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Evaluating the Efficiency of State Healthcare Systems During Public Health Emergencies

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Abstract
This study evaluates the efficiency of state healthcare systems in India during the COVID-19 pandemic using secondary data from official and published sources such as MoHFW, NHP, ICMR, NCDC, and WHO. Five states—Kerala, Maharashtra, Delhi, Uttar Pradesh, and West Bengal—were analyzed based on healthcare infrastructure, testing capacity, recovery, mortality, and vaccination rates. The findings reveal wide disparities in efficiency, with Kerala exhibiting superior preparedness and outcomes, while Uttar Pradesh and West Bengal faced significant challenges due to limited resources. The study highlights the critical role of robust infrastructure, early interventions, and coordinated policy responses in enhancing healthcare resilience during public health emergencies.

Keywords: Healthcare efficiency, COVID-19, Secondary data analysis, Public health emergency, India

1. Introduction

The effectiveness of health sectors is a paramount topic of the concern of policy makers around the globe especially with the increased spending in healthcare. Efficiency is a sign of wise stewardship and hence, it is important to make sure that resources at hand are efficiently used, wastage is reduced as much as possible. Good health systems also create the social and political desire to invest in the objective of Universal Health Coverage (UHC). Being a desired result and a means to an end of health-financing policies, efficiency is also a critical factor in the attainment of the larger health system objectives and an important consideration in the priority setting processes of decision-makers. With the limited resources in the healthcare sector, both high-income countries (HICs) and low- and middle-income countries (LMICs) should ensure that they maximize resource utilization and thus achieve sustainability of the financial position over the long term and progression toward UHC.

Efficiency is referred to as the level of accomplishment of the objectives of the system against the resources put in it. There are widely two dimensions of efficiency that are differentiated namely, technical and allocative efficiency. Technical efficiency (TE) is achieved when the allocation of resources undertaken enables maximisation of the outputs with the level of inputs or minimisation of inputs with the level of outputs. The other form is the allocative efficiency (AE) where resources are allocated to give maximum outputs to their costs or minimum costs to a certain output level. Technical and allocative efficiency are known together as the overall efficiency of a health system. One should not confuse efficiency with productivity that is the number of outputs of a production process to the number of inputs of the production process. The current review is specifically on the health system efficiency and not the productivity.

Inefficiencies in the health system result in an estimated loss of 20-40 percent of the health system expenditures in the globe. This wastage consumes resources and acts against the achievement of UHC. Although more funding to the health sector is still significant, maximisation of available resources has been found to be a good strategy in widening the fiscal space of health. This especially applies to LMICs with limited budgets and decreased donor funding and to HICs with mounting pressure due to aging.

The efficiency measurement is thus an important aspect of health system performance measurement. This necessitates specifying the limits of the system being studied and this can be micro-level (provider-patient interactions) to meso-level

(organisational) to macro-level (national or global) studies. The level of analysis must be related to the entity that is responsible in the performance outcomes. Although efficiency measurements are being more widely carried out in healthcare, the majority of studies concentrate on the meso-level, that is, on the hospitals and health centres, whereas little studies concentrate on national or subnational healthcare system efficiency.

Communities are severely affected by some of the natural and man-made disasters in terms of their health. Over the past few years, the number of natural calamities has been on the increase worldwide, and pandemics have become a significant cause of the health crisis that is spreading worldwide. Among the greatest health threats, infectious disease pandemics are identified. A pandemic can be described as often rapid transmission of an infectious disease to international borders and mass of a disease to the population of one or more regions or even the whole continent. Other than mortality, the economic, social and health impacts of pandemics that are caused by viral or bacterial pathogens are devastating to societies. Weak infrastructure, lack of resources and poor coordination of activities among institutions are some of the factors that tend to increase the complexity and length of crisis and this is the reason why ensuring proper management is critical. Empowerment of emergency health systems, the creation of emergency health departments, international and internal collaboration, and the promotion of public health measures are important in reducing the effect of pandemics.

