



## Health Systems and Health Security: An Updated Review for The Main Contribution of Healthcare Security Workers

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### Abstract:

#### Background

Health security represents the collective efforts to minimize vulnerabilities to acute public health events. Healthcare security workers are pivotal in ensuring the seamless integration of health systems to mitigate risks during emergencies. The critical relationship between health systems and health security underscores the need for robust frameworks, especially in light of recent global crises like the COVID-19 pandemic.

## **Aim**

This study aims to evaluate the main roles of healthcare security workers in hospitals by exploring their contributions to maintaining health system resilience and preparedness.

## **Methods**

A rapid scoping review methodology was employed to analyze peer-reviewed literature, focusing on the application of the WHO's six building blocks framework in health security contexts. The review synthesized evidence highlighting the operational and strategic roles of healthcare security workers within integrated health systems.

## **Results**

Healthcare security workers play essential roles in emergency preparedness, surveillance, and resource management. Their responsibilities span from ensuring compliance with international health regulations to strengthening leadership and governance during crises. The study also emphasizes the importance of health financing, responsive service delivery, and robust health information systems as critical enablers of health security.

## **Conclusion**

Healthcare security workers are vital for fostering resilient health systems capable of mitigating public health risks. Their involvement in multidisciplinary strategies and frameworks, such as the WHO's Health Systems for Health Security model, is indispensable for addressing contemporary health security challenges. Investing in their training and operational capacity is crucial for enhancing global health security outcomes.

**Key Words:** health security, healthcare security workers, resilience, health systems, WHO building blocks, emergency preparedness

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## **Introduction:**

The World Health Organization (WHO) defines health security as the collective actions, both proactive and reactive, necessary to minimize vulnerabilities to acute public health events that pose threats across geographical regions and international boundaries [1]. Health systems are delineated as encompassing the WHO Building Blocks framework, which consists of the essential components, resources, organizations, and institutions dedicated to improving, maintaining, or restoring health. This framework also incorporates the WHO's common goods for health model, which facilitates the delivery of these foundational elements. Academically, the field of health systems has traditionally prioritized non-communicable diseases (NCDs) due to their significant impact on routine health system operations, while health security has primarily focused on communicable diseases because of their potential for rapid transmission. However, a critical interrelationship exists between health systems and health security, with historical and practical links between public health and security being well-documented [2, 3]. These connections highlight shared factors or interdependencies, such as the role of health systems in mitigating NCDs to reduce comorbidities that exacerbate infectious disease outbreaks. Additionally, well-established health systems capable of managing NCDs are better positioned to serve as a frontline defense during communicable disease outbreaks. Conversely, inadequately trained health workforces compromise both health systems and health security, hindering preparedness and response efforts during crises such as pandemics.

The interrelationship between health systems and health security is further illuminated through literature on disease control, which underscores a longstanding concern over emerging diseases and their security implications for governments [4, 5], economies [6], social stability [7], and population security [8]. The conceptual link between robust health systems and enhanced health security has become increasingly prevalent within global health discourses, supported by frameworks like the International Health Regulations (IHR) [9] and initiatives such as the Global Health Security Agenda (GHSa) and One Health [10–13]. Despite rhetorical emphasis, however, investments in health system strengthening to bolster health security have lagged, with momentum waning after past epidemics. The COVID-19 pandemic underscored

the profound connection between health system capacities and effective health security responses, revealing systemic deficiencies across income settings. These included insufficient emergency planning and leadership [14], inadequate health communication and literacy [15], equipment shortages [16, 17], disruptions in medical supply chains [18], and limited surge capacity [19]. Fragmented integration of private sector healthcare providers further complicated national pandemic responses, highlighting the necessity of strong health systems equipped with essential capacities and resources at all levels [20].

Recognizing the imperative for resilient health systems and the need for deeper exploration of health security-health system linkages, the WHO introduced the Health Systems for Health Security framework in 2021 [21]. Developed in collaboration with researchers from the University of Leeds, this framework addresses gaps in health systems to enhance preparedness for public health events. It emphasizes fostering a shared understanding of health systems for health security and identifying critical capacities for preparedness, including those outlined in the revised IHR benchmarks, dynamic preparedness matrices, and investment priorities across related sectors.

