Resilience in public health: precepts, concepts, challenges, and perspectives

Resiliência em saúde pública: preceitos, conceitos, desafios e perspectivas

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ABSTRACT In a health system, resilience is manifested in the ability to adapt to demands or to adverse and disruptive events, such as epidemics and/or disasters, adjusting its functioning to stressful situations, before, during or after these exceptional disturbances, while maintaining the functioning and quality of assistance, thus preserving its regular activities and properties. In this essay, we present some concepts about resilience in complex systems and their applications in health systems and organizations, involving the resilience of individuals, teams, and organizations. Challenges and perspectives for improving the resilient behavior of the Brazilian Unified Health System (SUS) are also highlighted, a topic that has gained enormous attention in the COVID-19 pandemic. We conclude by emphasizing the need for more research on the various topics involving resilience in healthcare to strengthen the capacity of the SUS to cope with both daily challenges and future health crises.

KEYWORDS Outcome assessment, health care. Surge capacity. Quality of health care.

RESUMO *Em sistemas de saúde, a resiliência se manifesta na capacidade de se adaptar às demandas ou aos eventos adversos e disruptivos, como epidemias e/ou desastres, ajustando o seu funcionamento a situações de estresse, antes, durante ou depois dessas perturbações excepcionais, enquanto mantém o funcionamento e a qualidade da assistência, preservando, assim, as suas atividades e propriedades regulares. Neste ensaio, apresentam-se alguns conceitos sobre a resiliência em sistemas complexos e exemplos de suas aplicações em sistemas e organizações de saúde, envolvendo a resiliência dos indivíduos, equipes e organizações. Destacam-se também desafios e perspectivas para o desempenho resiliente do Sistema Único de Saúde (SUS), que ganhou enorme atenção na pandemia da Covid-19. Conclui-se ressaltando a necessidade de mais pesquisas sobre diversos temas envolvendo a resiliência em saúde para fortalecer a capacidade do SUS para enfrentar os desafios cotidianos e futuras crises sanitárias.*

PALAVRAS-CHAVE *Avaliação de resultados em cuidados de saúde. Capacidade de resposta ante emergências. Qualidade da assistência à saúde.*

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Introduction

The resilience of health systems is the ability to adapt that they must develop on a daily basis to adequately respond to the sudden increase in pressure of demand caused by extraordinary events (such as epidemics and other disasters that directly or indirectly affect the health of the population), while maintaining the operation, security, quality and availability of services. Therefore, resilience is a skill that must be continuously developed, and not just when crises occur, especially in the case of public systems such as the Unified Health System (SUS).

There is a certain ambiguity in the use of the term 'resilience', mainly when adopting it to characterize organizations, not people. In general, it is used to designate the ability to adapt to an unexpected event and return to normal when it ends[1]. With similar meanings, the term was appropriated by several areas of knowledge, from physics to psychology. However, a more comprehensive approach is needed to understand resilience as a capability of complex organizations such as health systems.

The SUS has the mission of equitably and comprehensively assisting the entire population of Brazil, a diverse country of continental dimensions, marked by historical social and regional disparities, with vast vulnerable territories that are difficult to access. In this scenario, the SUS' ability to act is constantly put to the test, requiring all components of the system to behave resiliently, to deal with both extraordinary events and everyday stress.

Thus, this concept of everyday resilience, applied in the field of collective health, provides a theoretical perspective for understanding the aspects that strengthen the institutional capacity of public health systems. First, by bringing the focus on how the various entities that make up health systems need to deal with, respond to and adjust to stress, challenges or demands according to their capabilities. Second, allowing the incorporation of new ideas, since resilience derives from diverse epistemic domains, such as safety engineering, psychology, disaster management, among others[2-4]. Furthermore, this concept of resilience provides a bridge between different strategies and agendas, at different levels and contexts, favoring approaches that take into account the complexity of the functioning of public health systems[4-6].

In this essay, recent literature is explored and some fundamentals, conceptual frameworks and perspectives on resilience are discussed as an aspect for the good performance of health systems.

Epistemic reflections on health resilience

The dissemination of the concept of resilience in the field of health is quite incipient. Hollnagel[7(19)] states in the preface of his book 'Resilient Health Care' that "probably only a few [scholars] know for sure what [health resilience] means". In addition, research on health resilience has still mostly focused on responding to disasters and health crises, such as epidemics and natural catastrophes[8]. However, the importance of resilience for daily health activities is gradually gaining more attention[2,9-11].

Considering that systems are made up of their elements and interactions, and that there are models, principles and laws that can be applied to systems in general, regardless of their type or the nature of their elements[12], resilience can manifest itself essentially in two ways: a) as an emergent property of the functioning of the system, which emerges from a series of skills employed in its operation; b) through the components and resources of the system, which serve to describe its strength, robustness, preparedness and adaptation strategies. These components, although

not determinants of resilient behavior per se, support the potential of health systems to react to the shocks to which they are subjected, regularly or extraordinarily.

