

Public Health Policies in Hospital Management: Lessons and Challenges of the COVID-19 Crisis

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Received: 18.09.2024

Revised: 13.10.2024

Accepted: 27.11.2024

ABSTRACT

This research focused on analyzing public policies that were implemented in different health systems around the world for hospital management during the COVID-19 pandemic, using a systematic review methodology. Scientific sources, mainly articles indexed in Scielo, Web of Science (WoS) and Science Direct, are reviewed using a descriptive approach to organize and summarize the information collected. The selection of documents was carried out using key terms such as "publicpolitics" OR "COVID preventionpolitics", which led to the identification of 50 relevant articles in English and Spanish, published between 2019 and 2023. The evaluation focused on how public policies of different nations helped prevent the spread of COVID-19, offering an updated and detailed comparison of the effectiveness of these measures worldwide. The study emphasized the impact of these policies on health indicators such as infection, hospitalization and mortality rates. It explored how the implementation of different strategies, including lockdowns, vaccination programs, mask wearing and social distancing, influenced the trajectory of the pandemic. The results showed significant variations in the effectiveness of these policies, influenced by aspects such as the moment of implementation, the level of compliance of the population and the capacity of local health systems. The importance of effective health communication and education was highlighted as key elements to promote adherence to preventive measures. This analysis offered a comprehensive view of how public policies affect public health during the COVID-19 crisis, providing important lessons to confront future health emergencies. Thus, this study provided a detailed understanding of the relationship between COVID-19 prevention policies and their direct effects on public health, highlighting the need for effective public health management adaptable to the dynamics of a health crisis. The variability in the effectiveness of these policies highlighted the need to take into account sociocultural, economic, and health infrastructure contexts when designing prevention strategies.

Keywords: Preventive measures, health policies, health crisis, vaccination, effectiveness

INTRODUCTION

Governments around the world faced an unprecedented challenge with the onset of the COVID-19 pandemic. To curb the spread of the virus, they implemented various preventive policies and strategies, ranging from lockdowns and social distancing measures to large-scale vaccination campaigns (Whitsel et al., 2023). Governments played a crucial role, coordinating public health responses that encompassed surveillance and updating of information, testing, contact tracing, containment and prevention policies, and effective communication to the public. This coordination effort was carried out at multiple levels: local, state, regional, national, and international (Faghy et al., 2022).

The experience of the pandemic has provided valuable lessons for hospital management, highlighting the importance of a rapid and flexible response in health emergency situations. The need for robust and adaptable health systems was highlighted. In addition, collaboration and coordination between different jurisdictions and levels of government, as well as international cooperation, proved to be key factors for efficient crisis management.

According to Woo (2022), governments contributed financially to significant biomedical research, including the development of vaccines and treatments, and provided economic support to industries affected by lockdowns and decreased travel. They also managed travel restrictions and border crossings and addressed shortages in supply chains in various sectors, always considering national security, economic consequences, and the health and well-being of citizens. The measures adopted reflected a government management focused not only on public health, but also on economic and social stability and resilience, taking into account critical factors such as national security, economic impact, and the well-being and health of the population.

The UN's 2030 Agenda for Sustainable Development, with its 17 Sustainable Development Goals, provides a blueprint for global cooperation aimed at improving global health and well-being. This analysis will focus on how public policies can safeguard human life and health, covering areas such as cardiovascular health, mental health, obesity, hypertension, diabetes, and access to health insurance. In addition, the growing importance of telehealth and digital health, which have gained relevance and are considered essential today and for the future, especially in the wake of the pandemic (Whitsel et al., 2023; Wood, 2022). Therefore, this study aims to contribute to the understanding and improvement of policies aimed at these key areas, in line with the global sustainable development goals.

The long-term health impacts of the COVID-19 pandemic are still being recorded and will be assessed at a later date. The public health arena faced significant challenges, including urgently protecting people with chronic diseases from COVID-19, while ensuring adequate care for pre-existing conditions (Pronk & Faghy, 2022; Whitsel et al., 2023). Therefore, this situation highlighted the need for public health strategies that are flexible and adaptable, capable of addressing both immediate emergencies and long-term health needs.

