in containing the outbreak, facilitating its spread across the region.[14]

A lack of progress towards universal health coverage is a longstanding challenge to health system resilience in LMICs. Although there are numerous causes of low healthcare coverage in LMICs, a particularly salient issue is chronic underinvestment in healthcare infrastructure, such as hospitals and clinics. Underinvestment in such physical facilities leaves significant portions of the population—particularly in poorer, rural areas—lacking access to essential healthcare services, including consultations and immunisations. These gaps in care consequently threaten the collective health security of the population—for example, by facilitating the emergence of infectious disease outbreaks.

A robust and effective health system is reliant on adequate supplies of medicines, medical devices, personal protective equipment and other products. Unfortunately, constrained government budgets and limited domestic manufacturing capacity mean that LMICs often struggle to maintain adequate stocks of medical supplies, presenting a major challenge to the resilience of their health systems. This is particularly evident when LMICs are forced to compete with higher-income countries for scarce supplies, as was demonstrated during the global contest for covid-19 vaccines.

The impacts of disparities in local manufacturing capacities have underscored the challenges that result from dependency on importing essential supplies. For example, while India—a country with a strong vaccine manufacturing industry—had given at least one covid-19 vaccine to 35% of its population by August 31st 2021, just 4.9% of Africans had received a vaccine by the same date.[15] Such inequities in vaccination rates risk prolonging the pandemic in countries without

[14] https://www.cdc.gov/vhf/ebola/history/2014-2016-outbreak/index.html
[15] https://ourworldindata.org/explorers/coronavirus-data-explorer?zoomToSelection=true&time=2021-08-31&facet=none&pickerSort=desc&pickerMetric=population&hideControls=true&Metric=People+vaccinated+%28by+dose%29&Interval=Cumulative&Relative+to+Population=true&Color+by+test+positivity=false&country=Africa~IND

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free access to vaccines or vaccine manufacturing capacity, exacerbating the damage done to health, social and economic outcomes. Dr Chunharas, president of the Thai National Health Foundation and former deputy minister of public health for Thailand, reiterates the importance of having adequate medical supplies noting that developing countries—such as Thailand—"have to make sure that essential supplies can be manufactured ... regionally ... if not nationally".

Access to medicines, medical devices and equipment is largely influenced by the efficiency of procurement. Ineffective procurement processes in LMICs mean that some of the poorest countries pay the highest prices globally. Purchasers in LMICs pay as much as 20 to 30 times more for basic generic medicines, relative to international minimum prices.[16] High prices restrict access to medical supplies, thus acting as a key barrier to building health system resilience. One 2017 study found that patients in Nigeria are required to purchase medicines at 2 to 64 times international reference prices.[17]

Deficiencies in the healthcare workforce constitute another key barrier to health system resilience in LMICs. Staff shortages and insufficient investment in employee wellbeing lead to burnout and reduced productivity and result in the healthcare workforce being overstretched. This inhibits health systems from being able to absorb rapid spikes in demand, as may arise during shocks like an infectious disease outbreak, extreme weather event or military conflict. Expanding on this point, Stefan Nachuk, senior advisor, health systems at the Bill & Melinda Gates Foundation, notes the issue of widespread staff absenteeism—the failure of remunerated health professionals to work as contracted—in many LMICs. This leads to significant wastage of health expenditure and limits health systems' capacity to deliver positive health outcomes. Mr Nachuk attributes absenteeism to systemic issues, including poorly provisioned facilities and low pay by the government, which incentivise physicians to seek unofficial employment in private hospitals. While this is a particular problem in India, where the average absenteeism rate for doctors and other healthcare providers is around 40%, absenteeism is a problem in a diverse array of LMICs, including Peru, Indonesia and Uganda.[18,19]

[16] https://cgdev.org/better-health-procurement
[17] https://www.afro.who.int/sites/default/files/2017-06/nigeria_medicine_prices.pdf
[18] Panagariya, Arvind. India: The Crisis in Rural Health Care. Brookings Institution, 28 July 2016, www.brookings.edu/opinions/india-the-crisis-in-rural-health-care/.
[19] Chaudhury, N. et al. (2006). Missing in action: teacher and health worker absence in developing countries. J Econ Perspect. 20(1): 91–116.

