Building Future-Ready Healthcare: Resilience and Preparedness for Global Health

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Abstract

The increasing challenges of global health, such as pandemics, disasters, climate change, and emerging diseases, require stronger preparedness within healthcare systems. The COVID-19 pandemic offers important lessons for all countries in responding to health emergencies, from shortages of medical supplies to disruptions to routine services. Therefore, integrated resilience and preparedness within healthcare systems are essential for responding. Strong global health requires government commitment, international collaboration, and public participation. Healthcare disaster readiness aims to improve the preparedness and response time of disaster relief professionals and volunteers at all levels, both before and after disasters. This article was compiled using a literature review method, using 9 articles from 2020 to 2024 from search databases, namely Google Scholar and Scribd, covering the topic of health system resilience. The search was limited to articles written in English and included original studies and reviews. We are required to make critical decisions in urgent and complex situations, and we need to base these decisions on analysis of data and information that may be relevant to our decision-making. Preparedness is only the initial step in self-protection, which can be damaged at any time if used over a long period, just like expired medicines. Even countries with better healthcare capabilities and healthcare workers cannot control the pandemic more effectively.

Keywords: Disaster Preparedness, Global Health, Healthcare, Increasing Challenges, Resillience

Introduction

Resilience and preparedness are crucial for healthcare systems. The need to build resilient healthcare systems is increasingly evident in an era marked by unprecedented global challenges, such as the COVID-19 pandemic, natural disasters, and emerging infectious diseases. Health system resilience refers to the capacity of a healthcare system to withstand shocks, adapt to changing circumstances, and maintain essential functions during times of crisis. (1). The rapid spread of the COVID-19 pandemic has further highlighted long-standing gaps and barriers in the global health security architecture that hinder public health systems from preventing, detecting, and responding to international infectious disease threats.

Barriers to public health system prevention. Prevention of health system barriers can be achieved through strengthening promotive and preventive efforts, providing health facilities and infrastructure, improving the quality and accessibility of services, and utilizing technology and education more extensively and effectively. Prevention can be implemented in any form and anywhere.

Barriers to public health system detection. Barriers to public health system detection include limited resources (personnel, funding, facilities), lack of adequate infrastructure and connectivity (especially in remote areas), fragmented data and unintegrated information systems, and low public and health worker knowledge and awareness of procedures. The public health system's barriers to detection are due to a lack of resources.

Health systems strengthening is a critical component of epidemic and pandemic preparedness and response, supporting essential public health functions including robust health infrastructure, a trained and protected health workforce, adequate funding, reliable supply chains, and evidence-based planning and coordination. (2)

Although most countries faced challenges in maintaining an optimal response throughout the pandemic, preliminary research indicates that health systems that were able to maximize the use of the core components of robust global health resilience (such as surveillance, laboratory facilities, and risk communication) and basic Universal Health Coverage (UHC) interventions (e.g., primary health care, affordable medicines and equipment, accessible health infrastructure, and public health personnel) tend to be better at protecting their populations from the social and economic consequences of the pandemic. These findings underscore the urgency of fostering coalitions and cross-sector partnerships, increasing data accessibility through research, reaffirming political commitment, and strengthening the role of government leadership.

Material and Method

Material

Our research materials consist of various secondary sources related to the concepts of resilience and preparedness in the health care system in Indonesia and globally. These sources were used to obtain a comprehensive overview of the policies, strategies, and innovations implemented to strengthen health systems in various countries. The materials used included international scientific literature in the form of journal articles published in the last five years, reports and official documents from global health organizations, qualitative secondary data obtained from global databases such as the Global Health Observatory to describe the conditions and capacities of health systems in various countries, and country case studies.

Method

This study uses a "literature review" method, which means gathering information from existing sources. The search for articles to be used comes from two databases: Google Scholar and Scribd. The article search was conducted using five main keywords: Disaster Preparedness, Global Health, Health Services, Rising Challenges, and Resilience to narrow the search results. The article selection process includes identifying articles based on keywords.

Results and Discussion

Based on the results of the journal analysis, the researcher successfully identified 9 scientific articles that met the requirements for analysis in this literature review. These articles were published both nationally and internationally, with a focus on Indonesia between 2020 and 2024. The selected studies involved several hospitals in various regions in Indonesia and other international countries (3).