Looking to the future, public health faces the challenge of understanding how the pandemic has affected both existing and new-onset chronic diseases, including those related to post-COVID syndrome (or long COVID) (Hacker et al., 2021; Whitsel et al., 2023). It is vital, therefore, to develop comprehensive strategies that address not only the immediate effects of the virus, but also its long-term consequences on the overall health of the population, ensuring an effective and lasting response to these new challenges.

Research on the cardio-metabolic effects following exposure to natural and man-made disasters suggests an increase in cardio-metabolic risk. However, Roziqin et al. (2021) indicated that many previous disaster-related public policies did not comprehensively incorporate factors linked to the social determinants of health (Pan et al., 2022).

An increased risk of severe illness or death from COVID-19 was recognized for people with pre-existing conditions such as asthma, cardiovascular disease, hypertension, obesity, and diabetes, among others. (SteelFisher et al., 2023). When referring to social and health determinants, access to care, transportation, nutritional security, housing and employment are mentioned, on the rates of viral infection and mortality during the pandemic was evident and will continue to be elucidated.

Thus, the main purpose of this study was to examine the public policies implemented in various health systems around the world for hospital management during the COVID-19 pandemic. The specific objectives of the research include (1) developing a conceptual framework on preventive public policies and (2) analyzing how public policies from different countries have contributed to the prevention of the spread of the pandemic.

THEORETICAL FRAMEWORK

This study addresses the complexity of research on the management of public policies applied in hospital administration during health emergencies, with a special focus on the lessons learned and the challenges that arose from the management of the COVID-19 pandemic. Various perspectives of countries that have used these approaches to increase efficiency and effectiveness in their health care management and quality processes were analyzed. An example of public policy to combat communicable diseases is the Political Declaration of the Third High-Level Meeting of the United Nations in 2018, which identified air pollution (both indoor and environmental/outdoor) as a risk factor for epidemiological diseases (K. Chen et al., 2023). Previously, India had included indoor air pollution in its national targets, but to date, ambient/outdoor air pollution is not yet part of these national targets (Hagger & Hamilton, 2022).

Since air pollution has been recognized as a health risk factor, especially in light of the pandemic. However, the understanding and acceptance of this problem by the health community is still limited. Therefore, it is essential that multisectoral participation is significantly expanded, forming part of a unified national action agenda (Shrivastav et al., 2023).

During the pandemic, public prevention policies highlighted the need to focus on five key factors associated with an increased risk of epidemiological diseases: premature mortality, tobacco use, alcohol, excessive salt or sodium intake, and lack of physical activity. The pandemic has exacerbated obesity rates, underscoring the importance of monitoring progress and fostering synergy of multisectoral actions among stakeholders to improve the prevention and control of epidemiological diseases such as COVID-19 (Rhee et al., 2022; Wang, 2023).

While containment policies were crucial in reducing COVID-19 mortality in many contexts, it is important to consider the indirect effects of these restrictions. Strategies to improve the resilience of health systems should be designed to ensure that populations can continue to access essential health care despite the presence of containment policies during future infectious disease outbreaks (Bargain & Aminjonov, 2020; Dong et al., 2022) From what has been analyzed, some of the most important studies for research mention one of the policies that was used was social distancing, however, if prevention and control policies can impose physical distancing without causing severe social distancing, people will generally consider these policies as a type of social support rather than social control. Previous studies have shown the importance of social and political support in alleviating depression in people suffering from crisis events. Therefore, health policies aimed at improving the

psychological well-being of people in a public health crisis must take into account the perception of risk. (Thing et al., 2020) (Thing et al., 2020; Glanz et al., 2022) (Search et al., 2022)

