

ADDRESSING CORRELATED EFFECTIVE LEADERSHIP, GOVERNANCE, AND RESILIENCE STRATEGIES IN HEALTH SYSTEMS DURING THE SARS-COV-2/COVID-19 PANDEMIC ERA FOR THE PRESENT AND FUTURE

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ABSTRACT

This work attempts to present a succinct new understanding of the impact of crisis-induced innovation for resilience in health and healthcare during the COVID-19 pandemic era. Leaders of health and healthcare implemented, monitored and evaluated diverse innovative strategies for leadership, communication and accountability for adequate resilience during the pandemic. Within the context of resilience, disparate innovative solutions can be disparately based on impacts into situational, structural, and systemic resilience necessitating frameworks for harnessing newfangled solutions and the effect on resilience in health and healthcare. Although, there was accelerated leadership response to the pandemic, the overall crisis management was broadly tailored by the directives of governments. Leadership is pertinent to ensure traditions, cultures and values which are not embellished with target setting, status hierarchies, rules and regulations. SARS-CoV-2/COVID-19 presumably had a positive impact during the pandemic due to decrement in expenditure, increment in savings, as depicted in spending more time with family and spending less money on entertainment. Better life appreciation, survival through difficulties, gratitude for the importance of life. Literature in health systems resilience emphasises that focus should not merely be on absorbing unprecedented and unpredictable shocks due emergence of health needs, but ensuring continuity in health progress, sustainable benefits in the functioning of health and healthcare systems and fostering quality of life. Since SARS-CoV-2/COVID-19 globally overwhelmed health systems, discourse and polemics on resilience has created a sense of expansive urgency, with pertinence to explicate the ingredients of local and global responses by means of a lens of resilience. In conclusion, future research in leadership and crisis leadership competence mechanism through training and change are pertinent for the potential of leadership development intervention and creativity to advance health system resilience. Generally, organizations are increasingly dependent on data infrastructure and analytics teams but several strategic decisions are governed by conventionality, intuition, political bargaining, pro forma or strategic ambiguity. This article theorizes effective leadership individual competencies, routine organizational practices, and governance presentations whereby leaders systematically integrate resilience into strategic decision-making during the SARS-CoV-2/COVID-19 pandemic.

KEYWORDS: local and global health systems, hospitals and nursing homes, economic burden.

INTRODUCTION

The COVID-19 pandemic behaved as an unprecedented stress test on global health systems, unravelling the rigidity of conventional, up-bottom structures, prioritising a shift towards a leadership laden with complexity and adaptiveness. The crisis depicted that resilience does not merely concern shock survival but the potential and capability anticipation, absorption, adaptation, and recovery. Pivotal challenges focused on meandering extreme unpredictability, management of disruptive,

isolated and restricted information, and accountability maintenance irrespective of flexible procurement regulations and expansive pressure.^[1,2] Healthcare systems confront increased systemic risk as a result of the ingrained uncertainty and complexity of their modalities which frequently culminate in stress-laden events affecting the welfare and well-being of healthcare personnel. These are capable of compromising the efficacy and effectiveness of healthcare systems. Resilience enhancement between healthcare personnel are crucial for the maintenance of

high-quality care and patient safety assurance.^[3] The COVID-19 pandemic indicated the necessity for leadership and leadership development as highly significant and critical.^[2] Since the inception of the pandemic, institutions have taken into cognizance the relevance of resilience processes, with efforts to prepare them against crises in the future. COVID-19 has significantly impacted the manner organisations function and relate to recent incidents which need to be explicated.^[4] In global healthcare delivery, the COVID-19 pandemic presented extreme challenges requiring vital approaches for response to a resilient health system. The background resilience is commonly referred to in the assessment of the potential and maintenance of health systems functionalities during unprecedented occurrences. Primary healthcare^[5] constitutes the primordial health system, and indubitably its resilient responses are of importance to the outcomes of the entire system. Elucidating how primary healthcare institutions can develop resilience prior, during, and following unpredictable shocks is pivotal to public health readiness. This work inter alia attempts to establish how leaders health systems interpret alterations in their operational ambient during the era of COVID-19, and elucidation of reflections and perspectives^[6] of resilience on healthcare.^[7] This work exemplifies challenges and lacunae in scientific literature in the spheres of organisational resilience contextually inter alia SARS-CoV-2/COVID-19 pandemic era.