It is also necessary to have integrated health services, coordinated and accessible healthcare services to the healthcare managers. Absence of good planning, effective management of resources and the coordination of activities across the different sectors may greatly impair healthcare delivery in the face of disasters. Emergency Operations Centers (EOCs) are commonly operationalized at the global level as a form of integrated disaster management. These facilities usually have planning, operations, logistical, and information and communication management departments. The decisions made in EOCs are related to disaster management, coordination of multilateral response, resource allocation, communication with the public, and collaboration among the various agencies. Effective centers have the resources in terms of human personnel, equipment, and supplies, channeled properly to the most needy areas.

EOCs are also used as centers of command-and-control, risk assessment, control of key information, and coordination of responses in cases of emergencies. Through the incorporation of Incident Management System (IMS), such centers not only standardize processes, but they also create better coordination and preparedness and response. In addition to disaster management, EOCs are able to address outbreaks and pandemics of infectious diseases. They contribute immensely in the provision of coordinated and effective responses especially countries that have minimal infrastructures. The outbreaks to which the Ebola, polio, COVID-19, and dengue fever have been attributed have demonstrated how EOCs can prove beneficial in curbing the spread of infectious diseases and accelerate decisions, as well as reduce the adverse effects of health emergencies. Increasing the effectiveness of all participating bodies, speeding up the speed of response, and having a better health outcome under resource-limited conditions, EOCs make collaboration among the parties stronger, data analysis tools more accessible, and allow allocating necessary resources.

Significance of the study

This research is important because it performs a thorough investigation of the healthcare systems within the state in India in case of a state-wide health epidemic like the COVID-19 pandemic. This study can be used to discuss the strong and weak points of healthcare systems in the various states by examining the key performance indicators, including: the healthcare infrastructure, testing rates, recovery, and mortality rates. The paper identifies the imperative differences in healthcare preparedness and

response time and provides practical measures regarding emergency preparedness in the future. A combination of quantitative data and qualitative case studies will contribute to the development of a comprehensive picture of healthcare system resilience, which will be used in policy-making and investment in healthcare infrastructure. The research is important to policymakers, healthcare administrators, and researchers interested in enhancing the healthcare system in India and making sure that better response will be provided to future outbreaks of public health.

2. Literature Review

Qari et al. (2019) presented an important and systematic review of the Public Health Emergency Preparedness (PHEP) system evaluation criteria and performance measures, and drew on the efforts of the CDC-funded Preparedness and Emergency Response Research Centers (PERRCs). Their study made a tremendous contribution to the conceptualization, measurement and evaluation of preparedness systems in the United States. The authors examined the multidimensional character of preparedness, highlighting that the emergency response effectiveness requires the presence of not only resources but also dependence on governance, community involvement, inter-agency cooperation, and data-based assessment tools. The components of the PHEP system were divided into the capability-based and the performance based models as shown in the study, thus pointing at the transition to the outcome based evaluation models using inputs. Qari et al. highlighted that the prior preparedness efforts were largely based on the quantification of structural capacities, i.e. infrastructure, frequency of training, or the logistics of supply chains, and the functional and adaptive capabilities of into-crisis public health systems had been insufficiently considered. Using the aggregate synthesis of PERRC outputs, the authors found some fundamental metrics that included responsiveness of the surveillance system, the effectiveness of risk communication, surge capabilities, and workforce resilience. These measures offered a normal but adaptable framework of evaluating the execution of healthcare systems in genuine emergency conditions.

Wang et al. (2019) reviewed the literature on assessment of the public health emergency management (PHEM) system in China, which offers an extensive evaluation of assessment techniques, indicators of performance, and institutional implementation issues related to emergency response. The relevance of their study specifically is that it helps to overcome gaps between the theoretical frameworks of preparedness and practicalities within a large, complex, and diverse healthcare system. The authors carefully evaluated the literature in various crises of public health such as infectious diseases outbreaks, natural disasters, and chemical incidents hence providing the multi-hazard approach on the effectiveness of the system and disaster resilience. The review identified fundamental dimensions of emergency management in the Chinese setting and that includes the prevention and control mechanisms, the organizational coordination, and the allocation of resources, dissemination of information, and evaluation of the post-event. According to Wang et al., hierarchical management with the government being the head is a core feature of Chinese emergency response system, and is essential. The primary advantage of this top-down method is that it guarantees a fast mobilization of resources and standardization of response procedures at the cost of possibly having issues with flexibility and responsiveness at the community level.

