Building Resilient Health Systems: A Proposal for a Resilience Index

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Accessibility
Building resilient health systems: a proposal for a resilience index

Health system resilience begins with measurement of critical capacities ahead of crisis say Margaret E Kruk and colleagues

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The 2014 west African Ebola epidemic shone a harsh light on the health systems of Guinea, Liberia, and Sierra Leone. While decades of domestic and international investment had contributed to substantial progress on the Millennium Development Goals, national health systems remained weak and were unable to cope with the epidemic. Routine care of the population also deteriorated during the outbreak. Surveillance systems did not function effectively, allowing Ebola to spread within and between the countries. Global institutions were slow to respond to the crisis, squandering an opportunity to stem its course.

Since then, diverse panels of experts have pointed to political and technical deficiencies in multilateral organisations in tackling health crises. These reports have noted that the first line of defence against future pandemics is an effective national health system. They have also called for better measurement of public health capacity, and investment to build resilient health systems—systems that can withstand health shocks while maintaining routine functions. The issue of how global bodies can support countries in withstanding future health shocks is playing out now in the election of the new director general of WHO, with several candidates making health system resilience part of their election planks.

Based on recent literature, this paper defines health system resilience as “the capacity of health actors, institutions, and populations to prepare for and effectively respond to crises; maintain core functions when a crisis hits; and, informed by lessons learnt during the crisis, reorganise if conditions require it.” Health system resilience is relevant in all countries facing health shocks—whether sudden (Ebola, earthquakes, terror attacks, refugees), slower moving (new pathogens such as Zika becoming endemic or epidemiologic transition), or the more chronic stresses that characterise even times that seem calm (drug shortages, loss of key health personnel, smaller outbreaks of endemic diseases). Yet, while health system resilience has been defined and widely discussed, there is debate about whether the concept has anything new to add to discussions on health system strengthening, and how resilience can best be built and measured.

As shown in figure 1, resilient health systems are aware, integrated, diverse, self regulating, and adaptive. These features do not arise in a vacuum: they require a foundation of strong local and national leadership, a committed health workforce, sufficient infrastructure, and global support. The last point is especially worth emphasising: resilience is not self sufficiency. Crises do not respect geopolitical boundaries and so resilience requires thoughtful interconnectedness or “smart dependency.”

In this paper, we argue that the concept of resilience adds substantial value to the health systems discourse, and we propose measures of health system resilience.
Exploring the concept of resilient health systems

While the construct of resilience has been widely used in diverse fields, including ecology, engineering, and psychology, it is relatively new to health. With a plethora of frameworks and catchphrases crowding the global health lexicon, there are legitimate questions about the value added by the concept. We identify three contributions of the concept of resilience to the health systems field.

First, resilience emphasises the functions health systems need (figure 1) to respond and adapt to health shocks, introducing a dynamic dimension into more static health system models which can help the system cope with surges in demand and adapt to changing epidemiology and population expectations of care. A rigidity of mission characterises the operations of many countries’ health systems, whose ethos and organisation is better suited to yesterday’s disease burden than tomorrow’s, focusing mostly on basic, episodic care, unequipped to provide advanced care for infections, longitudinal care for a broad spectrum of chronic diseases, or emergency care needed to respond to the rising tide of injuries.

Second, the concept contributes useful new ideas to health systems from other sectors. Solutions for supply chains and logistics to respond to surges in demand from other fields may be relevant. Building trust and promoting meaningful community engagement have been studied in other fields, such as environmental sustainability and political science, but have not been well operationalised in health systems science. Resilience draws on complex systems notions identified as important in health systems but rarely acted upon, such as the interconnectedness of health and non-health actors and the importance of feedback loops.

Finally, the concept of resilience helps bridge disparate health and development agendas—such as universal health coverage, the Global Health Security Agenda, and the Sustainable Development Goals—lending fresh impetus to the need to invest in health systems. It identifies the immediate and longer term payoffs of well functioning, responsive, and adaptable health systems and highlights the unacceptable costs of inaction. By containing outbreaks, returning to baseline function faster, and mitigating other shocks, resilient health systems can contribute to economic stability. The recognition that health systems are the front line for dealing with the next big threat to global health security amplifies the urgency of strengthening them and draws in new actors and ideas.

The increasing attention to resilience in global health has, however, prompted criticisms of the concept. One is that it is imposed, technocratic solution that obscures the socioeconomic and political factors that lead to inadequate responses to shocks. These factors may include unfavourable trade terms, weak citizen engagement, and chronic health system deficiencies. There are also worries about short term timeframes for action when problems are multifactorial, and a paradoxical push for national self reliance when threats readily cross borders.