Resilience enhancement in health systems during the crisis of the SARS-CoV-2/COVID-19 pandemic

The COVID-19 pandemic outbreak was an era of unpredictability and unprecedented dilemma and stress for health and healthcare managership due to paucity of information and knowledge of the aetiology, pathogenesis and pathophysiology^[8-10] including deficiency of organised structures and therapeutic modalities. That was an era devoid of the sustainable potential to weather a global healthcare crisis, while adapting to the extant health status, to extract didactic lessons from the prevailing conditions which constitute vital significance for operative units^[11] for emergency care. Globally, the SARS-CoV-2/COVID-19 pandemic unpredictably and unprecedentedly unleashed sustained impact on health and healthcare systems, not merely due to the encumbered pressures from the pandemic, but to its emergence and adaptation to the perceptibly ever-changing and never-ending issues to be addressed into the future. There were rapid transformations in clinical practice, new care models, focused resources and newfangled strategies were implemented at accelerated pace to undergird increasing number of infected patients and alternative modalities of care delivery and vaccinations. As a result of globalisation, resilience became relevant than previously due to increased and intensified shocks on the health system and enhanced impacts.^[12] The resilience of the health system is a composite collective effort, resulting from incessant pursuit and targeted investments of concerned

stakeholders. The investments unravel challenges, opportunities and priorities for innovative resolutions, solutions and sustain the accountability of actors in the global health system. Experiences and perspectives highlight the crucial role of organisations in the development of resilient health systems. Contextually, strengthening governance, a bi-directional information exchange, and focused science leverage for effect can attract enhanced potential of resilience in health systems. Specifically, governments and diverse organisations present spheres of contribution in the trajectory towards resilience and carry the societal responsibility for the prioritisation of enhanced attributes of resilience. The building of resilience will not merely accord countries preparedness for future shocks but connect diverse health and development agenda for better positioning of the nexus between humanitarian aid, development cooperation, geopolitical accountability,^[13] and drive advancements to face COVID-19 or other emerging or re-emerging pandemic in the future. In the initial pandemic wave, there were disparate adaptations towards identical agenda to undergird the health and healthcare system to respond locally and globally, with select staff redeployment and engagement on COVID-19 response programmes.

Effective leadership impact on health and healthcare during the COVID19 pandemic

The aetiologies of change in healthcare are due to technological progress, ageing and vulnerable populations, alterations in disease patterns, trajectories and novel drug deliveries, targets and discoveries for disease therapy which necessitate healthcare personnel to modify nearly frequently.^[14] The strategy that ensures healthcare leaders comprehend the specific needs of patients constitutes and adaptive leadership philosophy essential to improve patient outcome and staff well-being, as well as enhance a resilient healthcare ambient. Healthcare leaders can employ their management skills for the promotion and improvements health and healthcare literacy within personnel and patients through fostering patient-focused care, a continuous education milieu and overt communication. Effective leadership in healthcare impacts the efficacy, efficiency and effectiveness of healthcare delivery, patient engagement, welfare, quality of life and the well-being, job satisfaction and retention of healthcare personnel; thus, aiding healthcare through studies which translate the trajectory of information and knowledge to practice for the future in the healthcare industry shifting from fragmented, infrastructural and pecuniary decadence, especially in vulnerable and low income societies. Effective healthcare leadership is essential for ensuring high-quality patient care, enhancing organizational performance, and fostering the professional development of healthcare professionals.^[15] Effective leadership in healthcare impacts the efficiency and effectiveness of healthcare delivery, patient interaction, the welfare/well-being, job satisfaction and retention of healthcare personnel. In addition,

effective leadership enhances the future of healthcare through research as knowledge is translated to practice.

The essence of ethical leadership, leadership development and maintenance of ethical behavior demand institutionalization of pellucid and defined standards as well as expectations for personnel. Leaders must ensure in the organizational awareness of the sustainable mission, vision, values, and goals by focusing on clear standards which place all and sundry on the same ethical trajectory and platform which ensure conducting functions with adroit administrative corporate responsibility and humane integrity.^[16] The leadership strategy inculcates steadfastness on serving the needs of employees based on a servant-leadership moral-based platform whereby leaders prioritise the fulfillment of the needs of employees, patients and other stakeholders, rather than their personal needs and satisfaction. The trait theory of leadership emphasises the identification of discrete traits which make a leader effective; and defines or translates aspects of inborn or innate qualities and characteristics which enhance the potential for leadership qualities imbibed from inter alia intelligence, personality and physical attributes.