The framework employs the WHO Building Blocks model as a heuristic to define and integrate essential health system components, ensuring comprehensive management, promotion, and delivery of effective national healthcare [22]. The six interdependent building blocks—leadership and governance, health workforce, health financing, responsive health services, health information systems, and access to essential medical products—serve as the foundation for addressing health security challenges. Strengthening these components requires a systems-wide approach rather than isolated interventions. While the Health Systems for Health Security framework offers practical insights, gaps in empirical evidence remain. There is limited research explicitly synthesizing the relationship between health system strengthening and health security through the lens of the WHO Building Blocks. Additionally, few studies examine all six components from a health security perspective, necessitating further exploration to bridge this evidence gap. In collaboration with the WHO, researchers from the University of Leeds conducted a rapid scoping review to assess how health system thinking, using the six building blocks, has been applied to conceptualize and operationalize the links between health systems and health security in peer-reviewed literature. This effort aims to enhance understanding and inform global strategies for resilient health systems that support robust health security frameworks.

### **Health Security Issues:**

A systematic search was conducted to examine the relationship between health systems and health security. Due to the absence of synthesized evidentiary material addressing this association, the complexity and heterogeneity of the agenda, and time constraints, a rapid scoping review was deemed the most suitable approach [25–28]. This review utilized an augmented methodology initially developed by Arksey and O'Malley [29] and subsequently refined by Levac et al. [30] and the Joanna Briggs Institute [31]. The findings highlighted a prevalent tendency in the literature to prioritize a security framework over an integrated analysis of how health systems can complement health security strategies. The overarching role of health systems in delivering health security was often treated as secondary, with limited detailed examination. Publications that focused primarily on health systems constituted 21.6% of the reviewed literature, while those emphasizing health security accounted for 8.3%. Notably, no publication explicitly employed all six WHO building blocks as a systems lens to investigate health security promotion, underscoring a fragmented approach to this interconnected relationship.

The concept of health security was frequently framed as an exceptional response rather than an integral element of the broader public health continuum or health system strengthening. This exceptionalism often led to isolated recommendations targeting specific building blocks or subsets thereof, disregarding comprehensive health systems approaches. For instance, critiques by Paul et al. [35] highlighted how traditional health security paradigms focused on costly countermeasures rather than prevention and systemic strengthening. Literature addressing access to essential medicines, such as Elbe's critique of the "pharmaceuticalisation" of health security, emphasized the disruptive societal impact of pandemics [36]. However, responses often prioritized pathogen control measures, such as vaccine stockpiling, over

addressing root causes, reflecting a short-term cost-minimization strategy rather than a commitment to long-term health system capacity building [37]. This exceptionalism was also evident in the literature's focus on surveillance, where health system strengthening was frequently assessed by its capacity for early risk detection and response, rather than its broader disease risk management capabilities. Njeru et al. [40] argued that this narrow focus often led to siloed improvements, primarily benefiting public health surveillance systems while neglecting the potential system-wide advantages of technological advancements. Financial and investment considerations similarly revealed gaps in addressing contextual obstacles, such as geographic remoteness [41], subsidy transfer challenges [42], and the lack of transition from short-term relief to long-term development programs, as seen during the West Africa Ebola outbreak [43].

The literature predominantly concentrated on acute health emergencies, with less emphasis on preparedness. A majority of publications addressed infectious diseases, while only a small fraction discussed preparedness or non-communicable diseases (NCDs). Among the infectious diseases, the 2014–2016 Ebola outbreak in West Africa received significant attention, serving as a lens to critique the weaknesses of health systems in low-income countries and the inadequacies of global health governance [46]. Discussions on health system enhancements for health security often focus on specific building block subsets, such as service delivery and information systems. These analyses prioritized infrastructure and regulations for data management during emergencies, with limited attention to routine capacities, such as those required for NCD management or overall health system resilience [47]. The conceptualization of health security as state security, rather than individual or population health security, was another recurring theme. This interpretation frequently framed health security risks as threats to national interests, emphasizing issues like economic competition, military readiness, and political stability [54]. Publications on leadership and governance often highlighted the prioritization of national sovereignty, as exemplified by the reluctance to share H5N1 samples, which underscored competing domestic and international priorities [55]. This national security perspective shaped approaches to surveillance, pharmaceutical stockpiling, and bioterrorism, often to the detriment of broader health system strategies [37, 57].