In Italy, various policies were adopted to prevent the spread of the pandemic, for action-oriented policy advice on the COVID-19 emergency in the post-lockdown phase. It was highlighted that the development and implementation of policies depended on three important factors; exposure (the probability of being in contact with a potential source of infection during work activity), proximity (the intrinsic characteristics of work activity that cannot guarantee adequate social distancing) and aggregation (the condition linked to work activities that may determine contacts with people other than co-workers). It is therefore essential and fundamental that the entire proposed framework is included in a coherent manner in all epidemic containment policies, with special reference to specific measures to prevent the emergence of new epidemic outbreaks (Javicles et al., 2021) (Fu et al., 2023)

It is therefore essential that any policy framework adopted in Italy for the management of the COVID-19 pandemic, especially in the post-lockdown phase, coherently integrates these three critical factors: exposure, proximity and aggregation. Effectively including these elements in containment strategies not only helps prevent the spread of the virus, but also mitigate the risk of new epidemic outbreaks

Countries' public policies, which were applied to deal with infectious diseases similar to coronavirus disease 2019 (COVID-19) may have different levels of rigor to reduce the negative impact of the pandemic in terms of a high number of infections and deaths. In particular, the responses of the governments of countries that used policies to deal with COVID-19 had a high degree of rigor, such as a long period of total confinement and quarantine, general travel bans at the national and international levels, mandatory use of masks indoors and outdoors, and impositions on the movement of people that reduce public and private life in society. (Cooking, 2023) (Cooking, 2023)

A holistic and multidisciplinary approach is required that balances workplace safety with economic and social needs, while ensuring that prevention measures are adaptive and specific to different work and social contexts. The implementation of these detailed and well-informed policies is crucial to protect public health without compromising the continuity of essential activities and economic recovery.

For the rigor of policy responses to face the COVID-19 pandemic crisis can be measured with a combination of different indicators that are aggregated in the rigor index, which is processed by the Oxford Coronavirus Government Response Tracker project. In this perspective, they suggest that lower rates of infections and mortality are linked to stricter compliance policies and severe penalties for non-compliance with control measures. Both pieces of information highlight a delicate balance between the rigor of restrictions and respect for individual freedoms, and raises the need for a detailed evaluation of policies to determine the optimal level of restriction that maximizes effectiveness in containing the virus without imposing unnecessary burdens on society. Ideal strategies might require an adaptive and context-specific approach, taking into account both epidemiological data and social and economic impacts. Hale et al (2021) Mahmoudi & Xiong (2022)

In Peltzman's theory. Indeed, strict policy responses and large vaccination campaigns can certainly help reduce the risk of severe effects from COVID-19, but Peltzman's theory suggests that when similar safety measures are implemented in society, people tend to increase their risky behaviors. This social behavior may be due to people having a lower perception of risk of becoming infected, so people make riskier choices and have risky behaviors that increase the spread of viral agents, especially new variants that spread more easily, generating high numbers of infections and mortality rates related to COVID-19. (Khandia et al., 2022, Hagger & Hamilton, 2022) Thus, Peltzman's theory predicts that strict safety measures for the COVID-19 pandemic crisis (e.g., extensive containment policies against COVID-19 and mandatory vaccinations) may yield a smaller benefit than expected because strict control measures are offset by increases in the risky behavior of people in society (Coccia, 2022)

With respect to actual levels of readiness to rapidly implement testing strategies and allocate testing capabilities across different regions, policymakers face a number of planning challenges. First, testing resources may naturally be limited at the beginning of a new disease outbreak, as testing technologies are still being developed (Bertrand & Pereira, 2022; Orji et al., 2023). Another important factor is distribution times, test administration times, and the number of trained personnel available to perform the procedure and interpret the results, which can also contribute to limiting the ability to effectively allocate mass testing capacities (Shrivastav et al., 2023). In addition, in the context of the COVID-19 outbreak, decisions to control the spread of the pandemic highlight that policy decisions must consider specific attributes of the disease, such as the high rate of transmission among asymptomatic people and the impact of population mobility. (Cataño-López et al., 2023). Finally, a major challenge for policymakers to allocate limited control resources across regions is to ensure an equitable distribution of these resources. Therefore, a great challenge is to ensure an equitable distribution of control resources, essential to mitigate disparities and improve health outcomes. In this perspective, Abdin et al (2023) despite the fact that there is little consensus on the meaning of equity, it is widely accepted in public health that an equitable allocation of resources helps mitigate disparities and improve health outcomes between regions.