Governance and national responsibilities during the pandemic

The COVID-19 pandemic presented a global crisis that manifested differently across scales, triggering multiple interrelated crises, including economic and social disruptions. The impact of the on city-regions worldwide has necessitated a re-evaluation of leadership practices, prompting leaders to reflect critically on how to navigate a future pandemic depicted by equity, sustainability, and democracy within regional governance structures. Place-based leadership, a concept that emerged in the mid-2000s, posits that leadership should be distributed across society, with local leaders playing a pivotal role in addressing local challenges through context-specific solutions. The concept of place-based leadership examines how leadership adapts to, manages, and copes with crises. Utilising a framework developed from existing literature and practical experience as a key respondent during the COVID-19 pandemic.^[17] It is paramount to research how healthcare organizations create, maintain and advance resilience within never-ending distortions and disruptions such as pandemics, regulatory transformations and resource deficiencies. It employs dynamic capabilities theory (DCT) for explicating or elucidating the processes which potentiate institutions to sustainably endure essential services in the complexity of resource-deprived ambients.^[18] Organizations which enact and maintain essential services amidst crises foster public trust and engagement while protecting susceptible and low income populations.

The capability of a country to cope with crisis correlates with its resilience level. Although, there are efforts to explicate the concept of health system resilience, but the

study of its operationalisation is grossly neglected, as evidenced in the SARS-CoV-2/COVID-19 era.^[19] The COVID-19 pandemic exerted immense pressure on healthcare systems. In-depth contextual analysis for optimal identification of an enabling environment and the required capability to develop a certain level of resilience are required for the transformation into practice of the expertise for the enactment and development of a resilient healthcare system.^[19] Health challenges, such as coronavirus disease 2019/COVID-19 have become increasingly complex, transnational, geopolitical, unprecedented and unpredictable. Research on the health system responses to the SARS-CoV-2/COVID-19 pandemic is offers the latitude to improve local and global elucidation of health system resilience and create a more transparent association between practical ideas and theoretical concepts on the development of resilience.^[20] The knowledge of health system resilience continues in coherence since the occurrence of the COVID-19 pandemic. The resultant repercussions of system transformations and the resilience of subsystems are rarely elucidated. Within governance, the health system resilience concept can be associated on broader issues such as inclusivity prompted by the pandemic. The utility of resilience theory strengthens health systems during crises, with the advantages of continuous refinement of extant resilience theory.

The most veritable enhancer of health system functionality is governance that provides the basis and leverage for resource production, finance, and service delivery with assurance of sustainable operation in coordination with other spheres of the health system; encompassing and interacting between stakeholders, levels and actors. Although, there is no agreed upon framework for governance assessment, country instances are illustrations the way governance has contributes to health systems resilience in crisis. Prior to the COVID-19 pandemic, it is clear that good governance supported and strengthened by means of state prowess, political leadership and community involvement is pivotal to responding resilient response in the outbreak of a novel COVID-19 infectious disease.^[21] Thus, governance continues to be a pivotal attribute for an effective response to the COVID-19 pandemic. Governance effectivity and efficacy at multifarious stages, such as the entire health system functionalities, and encompassing beyond the health system fulfill a resilient response and buffer against ineffective political leadership. Whereas transformations in crisis governance are achievable in the pandemic, these cannot be enacted or enforced within a vacuum, and must take into cognizance extant issues, challenges, opportunities and priorities, in the face of formal and informal power structures. Nascent adaptive strategies to governance appeared during the pandemic involving increased participants at all levels in response to the pandemic supporting the machinery of government and governance.^[21-23] The resilience concept was adapted to public health discipline to research health systems

resultant impact due to health crises, the conditions which ameliorated the thrust, and the reorganisation following the capitulation of the crisis. Following the inception of the COVID-19 infection, the COVID-19 pandemic due to the SARS-CoV-2 virus constituted a worldwide challenge in 2020 that demanded prompt action to an unprecedented health crisis in the annals of modern civilization, especially in Western countries.^[24-27] Certain researchers believed that the intensity of the crisis in countries with inequitable distribution of resources suffered mostly regarding emergency services, and health personnel experiences at every sphere of medical care during the scourge.^[27]