Geographically, the literature demonstrated a predominant focus on low- and middle-income countries (LMICs), particularly in Sub-Saharan Africa. Nearly half of the publications centered on LMICs, compared to only 17% addressing high-income countries (HICs). Sub-Saharan Africa was frequently depicted as the source of global health security challenges, with countries like Afghanistan and Uganda highlighted for their limited capacity to detect and respond to disease outbreaks [58, 59]. The 2014–2016 Ebola outbreak was often cited to illustrate how weak health systems in low-income regions posed global health security risks [60, 61]. Conversely, publications related to HICs focused on pandemic response capacities and measures to mitigate the spread of infectious diseases originating from the Global South [57, 75]. This geographical focus and the framing of the Global South as the origin of health security issues underscored the need for a more equitable and integrated approach. Strengthening fragile health systems and fostering global mechanisms for coordinated responses were recurrent recommendations, emphasizing the potential of investments in Universal Health Coverage (UHC) and Common Goods for Health to yield long-term health security benefits [51, 52]. Such perspectives advocate for a paradigm shift towards viewing health security as an integral component of resilient health systems, rather than as an isolated or exceptional concern.

The under-representation of non-communicable diseases (NCDs) in health security research reveals a critical disparity, driven by the traditional focus on communicable diseases and related control measures. This limited scope neglects the broader health threats posed by the intersection of communicable diseases, such as SARS-CoV-2, and NCDs, which are significant contributors to multimorbidity. Despite the high prevalence and mortality associated with NCDs, only a small fraction of the reviewed literature addresses them, with just 1% of studies focusing on NCDs as a group or in relation to specific conditions like cancer or cardiovascular diseases [76–78]. This imbalance highlights the need for a more inclusive approach that addresses the determinants of health security and acknowledges the growing burden of NCDs in global health systems [78]. Strengthening health system building blocks is vital for improving readiness, resilience, and health security outcomes. Practical examples underscore how investments across the six

WHO Building Blocks enhance system capacity. For instance, leadership and governance are fundamental to emergency preparedness and compliance with international health regulations. Indonesia's National Action Plan for Health Security (2020–2024) integrates broader health system investments, emphasizing primary healthcare [79]. Pre-existing emergency plans in Mexico City and New York City facilitated coordinated responses to the Influenza AH1N1 outbreak through enhanced surveillance, training, and intersectoral decision-making [62]. Such cases underscore the importance of strategic policy frameworks, pre-crisis preparedness, and adaptive strategies informed by past emergencies [80–84].

Health financing also plays a central role in promoting security. Thailand's Universal Health Coverage Scheme and related policies highlight the benefits of linking health system strengthening with universal health coverage to achieve sustainable, long-term health security outcomes [85–87]. Similar approaches were effective in post-Ebola West Africa, where increased health budgets and universal health coverage contributed to resilience and preparedness [60, 51]. Notably, Lebanon's financial reforms during the Syrian refugee crisis ensured continuity of services and reduced out-of-pocket expenditures, further emphasizing the link between sustainable financing and system resilience [88]. Additionally, Saudi Arabia's integrated health security measures, including vaccination campaigns and enhanced disease monitoring during the Hajj, demonstrate the efficacy of multisectoral approaches to mitigate infectious disease outbreaks [89]. Investments in health information systems also yield substantial health security benefits. In Uganda, post-Ebola initiatives to improve community-based surveillance systems enhanced preparedness and clinical care [90]. Reviews emphasize the role of surveillance systems, data management, and laboratory integration in supporting both routine services and emergency responses [91–94]. For instance, Cyprus demonstrated how streamlined information technologies improved emergency preparedness and routine service delivery [33]. Collaborative networks among national and regional laboratory systems further strengthen health security in low- and high-income countries [91, 95–100].

