Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/jptcp.v30i19.3743

ASSESSING THE EFFICACY OF INDIA'S DISASTER MANAGEMENT SYSTEM AND THE INVOLVEMENT OF NON-GOVERNMENTAL ORGANIZATIONS (NGOS) AMID THE COVID-19 PANDEMIC.

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Abstract A disaster management system effectively coordinates information from various sources and collaborates with disaster response organizations to mitigate the adverse impact of disasters. The Covid-19 outbreak, declared a global public health emergency on January 30, 2020, presented a significant threat to countries with less-developed healthcare systems. India responded resolutely to this unprecedented challenge, with both governmental and non-governmental organizations providing support. This study assesses the performance of India's disaster management system during the Covid-19 pandemic, shedding light on areas of weakness in crisis management. These insights can serve as valuable lessons for fortifying the disaster management system to better handle future pandemics. Furthermore, the research emphasizes the role of non-governmental organizations in pandemic preparedness in India, utilizing primary data gathered through a sample survey conducted among these organizations. The findings were acquired through a structured questionnaire method.

Keywords: *Disaster Management, Pandemic, COVID-19, NGOs, Preparedness, Response, Vaccination.*

1. Introduction

The frequency and intensity of disasters are on the rise, impacting a larger number of individuals. This trend can be attributed to several factors, such as population growth, air pollution, poverty, climate change, and shifts in habitation patterns. These elements create conditions conducive to the transmission of infectious diseases, thereby increasing the vulnerability of humans. Consequently, there is a growing imperative on a global scale to prioritize the development of tools, protocols, and strategies for more effective disaster management. Effective disaster management entails the provision of technology, tools, and procedures that adeptly handle information from diverse sources and collaborate with disaster response organizations to preserve lives and mitigate the adverse repercussions of disasters. Simultaneously, governments and organizations must comprehend the specific disaster they are contending with, along with existing policies and practices for addressing

such crises, before they can enhance their disaster response capabilities effectively by incorporating new technology and techniques. Moreover, persistent challenges in disaster management, such as cross-border issues arising when disasters impact multiple countries, such as infectious diseases and pandemics, underscore the critical significance of having a robust plan in place prior to the onset of a disaster.

On January 30, 2020, the Coronavirus outbreak was officially declared as a global public health emergency, presenting a substantial threat to countries with inadequate healthcare systems. By March 11, 2020, COVID-19 had already reached 114 nations, resulting in 11,800 confirmed cases and 4,291 fatalities. This situation has profoundly transformed the landscape of humanitarian crises. Moreover, there is a growing concern among experts regarding the potential for COVID-19 to spread further, with the possibility of causing over 17 billion infections, particularly in South Asia, and leading to 7.6 million deaths if immediate action is not taken (Acharya & Parwal, 2020). In India, the COVID-19 pandemic was officially declared a disaster during the lockdown period, as stipulated by the Disaster Management Act of 2005 and the Epidemic Disease Act of 1897. In response to this, the Government of India developed a comprehensive National Containment Plan for COVID-19. This plan included measures such as early infection detection through screenings, community-focused primary healthcare for mild cases, specialized care for severe conditions, and an increased emphasis on public health education. India has also risen to the challenge presented by the unprecedented conditions of the COVID-19 pandemic, with support from both governmental and non-governmental organizations (NGOs). They have established facilities for preventive and therapeutic healthcare, backed research initiatives, and implemented tracking services to reduce the number of fatalities.

Non-Governmental Organizations (NGOs) play a crucial role in the readiness and response to pandemics, particularly when it comes to supporting disadvantaged and vulnerable populations. NGOs bring valuable experience gained from managing past pandemics, such as Ebola in Congo, Cholera in India, the Spanish Flu, and the Black Death in Africa. Whether the crisis is of natural or human-made origin, NGOs can have the most significant impact in areas such as healthcare, economic aid, education, and community-based surveillance. The primary focus of the Indian government was to assist the underprivileged by providing them with essential necessities such as healthcare and safety gear, while also raising awareness through campaigns on practices like handwashing, mask-wearing, and adhering to social distancing measures.