The functionalities of hospitals and nursing homes during the crisis

The COVID-19 pandemic ushered in a global crisis for healthcare systems, particularly hospitals and intensive care units, with nursing homes and homecare services responsible for the elderly and extremely vulnerable group of patients had to adapt and transform for the safety of patients and personnel, whereby leaders introduced newfangled solutions to be resilient in tackling the COVID-19 pandemic^[28] in maintaining proper care for patients under surveillance. The analysis of hospital resilience is essential in understanding health services preparedness for, and responded to abrupt shocks and unprecedented challenges in the COVID-19 health crisis, and in the context of the SARS-CoV-2/COVID-19 pandemic era. The major theoretical strategy based on resilience is the capacity of the system to sustain pertinent functions and to absorb, adapt, and transform during unprecedented or unexpected alterations.^[29]

The COVID-19 pandemic created significant challenges for healthcare professionals and the provision of hospital care, leading to immense stress and rapidly changing conditions. Hospitals had to constantly adapt their organizational structures and strategies to manage the crisis.^[27] Concomitant centralized and decentralized aspects of decision-making are effective, with organizational adaptation and learning during crisis being of immense importance in resilience theory. The COVID-19 pandemic enormously affected health-care systems worldwide, which culminated in several health-care studies. Nursing homes and homecare services were custodians of vulnerable groups of people, and heavily impacted by the pandemic. Managers in nursing homes and home care services employed disparately conforming approaches to tackle the COVID-19 pandemic.^[28] Hospitals usually function in intricately complex and dynamically unpredictable environments. Understanding how hospitals confronted such uncertainty during the COVID-19 crisis inculcated human and material resources, planning, reorganization, as well as decision-making.^[29] It is pertinent that hospitals offer flexibility without suppressing efficiency through enabling opportunities and priorities for better preparedness and response to environmental alterations, challenges and issues. Modification of capabilities grant organizations more

resilience and responsiveness during incessant and extant uncertainty.

DISCUSSION

This article explores the interplay between public administration and community resilience during the COVID-19 pandemic era, with regard to the studies conducted, nascent topics in resilience research, and inculcated lessons^[30] for the future. Processes of resilience are tailored by attributes that augment community vulnerability, such as environmental, morphological and sociocultural, which constitute pivotal drivers of resilience in newfangled adaptive capacity, digital and technological spheres, as well as the discrete and unique impact on resilience modalities with community-focused initiatives and multidimensional, across-the-board integration. These components and ingredients enhance resilience sustenance, adaptiveness or modification. Strengthening public administration^[5] promotes community resilience but restricted access to public services elevates vulnerability, especially in low income societies presenting inequitable distribution of resources, and debilitated mindset and social conflict for resilience, necessitating trajectories for opportunities and priorities in social relationships, wellbeing and sustainability in quality of life.

Leadership role in times of crisis has intensively drawn attention but the resultant impact of crisis leadership on ameliorating supply chain distortions within the healthcare sector has been elusive in research. It became necessary to bridge the lacuna of the theory in supply chain leadership^[31] by applying an inductive strategy in developing a crisis leadership theory on ameliorating supply chain disruptions in the healthcare system in navigating issues and challenges presented during the COVID-19 pandemic era. This may immensely contribute to the ABV, UET and supply chain theories of risk management, and purposeful trajectory for inter alia healthcare personnel for future research. This discourse offers an aspect of latitude for management of the crisis but evidential lacunae and perturbations subsist. Managing numerous uncertainties broadly depends on the quality of the trajectory of decision-makers at all stages and administrative levels, wherein management of COVID-19 in a contextually precarious healthcare system became diverted to awareness-raising and a surveillance system, with ostensibly building a resilient healthcare system in leadership ability, community dynamism and extant culture of learning.^[19] These extend understanding for sharing of information, absence of rigidity and proper leadership, learning, essential service maintenance, and pertinence for legitimate, interdependent systems. Decision-making, trust, interdependence, and modifications become important in monitoring risks and repercussions of alterations beyond the health system, such as inclusivity and trans-sectorial resilience and private sector alliances were identifiable factors from the COVID-19 pandemic for future exploration. The COVID-19 pandemic exerted immense pressure on healthcare

systems via depicting the relevance of intensive contextual analysis for better identification of an enabling environment and the propensities for development to determined resistance level, with translation into practice of the expertise to enact a resilient healthcare system for the future.^[32-34] Processes for assurance of local and national collaboration for effective shock response and advanced preparedness for future emergencies, particularly infectious disease outbreaks which disseminate through community transmission and necessitate sensitive responses, and inculcated as a dual measure for improved pandemic response and health services.^[35-37] With evolving of health governance local and national collaboration must be ardently established into crisis management and responses as well as governance and resilience trajectories.^[38]