The health workforce is a cornerstone of health security. Programs like Field Epidemiology Training Programs (FETP) and the African Field Epidemiology Network (AFENET) have advanced workforce capacities in data collection and analysis, with international support bolstering epidemiological and laboratory competencies [58, 99, 101–104]. Local initiatives, such as those in Uganda and Tanzania, highlight the positive impact of targeted training programs on health workforce capabilities and broader system preparedness [105]. However, the literature identifies gaps in addressing wider workforce needs and system-level improvements, suggesting an area for further attention. Access to essential medical products, vaccines, and technologies remains critical to health security. Uganda's innovations in cold-chain systems and test algorithms demonstrate the importance of infrastructure in pathogen identification and response [106]. Indonesia's integration of affordable medicines into its National Health Insurance System offers lessons for linking health system development with security priorities [107]. Such initiatives underscore the importance of integrating technology and equitable access into broader health security strategies to address current and future challenges effectively.

### **Analysis of Health security Roles:**

#### **An Undervalued Link Between Health Systems and Health Security**

A critical observation from the scoping review is the limited integration between health systems research and health security within the literature. Despite focusing on highly relevant sources ( $n = 63$ , [30.8%]), the concepts were rarely explicitly connected, suggesting a tendency to treat these fields as separate or to assume implicit linkages. This separation raises significant questions about the current understanding of their relationship and its implications for policy and practice. While specialization in research is necessary, this lack of integration contradicts recent calls to embed securitized issues within health systems and overlooks efforts to position health system improvements as a fundamental element of health security [51, 108]. For instance, the World Health Organization (WHO) is developing a position paper advocating resilient health systems that align universal health coverage with health security goals [109]. Historically, the divergence between health systems and health security may stem from distinct research approaches. Health security is often framed as an exceptional condition, primarily addressing acute emergencies, and is

treated as separate from routine health policy [110]. This perception, coupled with assumptions of preparedness in high-income countries (HICs) and a focus on the Global South, may explain inadequate responses to crises like COVID-19 [111]. Such framing perpetuates the notion of health security as a rare event, fostering complacency and reactionary approaches. This perspective has led to a disease-specific focus in global health policy, where urgent threats like HIV/AIDS, pandemic influenza, Zika virus, and Ebola gain prominence only to be replaced by new emergencies [39, 112, 113]. Consequently, critical aspects such as primary healthcare and foundational health system functions are often overlooked, despite their integral role in strengthening preparedness and promoting universal health coverage [43, 109].

Furthermore, the literature inadequately reflects the mutual dependency between health systems and health security, even though past governance failures, such as siloed approaches to HIV/AIDS, have highlighted the need for integrated strategies [114, 115]. Following the West African Ebola epidemic, calls for systemic reforms emphasized the importance of resilient health systems that operate effectively both during crises and in routine contexts [11, 43]. Despite emerging discourse, health security remains largely disconnected from broader health and development agendas [117]. This disjointed approach poses challenges for global health governance and long-term investment strategies. COVID-19 underscored these gaps, with significant economic losses, resource mobilization issues, and disruptions to essential health services highlighting the need for a broader systems approach [109, 118–121]. For instance, while HICs faced challenges in managing surges in healthcare demand, low- and middle-income countries (LMICs) required scalable workforce solutions during emergencies. These findings illustrate the necessity of integrating health security into comprehensive health system investments to enhance global preparedness and resilience.

### **An Overly State-Centric Understanding of Health Security**

Health security is predominantly conceptualized through a state-centric lens, often sidelining human security and broader population health concerns, such as mental health and the continuity of critical services [34, 122]. This security-oriented discourse fosters a threat-based logic that prioritizes state interests, framing health issues within the context of national integrity and border protection [13, 124]. The resultant policies often emphasize surveillance and control, sometimes at the expense of equitable health outcomes. For instance, "vaccine nationalism" during COVID-19 led to inequitable access, with wealthier nations pre-purchasing most vaccine supplies and underfunding global health initiatives like the ACT-A Health Systems Connector [126, 127].