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Chapter 3: The way forward

A package of policies focused on health system governance, financing, resources, infrastructure and delivery will be needed to foster resilience in LMICs.

Given the complex barriers that exist to building health system resilience, a set of strategies is urgently needed to pave the way forward for LMICs. To this end, we present a number of policies designed to catalyse progress. While these by no means constitute a comprehensive list, they account for the most salient strategies to emerge from our literature review and interviews with experts. The strategies that we have identified for enhancing resilience are mapped onto five key health system functions: governance, financing, resources, infrastructure and delivery.

Governance

Resilience is dependent on health systems' capacity to react with agility to emerging challenges at the local level.

Health system governance—the steering and rule-making function of a health system—is essential to ensuring that health systems deliver on national health policy objectives, including those that emerge during a crisis. *"If we have proper governance, then everything else is linked to that," says Dr Bishen. "You can do other things well if you have strong governance and good financing."* Importantly, resilient governance is likely to be highly context-dependent, varying with factors like the overarching political system in a country and the level of economic development. As such, governance strategies will differ between countries of different income levels, necessitating the development of LMIC-specific policies.

In order to articulate what resilient governance looks like, Stefan Nachuk suggests that governance should be considered in two parts: good management and good politics. Good management refers to a health system's ability to execute defined plans. Good politics, on the other hand, refers to the ability of a health system to build "some sense of national awareness and solidarity," he says; it is contingent upon public unity and "a high degree of trust in public institutions."

A key component of good management is health systems' ability to mobilise and co-ordinate critical stakeholders, particularly amid a crisis. Given the complexity of a health system's response to a systemic shock, co-ordination and alignment of activities between governments and key stakeholders—including healthcare providers, the private sector, NGOs, international organisations and communities—is key. To facilitate effective inter-stakeholder co-operation, high-performing health systems during the covid-19 pandemic implemented comprehensive information sharing and co-ordination arrangements between stakeholders early on.[20] Singapore, for example, initiated near-

[20] Legido-Quigley H et al. (2020). Are high-performing health systems resilient against the covid-19 epidemic? Lancet, 395(10227):848–850.

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> **"Both of those factors—the politics and the ability to deliver on some relatively simple things, but on a massive scale, in a very consistent manner, really differentiate the winners from the losers."**
>
> Stefan Nachuk, Bill & Melinda Gates Foundation

daily meetings between Regional Health System managers, hospital leaders and the Ministry of Health. Similarly, South Africa developed cross-functional mechanisms for rapid decision-making, including surveillance "huddles" that brought outbreak response teams together with the epidemiology and surveillance team and provincial communication offices to share information across districts.[21]

Co-ordination and stakeholder mobilisation is not only important within countries—it is also vital at the international level. Global health partnerships have significant potential to convene and rapidly accelerate global solutions to systemic threats. As demonstrated by the stark regional disparities that emerged in access to covid-19 vaccines, empowering partnerships such as Gavi, the Vaccine Alliance (and co-leader of the COVAX initiative to expand covid-19 vaccine access) is crucial to increasing equitable access to global public goods.

The determinants of health reach far beyond the healthcare sector. "Health systems are nested in broader social systems [and] ill health is nested in broader social ills," says Lucy Gilson, professor of health policy and systems at London School of Hygiene & Tropical Medicine and the University of the Western Cape. "[To build resilience] we need more than healthcare—we need to create a system that offers resilience to society at large."

Tackling these broader social determinants of health, which range from access to adequate sanitation to the price of energy, requires the participation of a diversity of sectors across government and society more broadly. As such, resilience is also contingent on the extent to which health systems have embedded inter-sectoral collaboration into their governance.

Good management also includes a health system's capacity to adapt to novel contexts. This requires health systems to respond to challenges by tailoring solutions to the population's needs, rather than implementing policies haphazardly. In Dr Chunharas' experience of the Thai health service, this was contingent on two main factors: allowing sub-units of the health system to operate independently of the centre and ensuring a high degree of community participation in the health system. In Thailand, community participation is fostered through a vast network of village health communicators and volunteers (see box, "Thailand's universal healthcare model"). This network of local participants in the health system has in turn enabled peripheral subunits of the health system to respond actively and flexibly to localised challenges. This approach has enhanced Thailand's ability "to better cope with changing demand" and "mobilise people quickly", says Dr Chunharas. "It is community participation [that] has been the force that has kept the system dynamic."