This analysis considers that the health systems benefited from the initiatives of health personnel which in certain instances beneficially surpassed their functions. Considering their resilience analysis, nations were able to confront the effect of the crisis geopolitically^[39,40] and deal with it; as the transformative capacity due to the implemented approaches for health services adaptation of resource management by institutions. The lesson and expertise exhibited represent strengthening pertinent functionalities of health systems and the trajectories for positively addressing the increasing intricacies and complexities of health issues, challenges, opportunities and priorities of the future.^[41,42] Adequate strengthening of pertinent functionalities in health systems inculcates improvement of primordial structures, such as service delivery, health staff, information systems, medicines, technologies, financing, and leadership for enhanced resilience and efficiency. This strategy proportionally highlights the progressive complexities of future health challenges, issues, opportunities and priorities concerning pandemics, ageing populations, and economic burden.^[43-45]

Reflections and perspectives on resilience modalities

This study explores timely and complex issues of the multidimensional spheres of leadership, communication, accountability and resilience in health systems during the SARS-CoV-2/COVID-19 pandemic and for the future. The COVID-19 crisis has exposed paramount vulnerabilities in global health systems, whereby explicating, elucidating and understanding the confounding factors via the lenses of resilience and leadership are of immense pertinence for contemporaneous sustainability measures and preparedness for the future. The article relates the transition of health and healthcare systems per resilience during the COVID-19 pandemic era^[46] with emphasis on the roles of leadership, communication, and accountability; and a strategic framework encompassing incipient fundamental building blocks, streamlined adaptations, and extended growth modalities to promote resilience of health systems. This conceptual work relates that resilience extends greater than mere shock absorption to imbibe proactive expectations and adaptations, with

focused leadership functionality in the mechanisms as proposed. Overall, the presentation highlights clinical practice transformation in hospitals and nursing homes, the relevance of impactful communication, and prerequisites for governance structures which engender resilience.

This article offers a robust theoretical framework for conceptual resilience in health systems, undergirding an overall delivery of leadership dynamics. The conceptual discourse provides novel insights into the strategic functions of leaders in treading and ameliorating pandemic-propelled crises focusing on both local and global perspectives which expatiates the pertinence of the topic across disparate healthcare contexts. This paper invites significant interdisciplinary inquiry, particularly around the integration of health policy and leadership theory within resilience frameworks. It raises important ethical questions regarding equity and accessibility in global health systems, especially as they relate to the differential impact of pandemics on vulnerable populations. Furthermore, as health systems continue to evolve post-COVID-19, the insights from this study could contribute to the ongoing dialogue on long-term health system transformation and resilience building. Overall, the study contributes immensely in understanding the intricately complex interplay between leadership and resilience in health systems during the COVID-19 pandemic era. It highlights both a theoretical exploration and practical implications which are relevant for extant and future health crises. In tackling the methodological disruptions and distortions as well as expatiating on the scalability of its intentions, the presentation significantly advances the discourse on health system resilience in academia, policy-making and public administrative spheres.^[5] In essence, the article ignites insightful dialogue on the reconceptualization of health and healthcare systems as evident in current global issues, challenges, opportunities and priorities unravelling extant vulnerabilities, optimistic adaptive possibilities in leadership and governance resilience^[47] in the scourge of any pandemic or crisis in the future.

CONCLUSION

The responsibility of the leader of a healthcare organization involves charting a novel strategic goal, vision and mission, high-level operation monitoring and evaluation, ameliorating pecuniary risks and broadening overall organizational growth. The essence of healthcare resilience is to influence members to develop and inculcate behaviours, idiosyncrasies, processes and technologies which occur in sustainable arenas to exchange care. Local and global health infrastructures need to be improved for better and optimum response to future pandemics by focusing on recruitment, training and prioritising healthcare workers, effective establishment of surveillance and response systems, confidence building in health services via community health, inclusivity of SARS-CoV-2/COVID-19 vaccines in conventional immunization

packages, as well as empowerment and strengthening of logistics and supply. Therefore, the leadership role in healthcare must inculcate staff support, forthrightness, empathy, altruism, accountability and sustainability. Overall, leaders reacted to the SARS-CoV-2/COVID-19 pandemic by initial transitioning from containment approaches to amelioration, with focus on accelerated scaling up of healthcare capacity, employing digital technology, and fortifying supply chains. Local and global health systems became increasingly resilient by inculcating shock absorption, conditioning to accelerated altering states, and modify their modalities to sustain pertinent services. The SARS-CoV-2/COVID-19 pandemic presented as a principal stress format for worldwide health systems, subjecting them to take up, modify, and evolve for sustenance of unexpected, accelerated, and sustained distortions. These constitute a strategic framework to manage change, as organizations initially adopt tested frameworks or baseline apparatus, adapt same to comply with specific requirements, and consequently alter strategies for long-range growth and resilience. This mechanism extends greater than mere compliance to enhance incessant advancement and newfangled measures. Health system resilience is defined as the potential to manage, and be educated from shocks induced by pivotal reactions, as well as the accelerated application of telemedicine, the development of transient surge prowess, and prompt health workforce mobilization.