While these concerns highlight the potential for resilience to be used as shorthand for a narrow preparedness agenda, they do not accurately represent the meaning of health system resilience as intended here. Building resilience is much more than preparedness; it involves investment in institutions, preconditions (like an effective workforce) and other “slow variables.” Communities should not have to shoulder crises alone; instead meaningful government engagement is needed to ensure responsive health services that people trust and want to use. Imposed technocratic solutions will not bring about needed change, and the particular arrangements needed to promote resilience have to emerge from the country’s context. Value judgments about what constitutes resilience for whom should be made explicit. Ordinary people may lack the power to shape the health system response or hold it to account; the process of building resilience should foster that power. Building resilience should be integrated with existing efforts to strengthen health systems and its success should be judged on equitable health gains rather than the security of wealthy nations.

Resilience in action

We present three case studies, in which several of the authors were involved, where a range of large health shocks contributed to improved health system resilience: chronic system dysfunction aggravated by a population influx in Lebanon; sudden and severe infectious disease outbreak in Liberia; and repeated, anticipated disaster shocks in Indonesia.

Awareness is the capacity to detect and interpret local warning signs and quickly call for support. Liberia’s initial paralysis during the Ebola epidemic was partly caused by poor understanding, at all levels, of the disease severity. Self regulation is the ability to isolate threats and maintain core functions under stress. While Ebola treatment units are a classic example of self regulation (in Liberia’s case, these came too late to mitigate spread), Lebanon’s emergency vaccination and surveillance efforts, and Indonesia’s regional crisis mitigation centres can also be seen as homeostatic innovations for containing health threats.

Indonesia’s case also shows the value of learning and adaptation: in anticipation of future catastrophic weather events crisis mitigation centres were instituted after the country experienced poor coordination after tsunamis. In each of these case studies, most elements of resilience emerged after a crisis rather than ahead of it. As we note below, future research should consider how the elements of resilience perform when adopted before the event.

The value of having diverse healthcare providers that can coordinate with each other is seen in the case of Lebanon, which is now hosting 1.8 million refugees from Syria, increasing its population by over 30%. To meet the challenge of much larger numbers of people seeking care, the ministry of health has expanded primary care to tackle the multiple health needs of both refugees and citizens. This has been done in part through consultation and contracting with private sector providers, including faith based providers; an example of integration among diverse health actors who in the past may not have worked together.

Integration also draws attention to the key mediating role that broader state-society relations play during crises, including the recognition of people as producers of their health and thus as co-architects of an effective crisis response. Involving people and communities in crafting a response depends on—and is a potential means of—strengthening government accountability to its citizens. Stronger mechanisms for state-society partnerships allow government officials to weave the experience, expectations and capabilities of affected people into the containment strategy for a more powerful and empathetic response. Identifying ways to work effectively with local leaders was a critical lesson from Liberia during the recent Ebola epidemic. Community leaders were critical in case finding, community mobilisation, and other epidemic control measures.
Measuring resilience capacity: the resilience index

Recent international panels reviewing the Ebola response have called for measurement of health system resilience capacity ahead of crises. Building on the conceptual framework described in figure 1, we have outlined a set of preliminary measures of national health system resilience (table 1). They include existing health system and preparedness metrics (from the International Health Regulations, the Global Health Security Agenda, and the Sustainable Development Goals), relevant measures from non-health fields, and new proposed measures that need further development and testing. This proposed resilience index balances slow (availability of district health staff with public health training, for example) and fast (such as provisions to reallocate money in emergencies) drivers of resilience. In contrast to traditional health security frameworks, many of our indicators reflect characteristics of “everyday” resilience; they not only encourage daily function but also proactively reduce the likelihood of rising system threats. The index can thus inform development of national health plans. It can also expose gaps in function and measurement capacity where regional and global cooperation can contribute. The index does not prescribe national benchmarks. Given the heterogeneity of health systems and national contexts, benchmarks for resilience indicators should be set within countries to accommodate the local context. The next step would be to review and extend this list as needed, and to develop indicators for the new measure constructs, with input from community leaders and non-health sector actors. While the index is meant to be prospective (used in advance of a crisis), some proposed measures include routinely collected service delivery and quality indicators that over time can indicate the “slope” of resilience (the extent and speed with which a system returns to...
baseline or better after a shock). The validity of the resilience index should be tested against actual performance during recent health shocks in several settings.