[21] https://www.hst.org.za/publications/South%20African%20Health%20Reviews/Chapter16_SAHR21_04022022_OD.pdf

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Thailand's universal healthcare model

Thailand's initial response to the onset of the covid-19 pandemic in 2020 was widely lauded as a success story, including by the World Health Organisation (WHO).[22] A widely recognised strength of Thailand's health system that may have contributed to the nation's resilience during the pandemic is its universal healthcare model.

The foundations of this model were laid in 1979, when the Thai government committed to healthcare for all, with a focus on primary healthcare. To increase the reach of the health system in rural areas, the Ministry of Public Health introduced two categories of health actors—village health communicators and village health volunteers—respectively tasked with communication and health service provision. The development and training of a cadre of over 1m such volunteers—mostly women—has helped to make the Thai health system more dynamic, responsive and resilient.[23]

In 2002 the government became one of the first in a middle-income country to adopt universal healthcare, entitling almost all of the population to healthcare access ('stateless' people and individuals without documentation were not covered[24]), with significant benefits to public health and society. For example, in the subsequent decade the correlation between poverty and infant mortality disappeared, and evidence also suggests that the scheme reduced the likelihood of employees reporting as too sick to work.[25,26] Perhaps most importantly, by extending healthcare access across the population and encouraging community participation in healthcare provision, Thailand's health system has become better able to adapt to the evolving needs of the population, fostering greater resilience against future challenges.

"Whatever made the universal healthcare system adapt and evolve, is what made the Thai health system better able to cope with covid-19."

Dr Somsak Chunharas, president of the Thai National Health Foundation and former deputy minister of public health for Thailand

[22] https://news.un.org/en/story/2020/08/1069191
[23] Rajatanavin, Chunharas, Sawasdivorn, Jongudomsuk & Thammatacharee (2019). Resilient health system and UHC.
[24] Suphanchaimat, R. et al. (2016). Health insurance for people with citizenship problems in Thailand: a case study of policy implementation. Health Policy and Planning 31(2): 229–238
[25] Gruber, J. et al. (2014). The Great Equalizer: Health Care Access and Infant Mortality in Thailand. Am Econ J Appl Econ. 1;6(1): 91-107
[26] Wagstaff, A. and Manachotphong, W. (2012). The Health Effects of Universal Health Care: Evidence from Thailand. World Bank Policy Research Working Paper No. 6119, Available at SSRN: https://ssrn.com/abstract=2103016

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"We need to recognise that health systems are shaped by politics. In crisis moments, politics is a particularly strong influence."

Professor Lucy Gilson, London School of Hygiene & Tropical Medicine/University of the Western Cape

The impact of good politics on fostering resilient health systems should not be understated. "Probably the biggest difference that we've seen during the covid-19 period is the ability of national governments to actually motivate populations and change behaviour," says Mr Nachuk. "And interestingly some of the best examples in the world are not OECD countries." Mr Nachuk points to the fact that "many European and North American countries really struggled with this during the pandemic", while others—such as Vietnam—have managed to "mobilise and be disciplined around issues that are seen as national crises." According to the IMF, Vietnam's success in this regard was attributable to the use of effective, transparent messaging. This was done using a co-ordinated, multimedia approach—including mass media, public posters and campaigns by grassroots organisations—that fostered public trust and encouraged adherence to containment measures.[27] Vietnam's communications strategy should serve as an example of how to galvanise public support for public health measures during a crisis.

Financing

Effective financing—and anti-corruption measures such as transparent e-procurement systems—can help to reduce wastage of public resources and increase government savings, enabling health systems to maintain adequate stocks of medical supplies.

Effective investment and financing is key to building health system resilience—"You can tell how resilient a health system is by looking at [its] financing," says Dr Bishen. The efficient allocation of funds is particularly crucial in LMICs, where government budgets are significantly more constrained than in wealthier countries. And while the scale of financing is important, the size of a country's funds are far from the only important factor. "The size [of funds] does not matter as much as the system's ability to evolve," says Dr Chunharas. In essence, a health financing system that is very rigid will exhibit poor resilience, regardless of the volume of funds channelled into it.