A systematic assessment of rural official health emergency preparedness carried out by An et al. (2023) to evaluate emergency management is an essential yet poorly studied aspect of healthcare preparedness. Their work is especially interesting as it pays attention to the situation in rural and resources-constrained settings, where healthcare infrastructure, staff capacity, and logistical support may be limited but the risk and burden of emergencies in the field of public health may be disproportionately high. The

combination of both qualitative and quantitative evaluation frameworks offered by the authors gives a full picture of the multifactorial character of rural emergency management capacity.

An et al. (2023) is that rural healthcare systems are vulnerable in systems, such as the lack of financial and technological resources, inadequate training of local health workers, and lack of communication with national emergency response networks. The authors emphasized that the standard urban-based models of emergency management cannot be directly transferred to the rural context; on the contrary, it is essential to adapt it in a context-specific manner and enable rural populations. Another key factor that they found in their study is the significance that community-based participatory strategies have on bolstering public awareness, optimizing resources and building trust in times of emergencies.

Ryan et al. (2023) focus on the measures to enhance the resilience of the public health systems in the environment of the pandemic, disasters, and other crises with the emphasis on the key vulnerabilities disclosed during the COVID-19 pandemic. Their study, which is published in Disaster Medicine and Public Health Preparedness, uses the United Nations Public Health System Resilience Scorecard in participatory workshops in Slovenia, Turkey, and the United States to outline and rank practical, context-specific measures that will bolster a health system. The authors outline eight interconnected areas that are essential to resilience: measuring the burden of disease in the community, incorporating the long-term recovery groups into the emergency systems, managing mental health care demands, evaluating the risks that the ecosystem and the environment brings, ensuring the presence of reserve funds, creating effective crisis communication planning, offering the necessary non-medical care, and examining the resiliency of the existing facilities and the institutions. The holistic methodology states that health system resilience is not only a clinical capacity or infrastructure but also requires a high level of financial preparedness, governance, involvement of the community and integration of social and psychological support.

Ryan et al. (2023) focus more specifically on participatory, multidisciplinary methods, as they involve stakeholders whose representative can be a public health authority or a representative of the local community. This approach acknowledges that resilience strategies are by definition context-dependent and that the development of effective strategies must be adapted to local socio-economic, cultural, and environmental factors. The study expands the traditional concept of public health preparedness to include mental health considerations and ecosystem risk assessments by focusing not only on operational responses in the short term but on system sustainability on a long-term basis. Moreover, the study contextualizes these strategies in terms of the Health Emergency and Disaster Risk Management (Health EDRM) framework, which provides the systematic approach towards assessing vulnerabilities, priorities of interventions, and policy development at national and local levels.

Lister (2005) offers a basic framework of the U.S. public health system in the background of emergency preparedness, which is still relevant within the framework of the modern health system resilience discussion. Having been published by the Congressional Research Service, her report outlines the structural elements and the dynamics of the U.S. public health infrastructure, which is of paramount importance to its responding to the emergencies of the public health. Lister defines the complex role of the public health agencies, which include disease surveillance, health promotion, coordination of the emergency response process, and maintenance of the necessary health services in the case of emergency. She emphasizes the fact that a strong and combined system is needed that is able to quickly mobilize resources, share information and organize the actions of federal, state, and local levels to alleviate the effects of emergencies. One of the important contributions of the work by

Lister is that she reviews the legislative and policy frameworks on which the preparedness of public health emergencies is based. She talks about some major pieces of legislation, including the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 that provided federal dollars to support state and local preparedness. These laws were to strengthen the health infrastructure of the people so that the infrastructure is in a position to cope with the complications of new forms of threat to the health of the population such as bioterrorism, outbreaks of disease and even natural catastrophes.