An effective and equitable disaster management and preparedness strategy is not only based on the nature and severity of the disaster itself, but also on the specific vulnerability of the communities impacted by it. Although public health disasters such as the COVID-19 pandemic do not in themselves generate inequalities in access to health, they do exacerbate existing ones and cause a more severe impact on vulnerable communities (Alberti et al., 2020). Therefore, the development of equitable management and preparedness strategies must consider both the intensity of the disaster and the vulnerability of the communities involved.

METHODOLOGY

Literary review design, Hernández & Mendoza (2018), the analysis of literary criticism refers to recorded facts, such as bibliographic or newspaper sources, based on observations of facts or customs, with conclusions interpreted and published in argumentative form.

The type of research is documentary and, according to Bernal (2012), this study is a review of qualitative and quantitative data from primary research, which facilitates the operationalization of the information collected through exhaustive searches on various digital scientific platforms (Wos and Sciendo Direct). Research in countries around the world examining internal controls in public institutions also focuses on the assessment, design, implementation, or improvement of internal controls in public institutions.

The search in the two databases identified 1040 records from the Scopus, Wos and Scielo satos database. After that, inclusion and exclusion criteria were implemented, resulting in the selection of 540 articles. After reviewing the title, abstract, and keywords, only articles that met only one of the inclusion criteria were accepted, leaving 164 articles. Finally, 25 articles were used to obtain an answer to the objective of the study. These studies described the impact of public policies on hospital management during health crises.

Although there has not been as much research and case studies in healthcare industries compared to other industries, there is a clear trend where technology-driven approaches to SCM have been implemented in healthcare during pandemics.

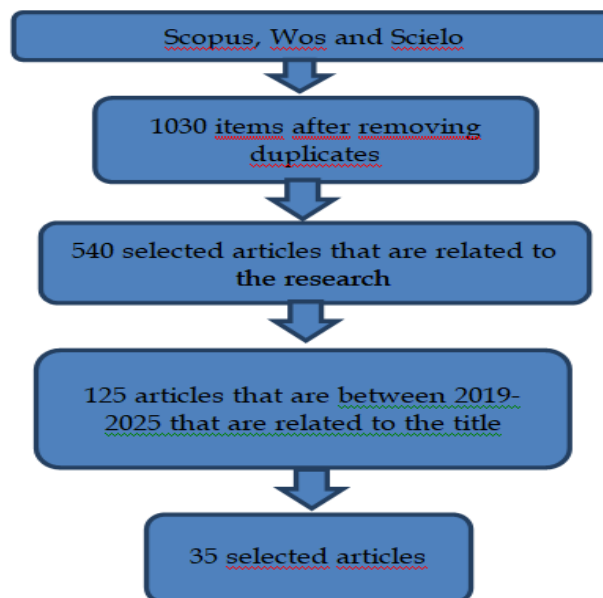


Figure 1. Data collection
Source: Own elaboration

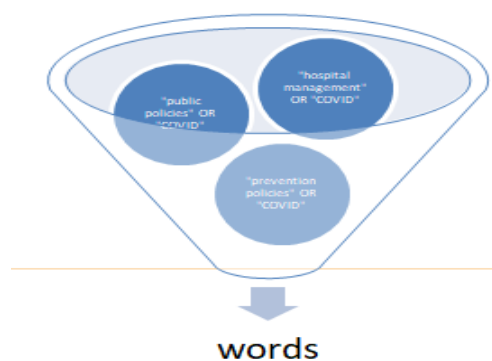


Figure 2: Keywords

RESULTS AND DISCUSSION

Several studies were analyzed, for example, Coccia (2023) showed that public policies of restrictions and mandatory measures to deal with the COVID-19 pandemic may be a necessary but not sufficient strategy to reduce the negative impact of the new coronavirus on society because there are multiple social, institutional, and environmental factors that support the spread of infections and the level of mortality of this pandemic