This study assesses the efficiency of the disaster management system in place during the COVID-19 pandemic. It identifies the shortcomings encountered in managing this crisis, providing valuable insights that can be used to reinforce the disaster management system for future pandemics. Furthermore, it emphasizes the role of non-governmental organizations (NGOs) in their readiness and response to this pandemic, as well as the collaboration between NGOs and the government. In the fourth section of this study, we outlined the four components of the disaster management system that played a part in addressing the COVID-19 situation in India. This included the government's response and their strategies for COVID-19 vaccination. The fifth section delves into the challenges faced while dealing with the pandemic in India, while the sixth section explores the contributions of non-governmental organizations and the significant impact they had in supporting the government's efforts to control the COVID-19 situation..

2. Review of literature

The global community is currently grappling with a COVID-19 pandemic, an unprecedented event that has significantly affected the lives and livelihoods of people worldwide. This outbreak has resulted in enduring and profound consequences on individuals, communities, and society at large, as highlighted by Panneer et al. in 2021. The World Health Organization (WHO) officially declared COVID-19 as a pandemic on March 11, 2020, as documented by WHO in 2020. This ongoing pandemic has given rise to both health and economic concerns, (McKee & Stuckler 2020). While pandemics have been a recurring part of human history, their characteristics, impact, and societal responses have evolved over time, as observed by Panneer et al. in 2021. The COVID-19 pandemic

has served as a comprehensive examination of all facets of human existence, spanning from healthcare systems to the broader social and economic landscape. Each nation has faced its unique challenges in responding to the pandemic, with only a select few managing to maintain open economies while simultaneously keeping infection and mortality rates at bay (Sundararaman et al. 2021). Examples of such nations include Sweden and South Korea, both of which made the decision to refrain from implementing strict economic lockdowns while focusing on safeguarding public health. However, the strategies employed by these two countries diverged significantly (Barhate et al. 2021). South Korea, for instance, placed a strong emphasis on contact tracing and virus elimination, leveraging its advanced healthcare system, high public awareness, and cutting-edge medical technology. At the same time, Sweden focused on maintaining its economy by relying on its high quality healthcare services and universal healthcare coverage (Barhate et al. 2021).[1]

India acted promptly in response to the COVID-19 pandemic, formulating a comprehensive Containment Plan. This strategy revolved around the early identification of COVID-19 infections through screening, providing primary healthcare facilities for individuals with mild cases, offering tertiary care for those with severe illnesses, and promoting population-wide health education to reduce infection rates and person-to-person transmission, as outlined by Ramachandran et al. 2020. During the second phase of the pandemic, the Government implemented rigorous screening and quarantine measures for all international travellers to curtail the spread of the virus from abroad, ultimately leading to the suspension of international travel, as documented by Ramachandran et al. in 2020. Additionally, the government enforced restrictions on gatherings for various purposes, including commercial, educational, entertainment, sports, religious, and social events (Ramachandran et al. 2020).

This approach aimed to minimize the spread of COVID-19 between cities, states, and urban-rural areas, as emphasized by Ramachandran et al. in 2020. Moreover, the nationwide lockdown afforded the country the necessary time to revamp its healthcare system, ensuring its capacity to handle the growing number of COVID-19 patients across all levels of treatment (Ramachandran et al. 2020). Additionally, the government enacted the National Disaster Management Act of 2005 , which delineates policies, plans, and guidelines for effectively managing the epidemic and ensuring a swift and efficient response to this crisis (Djalante et al. 2020). These guidelines encompass various aspects, including the nature of lockdown measures, disease containment strategies, recommendations for social distancing, testing approaches, contact tracing, and isolation methods (Djalante et al. 2020). It is noteworthy that the available literature does not provide a detailed account of how India navigated through the various stages of the pandemic. Therefore, gaining insights into the country's preparedness and responses at each stage of this crisis is of significant value. Furthermore, our study sheds light on the role played by numerous non-governmental organizations (NGOs) in India during this pandemic.