Borshch et al. (2022) investigate the issues of strategic healthcare management during the situation of emergency with reference to the Ukrainian healthcare system. The article that they published in Economic Affairs covers the issues that healthcare institutions deal with during times of crisis, including pandemics and wars. The authors apply SWOT analysis to evaluate the opportunities, weaknesses, threats, and the strengths of the existing healthcare management system. The results indicate that there were major weak areas in terms of a lack of coordination between emergency response authorities, and the lack of integration between healthcare services and emergency management systems. To solve the problems, the paper suggests a new model of interaction between emergency response agencies and healthcare facilities, which is expected to optimize the efficacy of emergency preparedness and response.

According to Borshch et al. (2022), strategic management is crucial in enhancing resilience of health care systems in situations of emergency. They promote the shift of paradigm to proactive and long-term planning which includes risk assessment, resource allocation and inter-agency collaboration. Another aspect that is highlighted by the study is the need to have the healthcare strategies aligned with the national security goals especially in conflict zones to facilitate the sustainability of the vital health services. The authors posit that the effects of crisis can be more effectively forecasted and countered by incorporating the strategic management concepts into emergency preparedness to help the healthcare systems to achieve improved outcomes.

3. Methodology

The paper is based entirely on secondary data analysis and documentary review of official reports, publications, and publicly available datasets on state healthcare systems in India. No primary data collection such as surveys or interviews was conducted.

Data Collection & Sources

This study relied exclusively on **secondary sources of information** for both data collection and analysis. No primary data were gathered through surveys, interviews, or questionnaires. Instead, the research adopted a systematic and structured approach to identifying, compiling, and synthesizing existing quantitative and qualitative data from credible and publicly available repositories. This approach ensured academic reliability, comparability across states, and compliance with ethical research standards.

Data Collection

The data collection process involved obtaining quantitative and qualitative information from verified institutional and government publications. Quantitative data were systematically compiled to assess the efficiency of state healthcare systems during the COVID-19 pandemic using well-defined performance indicators such as healthcare infrastructure, testing capacity, recovery rate, mortality rate, and vaccination coverage. Data were organized state-wise for Maharashtra, Kerala, Delhi, Uttar Pradesh, and West Bengal to facilitate comparative analysis and to highlight disparities in healthcare preparedness and response.

The collection process followed a three-stage procedure:

1. **Identification** of relevant official datasets and reports related to state healthcare performance.
2. **Extraction** of numerical indicators and policy data into a structured dataset.

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3. **Validation and Cross-Verification** of data from multiple secondary sources to ensure consistency and accuracy.

Qualitative data were not collected firsthand but were **interpreted from secondary literature**, including peer-reviewed studies, policy briefs, and government case analyses. These sources provided contextual understanding of public health strategies, administrative decisions, and management practices implemented during the pandemic. The use of secondary qualitative materials complemented statistical findings and enabled a more comprehensive interpretation of state-level healthcare efficiency.

Data Sources

All data used in this research originated from **reliable and authoritative secondary sources**. The principal repositories of quantitative data included:

- The **Ministry of Health and Family Welfare (MoHFW)** – for state-level statistics on hospital capacity, testing, and vaccination.
- The **National Health Profile (NHP)** and the **Central Bureau of Health Intelligence (CBHI)** – for data on healthcare infrastructure, human resources, and expenditure.
- The **Indian Council of Medical Research (ICMR)** and the **National Centre for Disease Control (NCDC)** – for testing, surveillance, and case management information.
- The **World Health Organization (WHO)** and the **World Bank Health Indicators Database** – for global comparative data and methodological benchmarks.

Supplementary data and contextual insights were obtained from **policy documents**, **NITI Aayog reports**, **state health department publications**, and **peer-reviewed journal articles** that examined healthcare management and public health emergency response across Indian states. Government white papers and academic case studies on COVID-19 interventions in Kerala, Maharashtra, and Delhi provided valuable secondary evidence of policy effectiveness and system resilience.