Contributions of the articles	Aspects evaluated
Containment policies sought to limit the spread of the virus within hospitals and in the community. Isolation practices, the use of personal protective equipment (PPE), and disinfection protocols were established. In addition, education and public awareness campaigns were implemented to prevent the spread of the virus (Abdin et al., 2023; Aburto Morales et al., 2020)	Containment and Prevention
During a past health crisis, hospital resources, such as beds, medical equipment, and staff, were limited compared to existing demands. Public policies focused on prioritization strategies and resource allocation, ensuring that the most critical patients received care first. This included the creation of triage protocols and the temporary expansion of hospital capacity. (Alberti et al., 2020; Amate-Fortes & Guarnido-Rueda, 2023; Bargain & Aminjonov, 2020)	Prioritization and Resource Allocation
An effective response required seamless coordination between different levels of the health system, as well as between the health sector and other government entities. This included collaboration on information sharing, capacity planning, and supply distribution (Czeisler, et., al, 2020; Dascalu, 2021; Roziqin et., al, 2021).	Collaboration and Coordination
The health crisis accelerated the adoption of telemedicine. The policies encouraged the use of digital technologies for remote consultations, reducing pressure on physical facilities and minimizing the risk of contagion.	Telemedicine and Technology
Implementation of Social Distancing Measures: Countries such as the United States, Italy, and Spain implemented strict social distancing policies, closures of non-essential establishments, and mobility restrictions (Rhee, et., to 2022; Najjar; 2020). Cost-Benefit Analysis: In Germany and South Korea, detailed assessments of the financial implications of distancing measures were conducted, balancing them with the benefits in terms of public health (Glanz et., al, 2022; Hate et., al, 2021; Jamison et., al, 2021)	Balance in Preventive Public Policies
Singapore and Taiwan underwent continuous monitoring and policy adjustments, where tracking systems and technology were used to collect data in real-time, which allowed them to quickly adjust their policies according to emerging needs (Bertrand & Pereira, 2022; Busse et al., 2022; Bustamante Izquierdo et al., 2023; Cataño-López et al., 2023; Chen et al., 2023; Chen et al., 2022) In Canada and Australia, Public Health strategies were optimized: they applied optimization models to determine the implementation of policies at different times, based on updated data and observations (Chewning et al., 2020; Chirico et al., 2023; Coccia, 2022).	Data-Driven Feedback Policy
United Kingdom and France, a maintenance of stability in the Policies was carried out: for example, they maintained stability in their policies of confinement and restrictions, providing predictability to the population and economic sectors (Lavicoli et., al, 2021; Khandia et., al, 2022; Mahmoudi et., al, 2022). Brazil and India generated a Dynamic Response to Uncertainty where significant challenges were faced due to the changing nature of the pandemic, which led to the adoption of more flexible and adaptive approaches in their policymaking	Challenges and Opportunities

Source: Own elaboration

In this context, (Jamison et al., 2021) argue that, in Europe, incentive-based non-pharmaceutical interventions produce positive effects to address the impact of the pandemic compared to mandatory rules and/or orders that

have a lower cost-benefit ratio.

Based on the findings obtained, an analysis of the effectiveness of the measures was carried out: Coccia's argument highlights the complexity of managing the pandemic, suggesting that solutions cannot be one-dimensional. Restriction policies, while effective in controlling mobility and reducing contact, may have limitations due to the specific socioeconomic, cultural, and environmental contexts of each region. These constraints may include public resistance to mandatory measures, difficulty of implementation in certain settings, and potential exacerbation of social and economic inequalities.