3. Methodology:

The research delves into the assessment of India's disaster management system's performance in the context of the COVID-19 pandemic. It involves a comprehensive descriptive and analytical investigation, aiming to assess the effectiveness of each facet within India's disaster management system, while also examining the contributions made by Non-Governmental Organizations (NGOs) in assisting the government in managing this crisis. The study unfolds in two distinct phases: the initial stage involves an in-depth description of the four key elements within the disaster management cycle, while the subsequent stage delves into an analysis of the roles played by NGOs in addressing the situation, the challenges they encountered, and their collaborative efforts with the government.To address this, we have undertaken the collection of primary data by conducting a sample survey analysis involving NGOs operating in India. The survey results were derived using a structured questionnaire approach. A total of 21 questions were formulated and distributed to 100 NGOs that actively operated and delivered their services during the COVID-19 pandemic. Additionally, we have gathered secondary data from publicly accessible sources, specifically from the Ministry of Health and Family Welfare (MOHFW), the World Health Organization (WHO), and various inter-

governmental organizations operating in India, covering the period from January 2021 to September 2022.

4. Results and discussion

4.1. State Government's action plan

At the state level, the readiness and response to COVID-19 have exhibited variations: (i)-The state of Kerala, drawing from its prior experience with the Nipah virus outbreak in 2018, has adopted an approach that involves extensive testing, contact tracing, and community mobilization to contain the virus. As a result, it has managed to keep the mortality rate relatively low. Furthermore, Kerala has constructed a substantial number of transitional housing units for migrant workers. (ii)- Odisha, on the other hand, already had crisis preparedness measures in place, which were further adapted based on its previous encounters with natural disasters. (iii)- Maharashtra has implemented a cluster containment strategy and deployed drones to monitor adherence to physical distancing measures during the lockdown period.

4.2. Canter Government's action plan

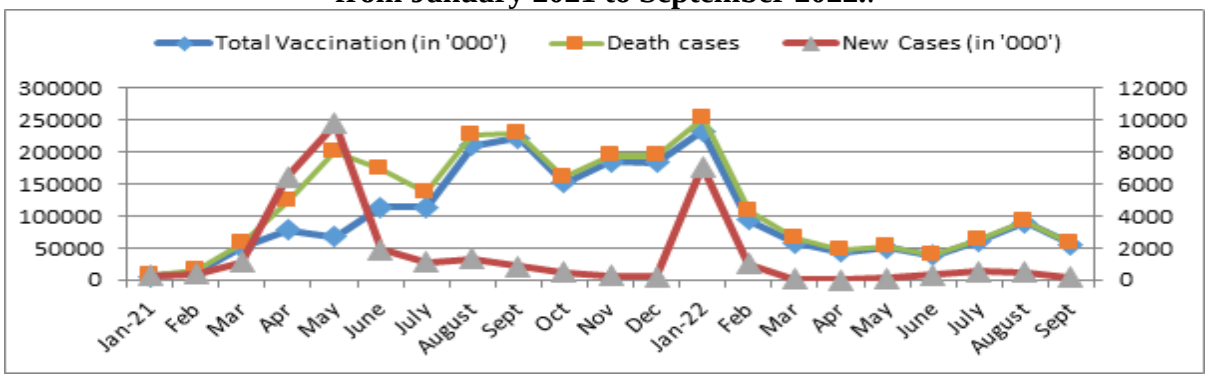
Geographical areas were categorized into three zones, namely red, green, and orange, based on the COVID-19 case counts. The red zone represented the hotspot among these zones, characterized by a high number of active cases. In contrast, the green zone encompassed districts that had reported no confirmed cases in the preceding 21 days, while the orange zone fell between the red and green zones, comprising areas with mild infection rates. Consequently, in the green zone, most activities were permitted due to the absence of reported cases. Meanwhile, in the orange zone, a partial allowance was made for both essential and non-essential activities, as outlined by Chauhan et al. in 2021