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REFERENCE

- Lorenzon N, de Almeida RS, Wimmer D, Simbrig I et al. Development of a Pandemic Resilience Competence Model for Healthcare Professionals—Individual and Organisational Aspects. *Int. J. Environ. Res. Public Health*, 2025; 22(5): 712. <https://doi.org/10.3390/ijerph22050712>.
- Castelyn C. Leadership in healthcare during a pandemic: for a systems leadership approach. *Front Public Health*, 2024; 12: 1361046. doi: 10.3389/fpubh.2024.1361046.
- Gil-Hernández E, Carrillo I, Martín-Delgado J, García-Torres D, Mira JJ. Development of a Web-Based Intervention for Middle Managers to Enhance Resilience at the Individual, Team, and Organizational Levels in Health Care Systems: Multiphase Study. *JMIR Hum Factors*, 2025; 12: e67263. doi: 10.2196/67263.
- Paeffgen T. Organisational Resilience during COVID-19 Times: A Bibliometric Literature Review. *Sustainability*, 2023; 15(1): 367. <https://doi.org/10.3390/su15010367>.
- Chukwuma Sr C. Whither the Trends, Innovations and Expertise of the New Public Administration? *Innovations in Economy and Policy Research*, 2024; 5(1): 7-16.
- Chukwuma Sr C & Bjurulf P. A case study of the information-base needed for effective evaluation of primary healthcare programmes in Anambra State, Nigeria. *Int J Hlth Sc.*, 1990; 1(2): 137-148.
- Karreinen S, Paananen H, Kihlström L, Janhonen K, Huhtakangas M, Viita-Aho M, Tynkkynen LK. Living through uncertainty: a qualitative study on leadership and resilience in primary healthcare during COVID-19. *BMC Health Serv Res.*, 2023; 23(1): 233. doi: 10.1186/s12913-023-09223-y.
- Chukwuma Sr C. Pathophysiologic Processes, Correlates and Comorbidities of Obesity and Type 2 Diabetes Evidenced in the SARS-CoV-2/COVID-19 Pandemic. *Mathews Journal of Diabetes & Obesity*, 2025; 8(1). DOI: 10.30654/MJDO.10023.
- Chukwuma Sr C. Pathophysiological Mechanisms Associated with Comorbidity and Correlated Obesity and Type 2 Diabetes in Sars-Cov-2/Covid-19 Pandemic. *Sch J App Med Sci.*, 2025; 13(11).
- Chukwuma Sr C. Understanding The Pathophysiologic Mechanisms And Interplay Between SARS-CoV-2/Covid-19, Obesity And Diabetes With Incursions Into The Post-Pandemic Era. *World Journal of Pharmaceutical and Healthcare Research*, 2025; 2(12): 17–25. <https://doi.org/10.5281/zenodo.18045919>.
- Borzuchowska M, Kilańska D, Kozłowski R. The Effectiveness of Healthcare System Resilience during the COVID-19 Pandemic: A Case Study. *Medicina*. 2023; 59(5): 946. <https://doi.org/10.3390/medicina59050946>.
- Grimm PY, Wyss K. What makes health systems resilient? A qualitative analysis of the perspectives of Swiss NGOs. *Global Health*, 2022; 18(55). <https://doi.org/10.1186/s12992-022-00848-y>.
- Chukwuma Sr C. Geopolitical issues in health and biosecurity concerning gain-of-function research, emergence and re-emergence of infectious diseases. *International Journal of Clinical Virology*. 2022. DOI: 10.29328/journal.ijcv.1001043.
- Thimbleby H. Technology and the Future of Healthcare. *J Public Health Res.*, 2013; 2(3): e28. doi: 10.4081/jphr.2013.e28.
- Sayyed A, Sahu S, Deepika K, Sable S. Effective leadership strategies in healthcare: A narrative review. *Multidisciplinary Reviews*, 2024; 8(3): 2025090. DOI: 10.31893/multirev.2025090.
- Chukwuma Sr C. Undergirding environmental legislation and citizen participation in developing countries. *Int J Env Edu & Inf.*, 1996; 15(3): 319-330.
- Naicker T. Crisis leadership for place – an analysis of the Gauteng city-Region leadership response to the COVID-19 pandemic. *Social Sciences & Humanities Open*, 2025; 12(101790): 2590-2911. <https://doi.org/10.1016/j.ssaho.2025.101790>.
- Mishra S, Sharma A, Shivhare A, Srivastava M. Key drivers of organizational resilience in healthcare: a dynamic capabilities perspective. *J Health Organ Manag.* 2026. <https://doi.org/10.1108/JHOM-06-2025-0354>.