These two forms are not, however, paradoxical. On the contrary, they are related, insofar as the behavior of systems depends on their composition as much as their composition must be operated in favor of resilience. This is important because as a system's capacity to deal with endogenous situations of chronic stress strengthens, so does its functioning in the face of sudden exogenous disturbances.

In this sense, Hartwig et al.[13] state that, in order to manifest a resilient behavior, individuals, teams and health organizations need to be fully articulated. At the individual (micro) level, Murdem et al.[14] highlight characteristics such as personality, self-esteem, positive affect, self-awareness, flexibility and self-monitoring as factors that promote resilient behavior. As a way to enhance these characteristics in workers, health organizations can develop continuing education actions focused on problem solving, promoting reflective capacity, behavioral training, improving the quality of life at work, among others. These actions, which reinforce the importance of individual well-being for the development of organizational resilience, are much explored in the fields of ergonomics and human factors[15-17].

At the level of interprofessional health teams (meso), the collaboration capacity of its members to manage extraordinary situations is a preponderant factor in the resilience of services. In this way, inadequate or insufficient collaboration within the team can have serious consequences, such as loss of life. In addition, typical attributes of effective teams, such as trust, social support, quality of relationships between members, collaborative leadership and cohesion, have a significant impact on the resilience of health systems[18,19].

Finally, in the organizational (macro) aspect, the health system's ability to respond effectively to demands and stressors (including natural disasters and large-scale emergencies) is directly related to maintaining the quality of care[4]. In the following subsections, these two forms of manifestation of resilience in health will be explored, including the analytical frameworks most adopted in both cases.

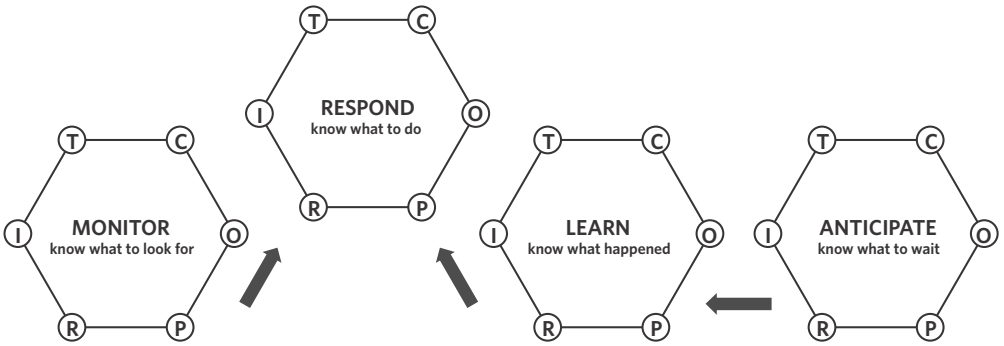
Resilience as an emergent property of health systems

Kruk et al.[3] point out that the design of resilient health systems must emphasize the functions of the system, and not just its structure. These authors also point out that the search for resilience helps in the development of institutional capacity, allowing the identification of immediate and long-term demands.

Hollnagel[20,21] goes further. More precisely, the author relates the resilience of health systems to a higher level of institutional security, or Safety-II[22], in which systems must be able to operate normally and mitigate the risks of disasters under variable conditions. To this end, it suggests the promotion of four skills: anticipation, monitoring, response and learning. These organizational skills have been adopted in the literature to operationalize resilience both qualitatively[15,23,24] and quantitatively[5,20], including in the health field, from the perspective of patient safety, for example[25,26].

Hollnagel's proposal is that, in order to adequately respond to demands, both those resulting from disruptive events and those considered normal, it is necessary to leverage the system's abilities to know what to expect, what to look for, and learn from what happened, as seen in *figure 1*. Such skills can be organized as system functions that, in turn, exert mutual influence (or resonance). Hollnagel also proposes a method for analyzing the resonance between system functions, the Functional Resonance Analysis Method, or FRAM[27].

Figure 1. The four resilient abilities, organized as system functions, illustrated in FRAM notation (I: Input; O: Outputs; T: Time; C: Controls; P: Preconditions; R: Resources)



Source: Adapted from Hollnagel[28].

Traditional safety management in complex systems is usually reactive and oriented towards what went wrong during the occurrence of adverse events, because of risks perceived as unacceptable. Interventions generally focus on standardization, protocols, checks and barriers to make failures less likely and on correcting the consequences[29]. From the perspective of resilience, the Safety-II approach shifts the focus of safety management from the exclusive consideration of adverse events, failures and forms of preventing them, to understanding and strengthening the skills that serve to continuously foster safety in everyday practice[22]. These skills include, among other things, the multiple checks naturally developed by interprofessional teams, informal or tacit work practices, increasingly common in health work.