Conclusion

Before the failure of health systems during the Ebola outbreak is forgotten, we need to consider how to make them more resistant to crises and more flexible in their response. The concept of resilience adds dynamism and urgency to the longstanding work of health system strengthening and gives an opportunity to learn from other sectors. Country experiences as varied as Lebanon, Liberia, and Indonesia demonstrate how resilience can be built after health crises. Proposed measures of health system resilience can improve our assessment of countries’ progress in building resilience and indicate areas for action. We hope implementation of these ideas can energize policymakers and ultimately benefit families and communities in times of crisis and beyond.

Acknowledgments: This paper stemmed from discussions at The Rockefeller Foundation’s Bellagio Center. We are grateful to The Rockefeller Foundation for supporting the meeting and related research on resilience. The views expressed here are the responsibility of the authors and may not reflect the views of the foundation.

Author contributions: M.E.K conceived the idea and structure of this paper and wrote the first draft with assistance from E.J.L. All authors contributed intellectual content, edited the manuscript, and approved the final version for submission.

Not commissioned; externally peer reviewed

Competing interests: Fred Martinou has had a grant from the Wellcome Trust

**Key messages:**

- National health systems are the first line of defence against health crises.
- Health systems today are rigid and slow to adapt; they must become more resilient to effectively respond to crises and maintain core services.
- Resilience requires planning and investment in slow variables (for instance, health workers, managers, information systems) and fast variables (such as isolation wards, protective equipment, surveillance). It requires methodical building of collaboration and trust with communities ahead of crisis.
- The resilience index proposed here is designed to help countries assess whether their health systems can withstand future shocks; it should be tested in countries at high risk of health shocks.

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61 Health Minister Regulation on Regionalization of Centre for Post-Disaster Health Crisis Mitigation. No 763 Government of Indonesia, 2006.