19. Accoe K, Criel B, Ag Ahmed MA, Buitrago VT, Marchal B. Conditions for health system resilience in the response to the COVID-19 pandemic in Mauritania. *BMJ Global Health*, 2023; 8: e013943. <https://doi.org/10.1136/bmjgh-2023-013943>.
20. Saulnier DD, Duchenko A, Otilie-Kovelman S, Tediosi F, Blanchet K. Re-evaluating Our Knowledge of Health System Resilience During COVID-19: Lessons From the First Two Years of the Pandemic. *International Journal of Health Policy and Management (IJHPM)*, 2022; 10.34172/ijhpm.2022.6659.
21. Sagan A, Webb E, Rajan D, Karanikolos M and Greer SL. COVID-19 responses in Europe – towards better governance. *Health System Resilience During The Pandemic: It's Mostly About Governance. Eurohealth*. 2021; 27(1).
22. Chukwuma Sr C. Convergence in Diplomacy, Geopolitics and International Cooperation for Human Health and Environment. *J Biomed Res Environ Sci.*, 2022; 3(8): 895-904. doi: 10.37871/jbres1529. <https://www.jelsciences.com/articles/jbres1529.pdf>.
23. Chukwuma Sr C. Global concerns and affairs in environment and health. *Int Jr Infect Dis & Epidemiology*, 2022; 3(4): 1-8. DOI: 10.51626/ijide.2022.03.00029.
24. Chukwuma Sr C. Geopolitics of the nature and crises of the environment, economics and health in a sustainable society for human progress and survival. *Journal of Scientific and Innovative Research*, 2024; 13(1).
25. Chukwuma Sr C. Challenges and opportunities in accessing veritable vaccines and curbing the dissemination and excesses of the SARS-CoV-2 or COVID-19 variants. *Middle East Publishers Scholars International Journal of Biochemistry*, 2021; 4(9): 108-111. DOI:
26. Chukwuma Sr C. Accessing vaccines with compliance to stem the emergence and dissemination of the SARS-CoV-2 or COVID-19 variants. eBook: *Research Trends of Microbiology*, MedDocs Publishers LLC, 2021; Volume 3, Chapter 2: 12-15. <https://bit.ly/3Cp663c>.
27. Juárez-Ramírez C, Reyes-Morales H, Gutiérrez-Alba G et al. Local Health Systems Resilience in Managing the COVID-19 Pandemic: Lessons from Mexico. *Health Policy and Planning*, 2022; 37(10). DOI: 10.1093/heapol/czac055.
28. Lyng HB, Ree E, Wibe T. et al. Healthcare leaders' use of innovative solutions to ensure resilience in healthcare during the Covid-19 pandemic: a qualitative study in Norwegian nursing homes and home care services. *BMC Health Serv Res.*, 2021; 21: 878. <https://doi.org/10.1186/s12913-021-06923-1>.
29. de Araújo Oliveira, S. R., Cazarin, G., Soares Sampaio, A., Ribeiro de Vasconcelos, A. L., Furtado, B et al. Potential Strengths and Weaknesses in Hospital Resilience in the Context of the COVID-19 Pandemic in Brazil: A Case Study. *Health Systems & Reform*, 2023; 9(2). <https://doi.org/10.1080/23288604.2023.2177242>.
30. Duvald I, Obel B, Lohse C, Kirkegaard H, Burton RM. Organizational resilience in emergency healthcare: Lessons from the COVID-19 pandemic in five Danish hospitals. *Social Science & Medicine*, 2025; 366. <https://doi.org/10.1016/j.socscimed.2025.117728>.
31. Ree E, Wiig S, Seljemo C, Wibe T, Lyng HB. Managers' strategies in handling the COVID-19 pandemic in Norwegian nursing homes and homecare services. *Leadersh Health Serv (Bradf Engl)*. 2023; 36(2): 200–218, doi: <https://doi.org/10.1108/LHS-05-2022-0052>.
32. Gifford R, Fleuren B, Westra Det al. To Uncertainty and Beyond: Identifying the Capabilities Needed by Hospitals to Function in Dynamic Environments. *Medical Care Research and Review*, 2021; 79(4). <https://doi.org/10.1177/10775587211057416>.
33. Gröschke D. The Interplay of Public Administration and Community Resilience During the COVID-19 Pandemic—A Rapid Scoping Review. *Conflict Resolution Quarterly*, 2025; 43(1): 133-157. <https://doi.org/10.1002/crq.21480>.
34. Tiwari M, Lodorfos G, McClelland Z, Nair S. Unravelling the complexities associated with Leadership During Times of Supply Chain Crisis: A Study on the Healthcare Sector. *International Studies of Management & Organization*, 2025; 1-34. DOI: <https://doi.org/10.1080/00208825.2025.2465002>.
35. Chukwuma Sr C. Health concepts, issues and experience in Abakaliki area, Nigeria. *Environmental Health Perspectives*. 1994; 102(10): 854-6. DOI: 10.1289/ehp.94102854.
36. Chukwuma Sr C- (1994): Environment and Development: A Social Evaluation Survey in Nigeria in 1992. *Int J Env Edu & Inf.*, 1994; 13(2): 183-208.
37. Chukwuma Sr C. Environment and Development: Approaches to strategies for the improvement of human well-being in Abakaliki area, Nigeria. *Environmental Conservation*, 1994; 21(4): 359-61. <https://doi.org/10.1017/S0376892900033695>.
38. Assefa Y, Woldeyohannes S, Cullerton K, Gilks CF et al. Attributes of national governance for an effective response to public health emergencies: Lessons from the response to the COVID-19 pandemic. *Journal of Global Health*, 2022. DOI: 10.7189/jogh.12.0502.
39. Chukwuma Sr C. Gain-of-Function Research and Geopolitics in the Emergence and Reemergence of Infectious Diseases and Microbiome Variants. *International Journal of Chemical and Life Sciences*, 2022; 10(8): 2197-2205. DOI: 10.2.1746/ijcls.2021.10.8.2.
40. Chukwuma Sr C. Environmental health perspectives on the emergence and re-emergence of infectious diseases, geopolitics and gain-of-function research. *Journal of biomedical research & environmental sciences*. 2021. DOI: 10.37871/jbres1386.
41. Chukwuma Sr C. Environmental health concepts and issues – A viewpoint. *Int J Env Studies*, 2001; 58: 631-44. DOI: 10.1080/00207230108711356.
42. Chukwuma Sr C. Information-Base and Determinants of Medical Specialization and Primary Care: A View