Result 1

Table 1. Summary of Literature Riview for the year period 2021-2024

No.	Author and Years	Result
1.	(J. EL-Matury et al., 2023)	The readiness of Haji Abdoel Madjid Batoe Batang Hari Jambi Regional Genera l Hospital (HAMBA Hospital) in facing Covid-19 is assessed as ready with a score of 95.6% based on the N-COV Hospital Readiness Checklist because it implements preparedness measures according to WHO guidelines. (4)
2.	(Ras et al., 2024)	Although there have been efforts to improve health services in Takalar Regency through health facilities such as Poskesdes and health cadres, limited funds and health resources, inadequate health infrastructure, lack of public awareness, minimal support and regulations from the central government mean that health services are not yet optimal. (5)
3.	(Noor et al., 2021)	The existence of disparities such as geographical factors, culture, and the availability of quality health services that occur between urban and rural communities, especially the elderly, still poses a challenge to maintaining the resilience of the health system in Indonesia. (6)
4.	(Yeoh et al., 2023)	The resilience of global health systems, including Indonesia, has weakened in the face of the COVID-19 pandemic. This has disrupted cancer care, including delayed diagnoses, reduced treatment (chemotherapy and radiotherapy), and limited palliative care. (7)
5.	(Sulistiadi et al., 2024)	Climate change poses significant challenges to Indonesia's health system, particularly in social, economic, and cultural aspects. To increase health system resilience, adaptive strategies are needed, including increasing public awareness, strengthening

infrastructure, cross-sector coordination, and leveraging technology to mitigate the impacts of climate change. (8)

Result 2

Table 2. Matrix Literature Riview

Author	Method	Participant	Result
Yared Boru Firissa, Menbeu Sultanb, Mahdi Abdelwah, Fitsum Kifle Belachew	Mix Method (Kuantitatif and kualitatif)	18 Participant	This study identified significant gaps in disaster preparedness and response management at public referral hospitals in Addis Ababa, Ethiopia. These gaps include a lack of disaster-specific guidelines, communication networks, a functioning disaster management team, and inadequate storage facilities for medicines and equipment. (9)
Sandesh Kumar Sharma & Neeraj Sharma	Mix Method (Kuantitatif and kualitatif)	80 Participant	The study findings revealed significant gaps in preparedness, training, and capacity to address emergencies in district hospitals and community health centers in Rajasthan during public health emergencies, particularly the COVID-19 pandemic (10)
Mera Delima, Aldo Yuliano Mas Putra	Kualitatif	4 Participant	The medical and managerial support readiness of Ibnusina Yarsi Hospital in Bukittinggi is also still lacking, including a lack of ward supplies, mass casualty treatment equipment, and cramped assembly areas, despite ongoing hospital expansion. Other facilities and infrastructure are adequate (11).
Lola Sugiarni & Arif Susanto	Deskriptif Kuantitatif	6 Participant	The study was conducted to evaluate the preparedness of the Al Islam Bandung Women's and Children's Hospital (RSIA) in dealing with emergencies or disasters. The results showed that the hospital had achieved a preparedness level of 79%. Preparedness measures implemented included risk identification, risk analysis, risk mapping, and simulations and training. However, deficiencies were still identified in terms of early warning systems, equipment procurement, and infrastructure such as fire alarms and sprinkler systems (12).

Discusion

Result 1

Health system preparedness in Indonesia is a crucial aspect in facing health crises such as disease outbreaks, natural disasters, or other emergencies (13). Research by (8) shows that despite significant efforts to strengthen health infrastructure in remote areas, inadequate health facilities remain. This has the potential to exacerbate the impact of health crises due to limited public access to essential health services. Research by (6) and (5) complements this by explaining that one of the main obstacles is the

disparity between urban and rural communities, which impacts the quality of health services due to geographic factors. A similar situation also occurs in Takalar Regency, where limited funding and minimal local government support hinder the optimization of health services in the area's health facilities. These differences in findings indicate that uneven policy implementation remains a major challenge in achieving equitable health system preparedness across Indonesia. By implementing a comprehensive and sustainable strategy, Indonesia's health system can become more resilient in facing future health challenges.

Result 2

A study conducted by (9) "Disaster response readiness assessment of public hospitals in Addis Ababa City, Addis Ababa, Ethiopia" found significant gaps in disaster preparedness and response management in public referral hospitals in Addis Ababa, Ethiopia. These gaps include the lack of disaster-specific guidelines, communication networks, functioning disaster management teams, and inadequate drug and equipment storage facilities. This study evaluated the disaster preparedness of public hospitals in Addis Ababa, focusing on disaster plans, infrastructure, human resources, and logistics. Only 50% of hospitals had disaster-specific guidelines, with trauma being the only disaster covered.

A study conducted by (10) titled "Hospital Preparedness and Resilience in Public Health Emergencies at District Hospitals and Community Health Centers" also discussed the concept of hospital resilience, with recommendations for improving disaster preparedness and response. The study revealed significant gaps in preparedness, training, and capacity to address emergencies in district hospitals and community health centers in Rajasthan during public health emergencies, particularly the COVID-19 pandemic.