[27] https://www.imf.org/en/News/Articles/2020/06/29/na062920-vietnams-success-in-containing-covid19-offers-roadmap-for-other-developing-countries

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Value-based healthcare is one strategy that may help to integrate resilience into health system financing. In a value-based system, providers are paid for patient outcomes, rather than by the activities or services they supply. Such models may incentivise activities and investments that are beneficial for both day-to-day operations and improving health systems' emergency preparedness. They may also ensure that funds are used more effectively. "Value-based healthcare should be an integral part of your investment as you develop your healthcare system," says Dr Bishen. Value-based schemes are currently still nascent in LMICs. However, there is growing interest in the potential of value-based healthcare to resolve longstanding challenges to health system performance. USAID, for instance, has invested US$8m in a three-year pilot project applying value-based care to address the tuberculosis epidemic in India.[28]

It is important to acknowledge the potential for corruption to infiltrate health system procurement, especially during times of crisis. Many countries have implemented policies to enhance transparency and integrity in procurement, to mitigate the risk of corruption. Ukraine achieved a breakthrough in this regard in 2016, when it transitioned to transparent, competitive public procurement of medicines through ProZorro, a digital e-procurement platform. As well as combating corruption, ProZorro has helped to increase competition for government tenders, reduce spending on contracting processes and ensure that suppliers are treated fairly. This has helped the government to make substantial savings—over 18% of Ukraine's planned healthcare budget was saved in the year following Prozorro's introduction.[29] The savings facilitated by increased transparency help health systems to purchase and maintain adequate stocks of medical supplies. This subsequently strengthens the resilience of health systems during spikes in demand.

"Transparency in monitoring and accountability of procurement processes is critical so that decisions being made can be tracked accordingly."

Professor Lucy Gilson, London School of Hygiene & Tropical Medicine/University of the Western Cape

[28] https://www.leapfrogtovalue.org/case-study
[29] https://en.interfax.com.ua/news/economic/343760.html

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Improvements in public financial management may also facilitate increased health system resilience, particularly in LMICs. Effective public financial management enables countries to act quickly in a crisis. Yet poor public financial management is a "massive and unknown problem" in LMICs, says Mr Nachuk. Highly centralised countries like Bangladesh, for example, "have been struggling to move cash down to the facility level for things like vaccines"—despite having the funds available. This is in part due to the existence of "powerful incentives not to make mistakes and not to be accused of corruption, but [few] incentives to disperse [funds], even if that would do something better." Flexible public financial management has had demonstrable benefits in the context of the covid-19 pandemic: countries with health budgets that release funds according to programmatic envelopes linked to policy objectives, rather than detailed line items, have tended to be able to redirect funds to emergency responses more quickly.[30] For example, provinces in South Africa were empowered to reallocate up to 1 billion South African Rand for covid-19 expenditure, enabling a more agile pandemic response.[31]

Resources

Creating surge capacity by mobilising and recruiting additional healthcare workers or volunteers can allow countries to effectively respond to changing demands in times of crisis.

The ability to accommodate sudden surges in demand is integral to health system resilience. This was evidenced during the height of the covid-19 pandemic, when even high-income nations struggled to maintain adequate supplies of essential medical equipment—such as ventilators—leading to poorer health outcomes for hospitalised patients.[32] Health systems must integrate resilience into supplies of resources, including medicines, medical equipment and the healthcare workforce.

High-quality human resources—in essence, a well-staffed, well-trained and motivated healthcare workforce—are essential to maintaining health system performance under pressure. How health systems "train, recruit, reward and deploy their workforce says a lot about health system resilience," says Dr Bishen. Similarly, Dr Chunharas emphasises the importance of the "quality of human resources in the [Thai] system"—including doctors, community health providers and village health volunteers—in fostering health system resilience in Thailand. In particular, Dr Chunharas highlights the role played by "healthcare workers in the periphery", who are integral to maintaining trust and good relationships between healthcare institutions and the public.