This state-centric view reinforces a problematic narrative that positions the Global South as a source of threats rather than as contributors to health security solutions. Such bias is evident in the focus on surveillance at entry points and discriminatory migration health policies, which overlook the benefits of integrating healthcare services in LMICs [50, 88, 130]. Moreover, this approach fails to acknowledge that universal health coverage and health security are intrinsically linked. Effective health systems ensure equitable access to services and financial protection while strengthening emergency preparedness [109]. Examples from Thailand and Mexico demonstrate the potential of aligning these goals to enhance health outcomes [85, 131]. Recent progress, spurred by the pandemic, includes the WHO's framework on health systems for health security, which advocates for integrating population-level services with emergency preparedness functions. This shift aligns with calls from various global health committees for unified strategies that address systemic gaps and foster resilience [132]. However, the persistent separation of universal health coverage and health security represents a missed opportunity to build cohesive systems capable of addressing both routine and emergency health needs. Addressing these challenges requires a holistic perspective that balances state interests with global health equity and sustainability.

### **Main roles of Health security Workers in Hospitals:**

Health security workers in hospitals play an indispensable role in ensuring the safety and functionality of healthcare systems during routine operations and public health emergencies. Their responsibilities extend beyond physical security to encompass critical aspects of health systems, preparedness, and response

mechanisms. These roles can be broadly categorized into surveillance and monitoring, emergency preparedness, coordination and collaboration, resource management, and education and training.

### **Surveillance and Monitoring**

A primary responsibility of health security workers is to implement robust surveillance systems for early detection and management of health threats. By monitoring epidemiological trends, they help identify outbreaks and mitigate the spread of communicable diseases within hospitals. This function is vital in minimizing risks associated with healthcare-associated infections and ensuring compliance with infection prevention protocols.

### **Emergency Preparedness**

Health security workers are pivotal in designing and implementing emergency preparedness plans. These plans encompass simulations and drills for hospital staff, the establishment of isolation wards, and the development of protocols for managing sudden patient surges. During emergencies like pandemics, their ability to anticipate and respond to crises ensures that hospitals can maintain operational continuity while safeguarding both patients and staff.

### **Coordination and Collaboration**

Collaboration with various stakeholders, including public health authorities, government agencies, and hospital administration, is another key role. Health security workers facilitate the integration of hospital activities with broader health security frameworks, such as the International Health Regulations (IHR) and national pandemic response plans. This coordination ensures timely communication and action, which are critical in addressing large-scale health threats.

### **Resource Management**

Effective resource allocation and management are central to the role of health security workers. They oversee the availability of essential supplies, such as personal protective equipment (PPE), medical devices, and pharmaceuticals, ensuring that hospitals are equipped to handle both routine healthcare needs and emergencies. During crises, their efforts prevent supply chain disruptions and ensure equitable distribution of resources.

### **Education and Training**

Health security workers are also responsible for fostering a culture of safety and preparedness through training programs. They educate hospital staff on infection prevention measures, the use of emergency equipment, and adherence to safety protocols. These efforts enhance the overall resilience of healthcare systems and reduce vulnerabilities during crises.

### **Addressing Systemic Gaps**

Beyond immediate actions, health security workers contribute to identifying and addressing systemic weaknesses in healthcare systems. Their insights into gaps in health system components—such as leadership, governance, and financing—inform strategies for long-term strengthening and resilience. This role is increasingly critical in light of challenges such as non-communicable diseases (NCDs) and multimorbidity, which complicate health system responses to communicable disease outbreaks.

### **Advocating for Equity**

Health security workers also advocate for equitable healthcare access, recognizing the interdependence of health security and universal health coverage. They emphasize investments in healthcare infrastructure and policy reforms to ensure that even marginalized populations receive adequate care, thereby reducing the overall burden on health systems. In conclusion, the roles of health security workers in hospitals are multifaceted and integral to the broader objectives of health systems and security frameworks. By bridging gaps, coordinating responses, and fostering resilience, they ensure that hospitals remain prepared and capable of addressing both routine health needs and emergent public health threats.