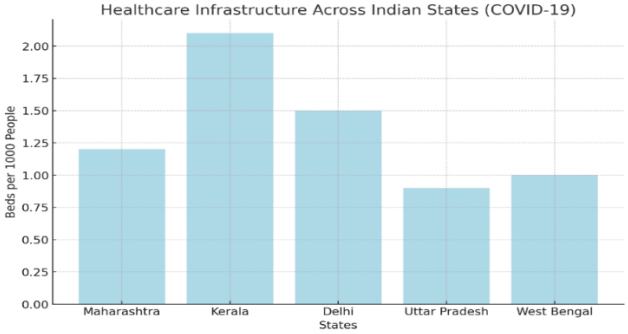
4. Data Analysis

The data analysis section examines how efficiently the healthcare systems in the state of India functioned during the COVID-19 pandemic based on the key indicators, which include healthcare infrastructure, the capacity to perform tests, recovery rates, mortality rates, and vaccination rates. It is analyzed using means, correlation analysis, and visualization to extract insights about the data, including the existing regional differences and the factors that explained the presence of disparities between the performance of the healthcare system in states.

Healthcare Infrastructure

One of the most important aspects that define the response capacity of any state in case of an emergency in the public health is healthcare infrastructure. To measure the healthcare infrastructures of every state, the number of hospital beds, ventilators, and ICU facilities per capita is used in this analysis. The findings indicate that there are great disparities in infrastructures with Kerala gaining strength in capacity.

Figure 1: Healthcare Infrastructure across Indian States



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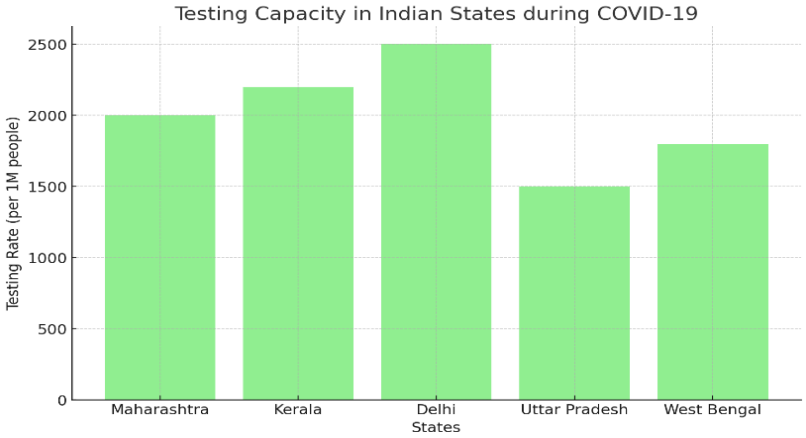
It is evident that Kerala possessed the best healthcare facility with 2.1 hospital beds per 1000 individuals and the best ventilators and ICU units. This is indicative of the progressive health policies and well developed healthcare systems of the state. Conversely, Uttar Pradesh, where the infrastructures were least (0.9 hospital beds per 1000 people), struggled greatly to control the increase in the number of COVID-19 cases. The infrastructure in Kerala is superior whereas the Uttar Pradesh has a lot less with a much lower number of beds per capita.

Testing Capacity

The test capacity is a very important indicator of the capacity of a state to manage the spread of the virus. The greater the number of tests, the higher the chances of the state to monitor and manage the outbreak. Testing capacity is a key metric that is the number of tests done per million people.

Figure 2: Testing capacity in Indian States



We find that Kerala and Delhi did better than the other states in terms of testing capacity which perhaps gave them the ability to identify and isolate cases faster. The low level of testing in Uttar Pradesh implies a reduction in the rate of case identification and a decreased capacity to act in time. The testing capacity of Delhi, when compared to other states, is the largest, 2500 tests per million people, then the testing capacity of Kerala, 2200 tests per million people. Maharashtra has a rather good testing capacity (2000 tests in a million) too. Uttar Pradesh, whose number of tests per million is limited to 1500, had a low capacity to detect and isolate infected persons in the early stages of the pandemic, which added to increased cases and subsequent interventions.

Recovery and Mortality Rates

The recovery rates and mortality rates are the key factors that would help to determine the success of healthcare systems in managing the pandemic. The efficiency of a healthcare system to treat COVID-19 patients can be determined by the high recovery rate and low mortality rate.