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Table 1 | Resilience index

<table>
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<th>Characteristics*</th>
<th>Aims</th>
<th>Measures</th>
<th>Rationale</th>
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</thead>
<tbody>
<tr>
<td><strong>Aware</strong></td>
<td>Know health system capacity</td>
<td>1 Distribution of health system assets and weaknesses&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Real time geo-registry of HWs, supplies, and facilities (including NGOs and private operations) can realistically gauge available national capacities</td>
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<td>2 Health service utilisation trends</td>
<td></td>
<td>Routine health monitoring helps system detect service fluctuations and accurate assessments of crisis impact, and rate of return to baseline after a shock</td>
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<tr>
<td><strong>Know risks and population</strong></td>
<td>3 Presence of active epidemiologic surveillance system&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Routine surveillance is necessary to detect disease threats and trigger mitigation mechanisms</td>
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<td>4 Functioning civil registration and vital statistics system</td>
<td>Basic knowledge of population demographics is important for estimating health threats and trends, and understand crisis impact</td>
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<tr>
<td><strong>Communicate</strong></td>
<td>5 List of decision makers in key sectors&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Point persons across sectors must be immediately accessible for communication, decision making, and sounding alarms</td>
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<tr>
<td>6 Breadth of functioning communication channels&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Communities must be able to notify and sound alarms—this requires an environment of free speech and freedom of press, and functioning, open platforms for timely communication (hotlines, community committees, social media)</td>
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<td><strong>Diverse</strong></td>
<td>Effectively respond to range of health needs</td>
<td>7 Scope of health services available in primary care&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Including services that respond to population health needs and expectations in basic primary care package will promote routine health system utilisation and confidence in the health system</td>
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<tr>
<td>8 Quality of care for sentinel conditions in basic package&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Health outcomes, healthcare utilisation during crisis, and trust in health authorities require competent and respectful care</td>
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<tr>
<td><strong>Adequately finance health systems; prevent financial harm</strong></td>
<td>9 Financing of healthcare: adequacy of government health expenditure and financial protection&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Total health system funding must be sufficient to support functioning services; financing systems should aim to reduce catastrophic and impoverishing health spending&lt;sup&gt;b,c&lt;/sup&gt;</td>
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<td><strong>Self regulating</strong></td>
<td>Isolate threat and maintain core function</td>
<td>10 Memorandums of understanding with non-state providers</td>
<td>Establishing agreement about roles for private providers—not for profit and for profit—in crisis expands service provision in emergencies and may promote collaboration in times of calm</td>
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<tr>
<td>11 Database of service delivery alternatives for affected and unaffected populations&lt;sup&gt;a&lt;/sup&gt;</td>
<td>A routinely updated global, open access library of service delivery models tested and deemed effective in past crises promotes inter-country learning and lowers redundant reinvention and perpetuation of failed ideas</td>
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<tr>
<td><strong>Leverage outside capacity</strong></td>
<td>12 Collaboration agreements with regional and global actors</td>
<td>Agreements on nature of collaboration (timing, type of support, roles or responsibilities) during emergencies is a form of smart dependency and contributes to a faster, more effective response&lt;sup&gt;b&lt;/sup&gt;</td>
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<tr>
<td><strong>Integrated</strong></td>
<td>Coordinate with non-health actors (education, transport, police, media, private enterprise)</td>
<td>13 Existence of a national emergency coordination system and leaders&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Ready coordination systems encourages fast decision making and implementation, curbing potential effects of emergencies</td>
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<td>14 Frequency of joint planning sessions and drills&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Rehearsal of preparedness plans and regular collaboration establishes norms of intersectoral teamwork</td>
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<td>15 Process for development of a One Health strategy&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Acknowledging human ties to the environment and other species encourages an inclusive understanding of public health vulnerabilities</td>
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<td><strong>Engage citizens and communities to build trust</strong></td>
<td>16 Index of Ministry of Health and government responsiveness to community need</td>
<td>Quick action in responding to community needs can foster trust and promote containment of health shock</td>
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<td>17 Population trust in health system</td>
<td>Trust in government and the health system is essential to effective service delivery and for acceptance of government messages in crises—this is true in government run and mixed provider health systems&lt;sup&gt;d,e&lt;/sup&gt;</td>
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<td>18 Platforms for dialogue with community leaders</td>
<td>Regular input about health system functioning from citizens will improve responsiveness to community need</td>
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<td>19 In-country social scientists with experience working with health departments</td>
<td>Tapping experts in sociology, anthropology, and related disciplines strengthens understanding of key social structures in crisis response, local health determinants and the local appropriateness and acceptability of interventions</td>
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<td><strong>Link healthcare provision to public health</strong></td>
<td>20 Availability of district health staff with public health training&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Public health staff serve to promote public health practices and act as sentinels for potential outbreaks connecting local clinics to surveillance and monitoring system</td>
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<td><strong>Coordinate primary and referral care</strong></td>
<td>21 Agreement on roles and referral protocols for facilities</td>
<td>Defined agreements on the role of primary and referral facilities reduces confusion and service delay, and streamlines service delivery for patients</td>
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<td><strong>Adaptive</strong></td>
<td>Shift resources to meet need</td>
<td>22 Formal provisions to reallocate funds in emergency</td>
<td>Flexible spending of funds—national and international—speeds up and better targets emergency response in fast changing situations</td>
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<sup>a</sup> This is a generalised list and should be supplemented with more specific and context-relevant measures.  
<sup>b</sup> For successful crisis management, it is crucial to have a robust system for communicating with communities, ensuring that information is disseminated accurately and timely.  
<sup>c</sup> This measure involves developing partnerships with other sectors such as education, transport, police, and media to ensure a coordinated response.  
<sup>d</sup> The existence of a national emergency coordination system is crucial for effective crisis management.  
<sup>e</sup> Regular joint planning sessions and drills are essential for preparing and training health workers and other stakeholders for potential crises.  
<sup>f</sup> These measures aim to build trust and cooperation among citizens and health workers during crises.
Table 1 (continued)

<table>
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<tr>
<td></td>
<td>Promote rapid local decision making</td>
<td>23 Management capacity of district or local health teams&lt;sup&gt;c&lt;/sup&gt;</td>
<td>For decentralised responses, local health teams must be able to interpret local data and local leaders must be able to make quick and sound operational decisions</td>
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<td></td>
<td>24 Agreements on delegation of authority and funding in crises</td>
<td>Pre-crisis agreements permitting local decision making in crisis with sufficient support hasten response time to evolving challenges</td>
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<td>Evaluate to improve</td>
<td>25 Mechanisms for, and capacity to, track progress and evaluate health system performance in crisis and in times of calm&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Rigorous monitoring during crisis and independent evaluation post-crisis permits course correction and points to needed reforms. National capacity for data use and, more broadly, a culture of open inquiry and evaluation needs to be built in times of calm to deliver during a crisis</td>
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</table>

*Characteristics are interrelated and interdependent. Decision making and coordination should occur across these characteristics a, b, c indicate concepts similar to proposed International Health Regulation, Global Health Security Agenda, and sustainable development goals, respectively.

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BMJ 2017;357:j2323 doi: 10.1136/bmj.j2323 (Published 2017 May 23)
Figure 1 Resilient health system framework}^{12}