Staff shortages are a major challenge for the human resources of a health system. For example, in 2019 Ghana had just 1.7 physicians per 10,000 people, far lower than high-income countries like Ireland (34.9) or Israel (36.3).[33] These shortages impose severe limitations on how effectively a health system can function on a day-to-day manner, as well as in a crisis. There are multiple ways in which LMIC health systems have sought to tackle this problem. One strategy is to employ a higher proportion of nurses (who are generally cheaper to employ and more readily available than more specialised staff) to mitigate shortfalls in the number of

[30] https://p4h.world/en/blog-lessons-for-managing-public-finances-from-COVID-19-response
[31] ibid.
[32] https://www.reuters.com/article/uk-health-coronavirus-ventilators-exclus-idUKKBN2153GU
[33] Global Health Workforce Statistics, World Health Organization, Geneva. https://www.who.int/data/gho/data/themes/topics/health-workforce

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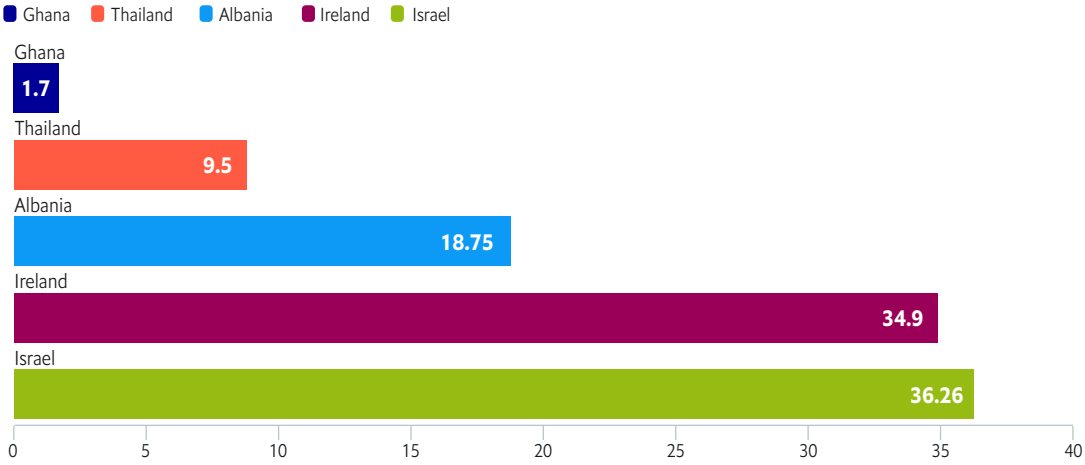
Figure 2: Physicians per 10,000 people in selected countries, 2020



Source: WHO Global Health workforce statistics database.

doctors. For example, Mr Nachuk points to the Thai health system's "low-cost, relatively high-quality approach to providing reasonable care", which relies upon a large cohort of "well-trained, low-cost technical nurses". These nurses are particularly important in rural areas, which face the greatest challenges in employing sufficient numbers of trained physicians.

To address workforce shortages during the covid-19 pandemic, a number of countries devised innovative approaches to enhance the capacity of the healthcare workforce. For example, in Bosnia and Herzegovina, medical students who were not yet in their final year of study were called upon to assist with the pandemic effort and a campaign was launched to persuade retired medical professionals to return to work.[34] By formalising plans for such arrangements in times of stability, health systems suffering from shortages in staff can better prepare for the next crisis.

As discussed in the previous chapter, high prevalence of workforce absenteeism is a significant threat to health system resilience in many LMICs. To address this issue, novel approaches such as community-based supervision have been suggested as a way to make the working environment more attractive for the healthcare workforce. Community-based supervision involves tasking the local community with monitoring the activities of health workers, as well as identifying areas where health workers may need more support. Health systems should "experiment with a range of things," says Mr Nachuk, "including recruitment from local communities, using hard and soft incentives (including allowing some degree of dual practice) and trying to create some incentives for better performance within the system."

Market inefficiencies are a significant barrier to resilience in the procurement of medical supplies in LMICs. "Medicines markets in [LMICs] are really quite broken," says Janeen Keller, senior policy analyst and assistant director of global health at the Center for Global Health Development. "There is very little competition in these markets, which essentially drives up prices for purchasers." One strategy that Ms Keller highlights as a remedy is reform of outdated regulations, quality-control processes and antiquated systems that inhibit purchasers from acquiring medical products at the optimum price. When these processes are overly burdensome, they act as a barrier to entry for manufacturers of medical products (particularly generics), resulting in lower competition and higher product prices.