On the other hand, the perspective of Jamison et al. opens up the possibility that incentive-based interventions may offer a more balanced approach. These measures could include financial incentives to comply with public health guidelines, information campaigns that encourage voluntary and active community participation in prevention measures, and support for businesses and workers affected by the pandemic.

It is therefore suggested that an effective strategy might require a combination of restrictive policies and incentive-based approaches. Restrictions may be necessary at critical times to control rapid outbreaks, while incentives can sustain compliance and long-term cooperation. This combination could maximize effectiveness in reducing transmission of the virus, while minimizing negative impacts on society and the economy.

A study in Colombia analyzed an implementation model on a web platform (MathCOVID) for use by decision-makers to simulate the effect of policies such as confinements, social distancing, identification in the network of contagion and connectivity between populations. In addition, it was possible to evaluate the effects of migration and vaccination strategies as time-dependent inputs. Finally, the platform was able to simulate the effects of applying one or more policies simultaneously. the structure of the model could be adapted to other diseases (Catano et al., 2023).

CONCLUSIONS

advanced technological tools in the formulation of public health policies. This tool made it possible to simulate the impact of various policies, such as lockdowns and vaccination strategies, and evaluated their effectiveness in different scenarios, including connectivity between populations and migration. MathCOVID's ability to adapt to other diseases suggests its potential as a valuable resource in managing future health crises.

In countries like the United States, where the economy is largely based on the service sector, restrictions can have a disproportionate impact. Lockdown and social distancing policies, while essential to controlling the spread of the disease, can lead to business closures and unemployment. Therefore, it is

High restrictions and mandatory measures appear to be 100% effective in mitigating a high number of infections and deaths, as opposed to a high number of infections.

Health policies based on restrictions generate substantial economic and social costs and cannot be a useful response to contain the spread of health diseases such as the COVID-19 pandemic driven by the circulation of mutant viral agents in society

Crisis management preparedness in countries to deal with the impacts of the pandemic was poor, but it could be improved with good governance and greater access to new technologies

The scientific community must support institutions and policymakers to improve crisis management best practices to deal with upcoming pandemics.

Overall, therefore, these findings suggest an alternative public health crisis management policy, to face the next pandemic crisis, since an effective strategy is based on small restrictions, but not on totalitarian measures, another highlight is through better communication, especially good governance, generates high levels of investment in health infrastructures and in modern medical ventilator technology that can really do against the negative effects of future pandemic threats from new viral agents, when effective drugs are lacking.

Given that air pollution has recently been documented as a risk factor, due to the pandemic, the narrative on how to address it as a health problem is limited by insufficient acceptance of the health community, which is why there must be a multisectoral participation that must be substantially expanded towards a common national action agenda.

The COVID-19 pandemic was not in the 2025 disease targets, so public health and healthcare infrastructure has been rocked by COVID-19 with the threat of delaying and diluting progress. Epidemiological viral disease treatment regimens and services took an unwarranted hit due to unprecedented lockdowns and radically changed lifestyle patterns, similar to the increased risk of contracting this virus. It is important to address the deficiencies in the policy framework to protect the population, particularly children, adolescents and young adults, so public policies must be directed at risk factors that can generate great consequences after people have suffered the pandemic, which are such as tobacco consumption, alcohol consumption, unhealthy diets, including inadequate food and physical conditions.

A number of SEIR-type models were created using a structure that combines contact probabilities for heterogeneous populations, quarantine, free-flowing flows, and diffusion systems that describe the dynamics of death and recovery. As in the case of Colombia, they implemented the web platform model (MathCOVID) in

2020 to identify epidemic dynamics and evaluate the effects of control strategies. Therefore, SEIR models, which include probabilities of contact for heterogeneous populations, quarantine and free movement flows, are useful tools in the identification of epidemic dynamics and in the evaluation of control strategies, as demonstrated in Colombia with the MathCOVID platform.

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