Damen et al.[30] describe a case in which an experienced health manager uses a personal checklist to guide the perioperative period of patients, although he was not formally responsible for this task, in order to detect treatment plans that deviated from the recommended practice. From a systematic review that identified 13 studies in the field of primary care, Robertson et al.[31] identified characteristics and factors associated with resilience. They conclude that the workspace is a key factor in daily performance and, therefore, there is a need to develop ways to assess resilience that reflect the multidimensional nature of health work. Such studies indicate that the nature of resilience is multifaceted, that is, it incorporates individual, social and work environment factors. Thus, Safety-II addresses the role of workers in promoting and maintaining a culture of resilience, in a continuous and non-normative manner, seeking to understand which acts or practices, explicit or apparently hidden, favor or hinder resilience.

Safety-II's ideas can also be applied to the broader level of health systems functioning, not just 'frontline' work. Verhagen et al.[32] provide a simplified example of resilience skills in hospital management of COVID-19 patients. As a monitoring skill, they highlight the monitoring of the relationship between the number of admitted patients with COVID-19 and the number of employees on leave due to the disease itself, as a way of predicting the impact and demands of the pandemic. The ability to respond allows changing the team's schedules and treating non-urgent cases in outpatient units or in the community itself, in order to improve care for serious cases. The ability to anticipate involves prospecting the impact of the increase in infections on the capacity of the health system, while the ability to learn promotes reflection on how the response to previous waves was.

Thus, these examples demonstrate how resilience, as an emerging property of the functioning of health systems, refers mainly to the development of a culture, introducing aspects of quality and safety in care as objectives that must be managed together, and not separately.

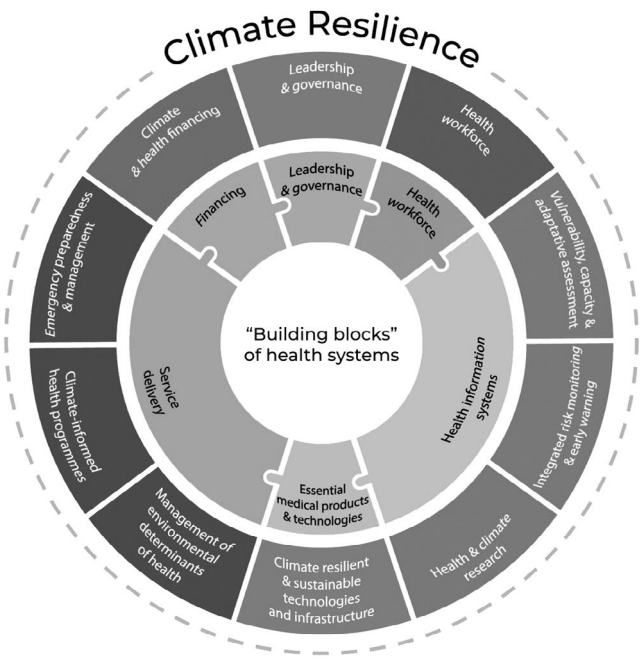
Organization of components and resources of health systems in favor of resilient performance

The recent COVID-19 pandemic has brought up the need to know the operating conditions of health systems under unpredictable and changing circumstances. This was, in a way, due to the low effectiveness of some evaluative models in predicting the capacity of health systems to deal with the pandemic. In a very symbolic example, then-US President Donald Trump said, in a speech during the initial moments of the pandemic, that the US health system would have no difficulties in combating (or even eliminating) COVID-19 given its high evaluation at the Global Health Security Index (GHSI), an important tool for evaluating health systems[33,34].

Recently, recognizing the problems in the response to the pandemic, the United States of America raised the status of the surveillance division of the US Department of Health as a way to improve the monitoring and anticipation skills of the health system and, thus, implement faster and more effective responses to the progress of the pandemic[35] – an adaptation to strengthen elements of the system to improve performance in resilience.

There are several initiatives that implicitly point to important components for the resilience of health systems. The GHSI model includes indicators of strength and preparedness of health systems. The World Health Organization (WHO) proposes a framework – represented in *figure 2* – for the operationalization of resilient health systems in the face of the effects of climate change[36] which, although specific, relate to the dimensions that the WHO calls 'bricks', or 'building blocks' of resilient health systems[37].

Figure 2. WHO framework for operationalizing climate-resilient health systems



Source: World Health Organization[36].