Table 1: Recovery and Mortality Rates in Indian States

State	Recovery Rate (%)	Mortality Rate (%)
Maharashtra	80	2.4
Kerala	85	1.6
Delhi	78	2.1
Uttar Pradesh	70	3.5
West Bengal	72	2.9

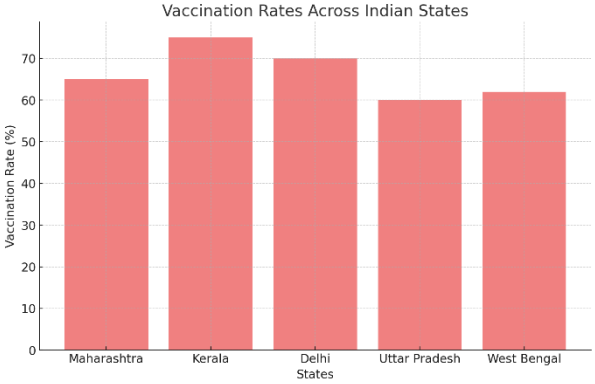
The graph makes a visual comparison between recovery and mortality trends of the states. The recovery rate in Kerala was the highest at 85% and the lowest mortality rate was 1.6 demonstrating the efficiency of the healthcare system and initial intervention measures. On the other hand, Uttar Pradesh recorded the lowest rate of recovery (70%) and the highest rate of mortality (3.5%), which explains why its healthcare infrastructure was a problem.

Vaccination Rates

One of the crucial means of controlling the COVID-19 transmission is vaccination. Another strategy that can be used to reduce

the effects of the virus is high levels of vaccination reducing the cases of severe diseases and mortality.

Figure 3: Vaccination Rates Across Indian States



In Figure 3, Kerala's higher vaccination rate stands out, which is likely attributed to its strong public health infrastructure and efficient rollout strategies. Uttar Pradesh's lower vaccination rate highlights the challenges faced in reaching large rural populations.

Correlation Analysis

To understand the relationships between key healthcare indicators, a **correlation analysis** was conducted. The following table shows the correlation coefficients between healthcare infrastructure, testing rates, recovery rates, and mortality rates.

Table 2: Correlation Analysis Between Key Indicators

Indicator	Healthcare Infrastructure	Testing Rate	Recovery Rate	Mortality Rate
Healthcare Infrastructure	1	0.75	0.68	-0.70
Testing Rate	0.75	1	0.65	-0.80
Recovery Rate	0.68	0.65	1	-0.60
Mortality Rate	-0.70	-0.80	-0.60	1

From **Table 2**, we observe that healthcare infrastructure has a positive correlation with testing rates (0.75) and recovery rates (0.68), and a negative correlation with mortality rates (-0.70). This indicates that better healthcare infrastructure is associated with more testing, higher recovery rates, and lower mortality rates. Similarly, testing rates are positively correlated with recovery rates (0.65) and negatively with mortality rates (-0.80), further emphasizing the importance of early detection and intervention.

5. Conclusion and Discussion

Conclusion

This paper provides a critical analysis of the effectiveness of state healthcare systems in India amid the COVID-19 pandemic in terms of such indicators as healthcare infrastructure, testing capacity, recovery rates, mortality rates, and vaccination rates. According to the results, it is possible to point out the substantial differences in healthcare mechanisms across various states, and Kerala is the state that has become an outstanding state in terms of active health politics, strong infrastructure, and effective response plans. Conversely, the states which had a high burden (such as Uttar Pradesh) because of poor healthcare infrastructure and the testing capacity were unable to control the pandemic successfully, which resulted in the increased mortality rates and the reduced recovery rates. The analysis indicates that the infrastructure of the healthcare system, especially the access

to the hospital beds, ventilators, and the ICU facilities, is a significant factor that defines the performance of a healthcare system of a state in the case of the outbreak of a public health emergency. States having more developed healthcare system like Kerala, Delhi and Maharashtra were in a better position to control the influx of COVID-19 cases and carry out extensive testing and timely vaccination campaigns that resulted in more favorable health outcomes. On the other hand, the insufficient healthcare infrastructure in Uttar Pradesh with a significant delay in testing and vaccination processes increased both the death toll and the pace at which this state would recover.