## Conclusion

Healthcare security workers in hospitals play a multifaceted role in ensuring the operational resilience and preparedness of health systems. Their responsibilities encompass leadership in governance, resource allocation, surveillance, and compliance with international health standards such as the International Health Regulations (IHR). These workers are instrumental in strengthening the six WHO building blocks: leadership and governance, health workforce, health financing, service delivery, health information systems, and access to essential medical products. For example, during emergencies, healthcare security workers facilitate strategic coordination and intersectoral collaboration to manage risks effectively. Their roles also include overseeing the deployment of resources, ensuring adequate training for healthcare personnel, and integrating health services to handle surges in demand during public health crises. By enhancing health communication and literacy, these professionals support informed decision-making and public trust, which are essential during pandemics. Healthcare security workers also contribute to health financing by advocating for policies that ensure sustainable investments in health systems, linking universal health coverage with health security outcomes. Additionally, they play a critical role in managing the medical supply chain, addressing shortages, and ensuring the availability of essential medicines and equipment during crises. Despite their crucial contributions, gaps in empirical evidence about their specific roles highlight the need for further research. Integrating the comprehensive health systems approach with health security measures offers a more sustainable strategy for addressing challenges. For instance, focusing on non-communicable diseases alongside infectious diseases can mitigate multimorbidity risks, enhancing overall system resilience. In conclusion, healthcare security workers are indispensable to the success of health security frameworks. Strengthening their roles through targeted investments in training, infrastructure, and policy reforms will not only improve health system functionality but also enhance global preparedness for future public health emergencies. Acknowledging their contributions and addressing existing gaps can pave the way for more equitable and robust health security measures worldwide.

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الأنظمة الصحية والأمن الصحي: مراجعة محدثة لمساهمة العاملين في أمن الرعاية الصحية

#### الملخص:

**الخلفية:** يمثل الأمن الصحي الجهود الجماعية لتقليل نقاط الضعف أمام الأحداث الصحية العامة الطارئة. يلعب العاملون في أمن الرعاية الصحية دورًا محوريًا في ضمان التكامل السلس للأنظمة الصحية للحد من المخاطر أثناء حالات الطوارئ. وتبرز العلاقة الحرجة بين الأنظمة الصحية والأمن الصحي الحاجة إلى أطر قوية، خاصة في ظل الأزمات العالمية الأخيرة مثل جائحة كوفيد-19.

**الهدف:** تهدف هذه الدراسة إلى تقييم الأدوار الرئيسية للعاملين في أمن الرعاية الصحية في المستشفيات من خلال استكشاف مساهماتهم في الحفاظ على مرونة الأنظمة الصحية واستعدادها.

**الطرق:** تم استخدام منهجية مراجعة سريعة لنطاق الأدبيات لتحليل البحوث المنشورة في المجالات المحكمة، مع التركيز على تطبيق إطار العمل المكون من ستة عناصر أساسية الذي وضعته منظمة الصحة العالمية في سياقات الأمن الصحي. قامت المراجعة بتجميع الأدلة التي تسلط الضوء على الأدوار التشغيلية والاستراتيجية للعاملين في أمن الرعاية الصحية ضمن الأنظمة الصحية المتكاملة.

**النتائج:** يلعب العاملون في أمن الرعاية الصحية أدوارًا أساسية في التأهب لحالات الطوارئ والمراقبة وإدارة الموارد. تشمل مسؤولياتهم ضمان الامتثال للوائح الصحية الدولية وتعزيز القيادة والحوكمة أثناء الأزمات. كما تؤكد الدراسة على أهمية تمويل الصحة، وتقديم الخدمات بشكل استجاباتي، وأنظمة المعلومات الصحية القوية باعتبارها عوامل تمكين أساسية للأمن الصحي.

**الاستنتاج:** العاملون في أمن الرعاية الصحية ضروريون لتعزيز الأنظمة الصحية المرنة القادرة على الحد من المخاطر الصحية العامة. إن مشاركتهم في الاستراتيجيات والأطر متعددة التخصصات، مثل نموذج الأنظمة الصحية من أجل الأمن الصحي لمنظمة الصحة العالمية، لا غنى عنها لمواجهة تحديات الأمن الصحي المعاصرة. يعد الاستثمار في تدريبهم وبناء قدراتهم التشغيلية أمرًا حاسمًا لتحسين نتائج الأمن الصحي العالمي.

**الكلمات المفتاحية:** الأمن الصحي، العاملون في أمن الرعاية الصحية، المرونة، الأنظمة الصحية، عناصر منظمة الصحة العالمية الأساسية، التأهب للطوارئ.