[34] https://apps.who.int/iris/bitstream/handle/10665/336296/Eurohealth-26-2-51-57-eng.pdf

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In order to streamline such processes, Ms Keller notes the benefits of participation in the WHO's Collaborative Registration Procedure (CRP).[35] The CRP empowers regulatory authorities to approve medical products by relying on the assessments of stringent regulatory authorities in other jurisdictions, rather than having to undertake these assessments themselves. This reduces the time taken for products to receive approval (by an average of 40% according to the WHO's evaluation of the CRP pilot programme), and thereby facilitates the emergence of greater competition in the market.[36] Taken together, such reforms are key to developing vibrant, competitive markets for medical supplies that are better able to weather disruptions to global supply chains.

While devising strategies to maintain adequate supplies of resources during a crisis is important, it is also crucial that governments think carefully about how such resources are allocated. In particular, it is key that opportunity costs are accounted for when making decisions on whether to divert scarce resources away from everyday health services. This point is especially pertinent in LMICs, where resource shortages are generally more pronounced. Evidence from the covid-19 pandemic suggests that the indirect effects of a health system's response to an infectious disease outbreak can be just as damaging—or even worse—than the direct toll of the disease itself. For example, in 2020 the Measles and Rubella Initiative reported that more than 117m children would miss out on measles vaccinations as a result of coronavirus-induced cancellations of routine vaccination campaigns, posing an enormous threat to future public health.[37] Decision-makers must carefully consider the consequences of diverting resources away from key priority areas for health in LMICs—including HIV/AIDS, tuberculosis and malaria—when devising strategies for how to allocate resources during a crisis.

Physical Infrastructure

The distribution, location and design of physical healthcare facilities will play an increasingly important role in determining health system resilience, given the rising frequency of climate change-related natural disasters.

Adequate infrastructure is critical to supporting a health system's response to shocks and chronic threats. In particular, integrating resilience into physical infrastructure—for example by ensuring that facilities are protected against climate change—will play an increasingly important role.

Physical facilities—from local community clinics to large district hospitals—are where the majority of healthcare services are provided. As

[35] https://www.who.int/news/item/15-02-2022-who-collaborative-registration-procedure-using-stringent-regulatory-authorities-medicine-evaluation-reliance-in-action
[36] Vaz, A. et al. (2022). WHO collaborative registration procedure using stringent regulatory authorities' medicine evaluation: reliance in action? Expert Review of Clinical Pharmacology 15(1): 11-17
[37] https://www.thenewhumanitarian.org/news/2020/04/14/coronavirus-measles-vaccination

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such, their distribution, location and design are integral to the ability of a health system to cope in a crisis. Ensuring widespread access to basic healthcare through a dispersed network of basic health facilities is vital. "The key thing is not large, fancy hospitals, [because] what you really are trying to do [in a crisis] is mitigate and lower caseloads," says Mr Nachuk. "For that you require a large number of facilities relatively close to the population." In line with this philosophy, in May 2022 the Indonesian minister of health, Budi Gunadi Sadikin, proposed establishing 300,000 health posts across the country—equivalent to one health post for every 900 Indonesians.[38] These will seek to boost Indonesia's child immunisation drive—a critical factor to safeguarding the country's health system against future infectious disease outbreaks.

Effective surveillance infrastructure plays an essential role in supporting health system resilience by enabling the timely detection and control of potential high-risk events. Colombia's Public Health Emergency Operations Centre —the first of its kind in South America—has received international recognition for its role in controlling the spread of measles among the thousands of Venezuelan refugees who arrived in Colombia in 2018.[39]

Looking to the future, there is an increasing need to integrate surveillance infrastructure with information systems from other sectors.[40] For example, given the increasing role that extreme weather events such as droughts and floods will play in influencing population health, health surveillance infrastructure could benefit by incorporating data from weather forecasting systems.