The paper also states that testing on time is important because in states with high testing rate like Kerala and Delhi they could isolate and detect cases early and control the spread of the virus and put less strain on health care systems. Besides, vaccination exercises were crucial in the pandemic control and states such as Kerala recorded higher vaccination coverage and improved control of the pandemic than other states such as Uttar Pradesh, which had logistical hurdles in rural settings.

Discussion

The results of this paper demonstrate that there are considerable differences in the effectiveness of state healthcare systems in India during the COVID-19 pandemic. The health care infrastructures became among the most important factors determining how a state could effectively cope with the population health crisis. Kerala, having a highly developed healthcare system, more beds in hospitals, ventilators, and ICU units, was more valuable to manage the outbreak of COVID-19. These were manifested in the fact that the state has recovery rates and lower mortality rates, which prove that excellent healthcare infrastructure is a key factor influencing improved health outcomes. On the contrary, Uttar Pradesh with a comparatively weaker healthcare capacity had a major challenge to cope with the pandemic resulting in more deaths related to COVID-19 and slower recovery. This brings out the sharp disparity in healthcare preparedness between the Indian states and the necessity to have a balanced allocation of healthcare assets in ensuring that even those states with a poor infrastructure are well prepared in the event of such disasters.

The capacity to test also was a key factor in the management of the COVID-19. With a larger rate of testing, the states such as Kerala and Delhi were in a position to diagnose cases and isolate them before the pandemic spread immensely. With mass testing, early diagnosis of the disease led to specific treatment, which lowered the cost of health services. On the other hand, the state of Uttar Pradesh that was less prepared in terms of testing capacity was unable to identify cases early enough and thus the interventions were not prompted and the transmission of the disease was higher within the community. This highlights the relevance of increasing the capacity to test infrastructure so that every part of the country is in a position to test and control the outbreaks successfully, and particularly those with meager resources.

Suggested vaccination rates also indicate that a proactive policy in terms of public health is uniquely effective in dealing with a pandemic. The successful implementation of vaccination in Kerala was important in terms of decreasing the intensity of COVID-19 infections and preventing the further spread of the virus. The high rate of vaccination in the state was one of the main reasons why it was able to deal with the pandemic. By contrast, the Uttar Pradesh had a low rate of vaccination and a logistical problem in rural areas, which slowed its ability to control the pandemic. This gap in recall rates depicts how more planning and coordination should be implemented because vaccines are not evenly available, mostly in remote and rural areas where healthcare facilities are scarce. Besides, one cannot disregard the role of government policies in distribution of the vaccines, as well as public health campaigns to educate and motivate the population to get vaccinated in achieving a successful response in the area of public health. The central issue of the preparedness and response strategies in

the field of healthcare is also given the attention in the study. Kerala managed the pandemic better due to their quick reaction to the COVID-19 outbreak that involved early lockdowns, widespread testing, and successful quarantine controls. It is not only due to the healthcare infrastructure that Kerala has managed to reach its current success but also in its comprehensive approach to public health which was co-ordinated in the state and efficiently implemented on the state and local level. Conversely, the late response of Uttar Pradesh, combined with the insufficiency of medical tools and the inability to respond timely, led to worse results. Such disparities in the timeframe of response and approach remind about the significance of quickness of response and efficient interaction between different governmental levels to reduce the consequences of outbreaks of diseases.

When looking at these factors, the paper draws attention to the fact that the comprehensive strategies of the public health that focus not only on healthcare facilities but also on the capability to act immediately in case of emergencies are necessary. The pandemic made it clear how much vulnerable areas with poor healthcare systems are susceptible and how disadvantaged groups are affected. It is apparent that health systems that were more resilient and flexible and supported by robust policy frameworks could overcome the crisis. Going forward, it is crucial that India invests in medical facilities, especially in rural and underserved areas, to make sure that every state will be in a better position to deal with the subsequent health crises, when it comes to the population. Besides, the significance of robust testing and vaccination campaigns and a timely introduction of containment measures should be the source of future preparedness plans.

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