- Point, Journal of Biology, Agriculture, and Healthcare, 2014; 4(8).
43. Chukwuma Sr C. Explicating Spheres of Pro Forma and Strategic Ambiguity in Governance and Research for Sustainable Development, Journal of Bio-Med and Clinical Research, RPC Publisher, 2025; 2(2). DOI:<https://www.doi.org/rpc/2025/rpc.jbmcr/00392>.
44. Mills A, Rasheed F and Tollman S. Chapter 3. Strengthening health systems. Disease Control Priorities in Developing Countries. 2nd edition. Jamison DT, Breman JG, Measham AR, et al., editors. Washington (DC): The International Bank for Reconstruction and Development / The World Bank; New York: Oxford University Press, 2006.
45. Hosseini MM, Koohpaei A, Ebrahimipour H, et al. Policy options to address the effectiveness of health service management graduates in solving Iranian health system challenges: a mixed scoping review and policy Delphi approach. *e Clinical Medicine*, 2024; 77: 102875. <https://doi.org/10.1016/j.eclinm.2024.102875>.
46. Savage C, Tragl L, Castillo MM et al. Building resilience: analysis of health care leaders' perspectives on the Covid-19 response in Region Stockholm. *BMC Health Services Research*. 2024; 24(1): 408. DOI: 10.1186/s12913-024-10886-4.
47. Giarelli G. The Governance of Resilience. How the Health Systems Have Coped with The Covid-19 Pandemic. UniSa. Sistema Bibliotecario Di Ateneo. 2020, <http://elea.unisa.it/handle/10556/4781>.