"In countries like Bangladesh, location matters … You are going to want to build infrastructure in such a manner where you have high ceilings and ventilation, given heat stresses—because you aren't going to have air conditioning in these places— and you are going to want to build on high ground, because flooding will become a bigger issue in the future."

Stefan Nachuk, Bill & Melinda Gates Foundation

[38] https://indonesiaseharusnya-bali.com/govt-reactivates-300000-health-services-posts-to-improve-healthcare-services-for-mothers-children/
[39] https://www.cdc.gov/globalhealth/healthprotection/fieldupdates/spring-2019/Colombia-nphi-preparedness.html
[40] Hanefeld J et al. (2018). Towards an understanding of resilience: Responding to health systems shocks. Health Policy and Planning, 33(3):355–367.

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Finally, in the context of defending against future outbreaks of infectious disease, testing infrastructure plays a critical role in supporting resilience. In particular, effective testing infrastructure is contingent on the existence of a comprehensive network of national labs that are prepared to test high volumes of samples at a rapid rate. *"Labs were part of the unsung hero of this pandemic," says Mr Nachuk—successful countries have been those that "had basic, good lab facilities where they can ... turn around really, really fast tests."* For a country of its income group and level of development, Senegal stands out as a success story in this regard, having managed to rapidly set up field labs in each region of the country with capacity to process tests within 48 hours or less.[41]

Delivery

Investment in preventive care—such as vaccination campaigns—can reduce pressures on healthcare systems and substantially improve health outcomes. Community health workers play an important role in delivering preventive care in many LMICs.

In times of crisis, health systems may need to adopt alternative methods of healthcare provision, as was evidenced by the covid-19 pandemic. The capacity to adopt and scale-up flexible approaches for delivering care is therefore critical to determining how health systems cope with unexpected shocks.

Many countries implemented innovative methods of service delivery during the covid-19 pandemic, including the use of telemedicine and virtual care. Telemedicine can help to reduce the spread of infectious diseases by limiting in-person contact between patients and healthcare providers. It also has the potential to increase the efficiency of health service delivery by enabling doctors to carry out more appointments per day, at a lower cost per appointment.[42] Furthermore, telemedicine may help to broaden access to healthcare by allowing specialised physicians to reach rural communities (see insert: "Unlocking innovation in healthcare").

These impacts alleviate pressure on overburdened health systems during spikes in demand, thereby boosting resilience in times of crisis. For example, widespread uptake of telemedicine in Lebanon during the pandemic was accompanied by a positive shift in physicians' perceptions of telehealth, indicating greater confidence in its potential.[43] However, it is important to consider contextual factors that hinder the realisation of telemedicine's potential in other LMICs, including limited supporting infrastructure (such as reliable internet connections). While telemedicine holds the potential to improve access to healthcare and bolster resilience in LMICs, the uptake of digital technology should not supplant investment in traditional components of the health system, including the healthcare workforce and physical infrastructure. "[Information technology] can be a massive enabler, but it cannot be a substitute," says Mr Nachuk.

Health systems can also build resilience outside the context of a crisis. By emphasising the delivery of preventive care during times of stability, health systems can proactively tackle emerging challenges before they threaten

[41] https://www.vox.com/22397842/senegal-covid-19-pandemic-playbook
[42] Mahmoud, K. et al. (2022). Telemedicine in Low- and Middle-Income Countries During the covid-19 Pandemic: A Scoping Review. Front Public Health. 22(10): 914423.
[43] Helou, S. et al. (2020). The effect of the covid-19 pandemic on physicians' use and perception of telehealth: the case of Lebanon. Int J Environ Res Public Health. 17:4866.

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to overwhelm the system. "Investment in preventative care [is] important," because it results in "less pressure on hospital care," says Dr Bishen. "It is extremely important that you [not only] look at the response to something, but you [also] build preventative care, so that you are proactive." This is particularly important, given the increasing burden of NCDs in LMICs.

Unlocking innovation in healthcare

Health systems' adoption of digital technologies has undergone a marked acceleration since the onset of the pandemic. A number of African countries have embraced the potential of digital innovation to enhance the effectiveness and resilience of health systems in the face of systemic threats.