A study conducted by (11) titled "Hospital Disaster Plan in Disaster Preparedness Planning" on disaster management at Ibnusina Yarsi Hospital in Bukittinggi was not fully optimized. Medical support was lacking, including limited wards, mass casualty handling equipment, and limited assembly areas. Furthermore, only a Rapid Response Team was formed, while a RHA Team and a Health Assistance Team were missing. Communication systems were adequate, with telephones, mobile phones, and walkie-talkies (HTs), but some team members did not carry walkie-talkies, hampering communication during the disaster.

The study conducted by (12), "Description of the Preparedness of the Al Islam Maternity and Child Hospital (RSIA) Bandung in Facing Emergency or Disaster Conditions" shows that the Al Islam Maternity and Child Hospital Bandung has achieved a level of preparedness of 79%. However, deficiencies are still found in terms of early warning systems, procurement of equipment, and infrastructure such as fire alarm systems and sprinklers.

Many hospitals that have achieved a good level of preparedness have emergency response teams, training programs, and effective early warning systems. Research highlights the importance of improving hospital preparedness to protect communities and reduce the impact of disasters on human health and life.

Conclusion

Health systems that are ready for the future must focus on improving resilience and preparedness in the face of various global threats. The experience of the COVID-19 pandemic highlights the importance of robust systems, cross-border collaboration, and the use of technology in maintaining the continuity

of health services. By strengthening infrastructure, human resources, and data-driven policies, the world can build health systems that are more adaptive, inclusive, and responsive to future challenges.

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References

1. Barasa E, Mbau R, Gilson L. What is resilience and how can it be nurtured? A systematic review of empirical literature on organizational resilience. Int J Heal Policy Manag [Internet]. 2018;7(6):491–503. Available from: https://doi.org/10.15171/ijhpm.2018.06

2. Haldane V, De Foo C, Abdalla SM, Jung AS, Tan M, Wu S, et al. Health systems resilience in managing the COVID-19 pandemic: lessons from 28 countries. Nat Med [Internet]. 2021;27(6):964–80. Available from: http://dx.doi.org/10.1038/s41591-021-01381-y

3. Nurul fajriah, sutopo patria YS. Analisis Kebencanaa dan Komitmen Managemen Rumah Sakit Indonesia. Issn 2597-6052. 2022;2(1):365–73.

4. El-Matury HJ, Handayani S, Ginting S, Sari M, Sitorus FE, Sembiring BM, et al. The Resilient Health System Against the COVID-19 Pandemic: The Study of Resilience of RSUD Haji Abdoel. J Kesehat Komunitas [Internet]. 2023;9(3):464–70. Available from: https://doi.org/10.25311/keskom.Vol9.Iss3.1120

5. Ras A, Sultan, Arsyad Genda, Dimas Ario Sumilih, Hariashari Rahim, Andi Nurlela, et al. Tantangan Dan Peran Pemerintah Dalam Meningkatkan Pelayanan Kesehatan Di Kabupaten Takalar. J Publicuho. 2024;7(3):1574–85.

6. Noor ZA, Sekarningrum TD, Sulistyaningsih T. Disparitas perkotaan-pedesaan: pemerataan dalam akses layanan kesehatan primer untuk lansia selama pandemi Covid-19. JPPI (Jurnal Penelit Pendidik Indones. 2021;7(4):576.

7. Yeoh K, Wu Y, Chakraborty S, Elhusseiny G, Gondhowiardjo S, Joseph N, et al. Global Health System Resilience during Encounters with Stressors – Lessons Learnt from Cancer Services during the COVID-19 Pandemic. Clin Oncol. 2023;35(4):e289–300.

8. Sulistiadi W, Wasir R, Thalib W, Ayuningtyas D, Bawazier N, Buskens E. Building health systems resilience: understanding the social, economic, and cultural impacts of climate change from stakeholders' perspectives in Indonesia. Arch Public Heal [Internet]. 2024;82(1). Available from: https://doi.org/10.1186/s13690-024-01403-4

9. Firissa YB, Sultan M, Abdelwahab M, Kifle Belachew F. Disaster response readiness assessment of public hospitals in Addis Ababa City, Addis Ababa, Ethiopia. African J Emerg Med [Internet]. 2023;13(3):210–6. Available from: https://doi.org/10.1016/j.afjem.2023.06.004

10. Sharma SK, Sharma N. Hospital Preparedness and Resilience in Public Health Emergencies at District Hospitals and Community Health Centres. J Health Manag. 2020;22(2):146–56.

11. Black, R. E. et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. 2020;8(1):(10222), 243-260.

12. Kesiapan G, Sakit R, Rsia A, Islam A, Menghadapi D, Darurat K. Abstrak. 2023;(October).

13. Ikhsani AM. Analisis Dampak Bencana Alam Terhadap Ketahanan Kesehatan Indonesia. ResearchGate [Internet]. 2023;(December):0–8. Available from: https://www.researchgate.net/publication/376783623%0AANALISIS