Strength, preparedness and response are some of the terms extensively adopted in the international literature related to the institutional capacity of health systems[38-43]. This indicates, even if tacitly, not integrated or restricted, the importance of certain components for the development of the potential of health systems for resilient behavior in relation to the next crises, such as new epidemics and disease outbreaks, disasters (natural or no), progressive increase in the demand for universal access to health, mass immigration, wars, etc.

Responses to COVID-19 made it possible to identify the relationships between different aspects of health systems and resilience. Haldane et al.[10] identified response actions to COVID-19 based on the framework proposed by the WHO, illustrated in *figure 2*. In their study, they present resilient measures related to governance and financing, community engagement, provision of health care, health workforce adaptations, use of medical technologies, and functioning of public health functions.

The European Observatory on Health Systems and Policies, an entity linked to the WHO, emphasizes the importance of being prepared and managing extraordinary events to which health systems are subjected as a way of strengthening everyday resilient behavior44. Some variations of this definition have greater emphasis on the aspect of health security, such as Adger's proposal[45], which considers that health systems with more resilient performance are those less exposed to the risk of being affected by extraordinary and sudden events – something also dependent on the continual development of potential for resilience. Adger's approach highlights the aspect of risk exposure as something that is mitigated as a system becomes more resilient.

Overview and prospects for the resilient performance of the SUS

Jatobá et al.[46], when analyzing the work of community health agents in home visits, observed adaptations in the visit protocol due to the goals established by the management and the restrictions of the work environment, mainly related to access to families in violent and vulnerable communities. Arcuri et al.[15], based on modelings carried out before the pandemic, forecast difficulties faced by teams from the Mobile Emergency Care Service (SAMU-192) in Alto Solimões during the peak of COVID-19 in 2020 in the region.

Both studies demonstrate aspects of resilience and fragility in home visits and in urgent and emergency care for vulnerable populations, important and challenging functions of the SUS that are daily affected by challenges such as: demographic and epidemiological transitions and crises in governance arrangements, technical assistance models, financing restrictions, in addition to adaptations to the local social ideology about public policies, typical of developing countries[47-49].

In the Brazilian case, there are still constant challenges to combat the historical underfunding of the SUS, the consequences of the economic crises and their impacts on the sustainability of the programs, judicialization and, at the community and social level, access and the guarantee of the right to health, elements that make the SUS even more susceptible to disruptive events[50].

Aspects such as vulnerability and social determinants of health also need to be taken into account in research on the actual functioning of the SUS[51-53], and, consequently, the resilience of its components, functions and activities. Likewise, resilience is fundamental for the long-term sustainability of the SUS, and is also important for providing the interprofessional care necessary for its essential principles, that is, the system must be able to provide personnel, teams, organizations, support systems, financing and services that people need, when they need them, regardless of their social, economic and cultural conditions. Thus, the ability to ensure an adequate SUS response to events such as the COVID-19 pandemic for all populations, whether urban,

remote, vulnerable or not, depends on the collaboration between health professionals in favor of the ability to anticipate future events, learn from experience and monitor the current context.

In this sense, initiatives to catalog and disseminate good health practices collaboratively developed by health service teams and communities are fundamental[54]. Understanding and multiplying successful practices promotes resilience, in the sense that it develops learning capabilities to deal with both the stress of operations under expected day-to-day conditions and unexpected situations.

SUS management can benefit from more comprehensive analysis focusing on the causes and effects of the low potential for resilience in institutional capacity[55]. In addition, financing models, in the complex context that usually involves public policies, need to be reassessed based on the lessons learned in the face of recent crises and the consequent depletion of resources[56].

New conceptual frameworks involving the resilient abilities of health systems should promote organization and innovative forms of analysis of the global indicators adopted in the management of the SUS, such as the formulation of composite indexes that translate the systems' potential for resilient behavior. A system with the level of complexity of the SUS will only have its potential for resilience properly represented if it is through a framework of indicators capable of aggregating its structural and functional aspects.

Conclusions

The institutional mission of the SUS is proving to be quite challenging in a scenario that points to a continuous increase in complexity, the possibility of new health crises, combined with investment restrictions caused by fiscal austerity policies, increased poverty and weakening of the public service. The COVID-19 pandemic has reminded everyone of the importance of long-term planning and scaling, as well as the need for health systems with ever-increasing potential for resilient performance. It is important for health managers to continuously assess the resilient abilities of health systems in order to enhance their strengths and mitigate existing weaknesses.

Being prepared to deal effectively with the next health crises requires systems that are increasingly capable of behaving resiliently. Anticipating gaps in preparedness, monitoring appropriate indicators, responding based on specific priorities, and learning to develop plans to guide and sustain health care delivery are crucial skills that the SUS needs to develop and maintain at all levels of complexity to ensure effective universality, equity and integrality.

Collaborators

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