Nigeria's Surveillance Outbreak Response Management and Analysis System (SORMAS) is an open-source, digital early-warning and disease-management system, first developed during the Ebola outbreak.[44] Available via desktop, tablet and mobile-phone applications, SORMAS allows individual healthcare workers and surveillance officers to upload data on suspected cases of infectious disease. By connecting informants on the ground with epidemiologists, health officials and policymakers in real time, SORMAS allows for rapid and targeted responses to potential infectious outbreaks.

Although SORMAS was initially designed to track the incidence of Ebola, its modular design means that it is able to adapt to novel infectious diseases quickly. In fact, a covid-19 module had already been incorporated in February 2020, before Nigeria had registered its first confirmed case of the virus. Although there has not yet been a formal evaluation of SORMAS' role in supporting Nigeria's covid-19 response, stakeholders in Nigeria have praised its utility in rapidly identifying case clusters, facilitating contact tracing and reducing reliance on paper-based forms.[45] In fact, the perceived impacts of SORMAS in fostering resilience have led to its rollout in a variety of other LMICs, including Ghana and Fiji, as well as high-income countries such as France and Germany.

Given the scale of the challenges faced by many African countries, the scope for private-sector involvement in fostering innovative solutions is considerable. In 2016 Zipline, an American logistics company, began supplying rural communities in Rwanda with lifesaving medicines via remotely operated drones.[46] By 2019 the service had expanded nationwide, delivering 75% of the nation's supply of blood outside of the capital, Kigali.[47]

Following the onset of the covid-19 pandemic, Zipline has expanded its operations to Ghana, establishing four distribution centres with the capacity to serve 12m people. By enabling healthcare workers to place orders for medical supplies via app, with delivery within 30 minutes, Zipline's drone network has enabled rapid local responses to shortages in medicines, vaccines and equipment. Zipline succeeded in distributing over 1m doses of vaccines in Ghana in 2020, demonstrating the potential for drones to foster resilience and strengthen public health across other LMICs.[48]

[44] https://www.exemplars.health/emerging-topics/epidemic-preparedness-and-response/digital-health-tools/sormas-nigeria
[45] Ibid.
[46] https://borgenproject.org/tag/zipline-in-ghana/
[47] https://www3.weforum.org/docs/WEF_Medicine_from_the_Sky_2021.pdf
[48] ibid.

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Rwanda has recognised the value of preventive care in building long-term health system resilience, as demonstrated through its drive to eliminate human papillomavirus (HPV), a virus that can cause cervical cancer (currently the most common cancer among Rwandan women). The country has implemented an HPV vaccination programme that has achieved broader coverage than in wealthy counterparts like the UK.[49] Thanks to the efforts of a network of community health workers who have spearheaded the vaccination campaign, Rwanda has now established itself as a frontrunner in the race to eliminate the disease. Community health workers play a vital role in delivering preventive care in LMICs and are a key asset to health systems, given their community-rooted credibility and understanding.

"[Community health workers] have a huge role to play…[LMICs] have more of a structure of these community health workers that can work closely with GPs and populations and have that trust. That trust is fundamental, specifically in the context of a pandemic."

Francesca Colombo, OECD

[49] https://www.theguardian.com/global-development/2022/aug/18/how-rwanda-could-become-one-of-the-first-countries-to-wipe-out-cervical-cancer-acc

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Conclusion

It is clear that all countries need to ensure that their health systems are better prepared to deal with future shocks and challenges. A recurring theme in our interviews with experts was the warning that the covid-19 pandemic will not be the last challenge to threaten the resilience of health systems. From climate change to economic shocks, the challenges that health systems are due to face are multifaceted and complex and thereby warrant careful consideration in today's evolving context.

There are many lessons that countries can draw on from previous crises that can be used to inform strategies for building resilience. As the examples in our report demonstrate, a health system's capacity to effectively adapt to changing population needs and contexts will play an important role in improving health outcomes and preparing for future challenges. Digital technology can also play an important role in increasing healthcare access and reducing costs to patients, when complemented with the necessary workforce and infrastructure.

The role of effective governance in building a resilient health system cannot be understated. Looking ahead, governments will need to carefully consider how to strike a balance between investing and allocating resources towards crisis preparedness and response, while simultaneously accounting for the resources needed to maintain the delivery of day-to-day essential health services.

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