Numerous measures were undertaken in this context, encompassing an evaluation of the system's preparedness, the issuance of guidance to states and union territories concerning testing, diagnostics, surveillance, prevention, and control, as well as risk communication. The effort involved strengthening capacities for timely detection and case management. Furthermore, the Ministry of Health issued a directive titled "Help us to help you," which included the following actions: (i) Disseminating information via phone calls to educate individuals about recognizing symptoms and procedures for dealing with COVID-19. (ii) Enhancing awareness through informative videos about the significance of personal hygiene and maintaining cleanliness in society. (iii) Establishing toll-free helpline numbers in every state across India, under the ministry's purview, to provide information related to COVID-19, protective measures, vaccination information, and more. (iv) Launching Arogya Setu, a location-based mobile application that connects individuals to healthcare services.The app helps inform users about the potential risk of infection, best practices, and relevant medical advisories about COVID-19 pandemic containment.[2]

4.3. Vaccination strategy

Novel systems are under development to accelerate the production and equitable distribution of COVID-19 vaccines. India commenced the administration of free COVID-19 vaccinations on January 16, 2021, marking the initiation of what is anticipated to be the most extensive immunization campaign globally, as outlined by Kumar et al. in 2021. This vaccination process in India unfolds across three phases: In the initial phase (Phase I), the vaccine was provided to healthcare professionals, frontline workers, and individuals under the age of 50 who had underlying medical conditions. During this phase, the government administered vaccines from three manufacturers: Covaxin, Covishield, and Sputnik V. Phase II commenced on March 1, 2021, with a primary focus on safeguarding the most vulnerable population group, namely those aged 45 and above, who account for over 80% of the nation's COVID-19-related fatalities. Throughout Phase III, the government engaged in cooperation and coordination with research centers and commercial enterprises, leveraging the nation's prowess in vaccine production and introducing substantial enhancements to the country's drug and vaccine regulatory framework.

Figure 1: The cumulative vaccinations, new cases, and reported deaths within the time span from January 2021 to September 2022..



Source: Co-Win database and World Health Organization (2022).

Figure 1 provides an approximate representation of how the vaccination strategy has influenced the death rate and the number of COVID infection cases. The total vaccination and the count of newly infected patients are depicted in thousands, while the number of death cases is presented in actual figures. From the beginning of the data until May 2021, both new COVID cases and the number of deaths continued to rise. However, a declining trend becomes evident after May 2021. Subsequently, new cases continued to decrease from June 2021 to December 2021. Paradoxically, during this same period, the number of deaths exhibited an upward trend, despite the significant vaccination coverage. It's worth noting that most of the reported mortality cases were among older individuals and people aged 45 and above who had underlying medical conditions. One contributing factor to the high death rate might be delays in distributing vaccine doses to this age group. Moreover, the acceptance of and hesitancy towards vaccination among both the general population and healthcare workers played pivotal roles in effectively controlling the COVID-19 disease.

Since the commencement of the vaccination campaign, there has been a noticeable increase in the rate of vaccine doses administered (as depicted in Fig 1). These vaccinations are administered on a voluntary and cost-free basis. However, a decline in vaccination doses is evident in January 2022 (Fig 1). This decline coincided with a surge in infections caused by the new Omicron variant of the coronavirus, along with some hesitancy among the population regarding receiving precautionary doses. Notably, the majority of individuals who opted for preventive doses were healthcare workers, frontline workers, and those aged 45 and above. As the new coronavirus variant emerged, the effectiveness of vaccines became evident. While there were still cases of infection, the number of reported deaths was significantly lower. Additionally, booster doses were administered to individuals who had already received two doses, enhancing their immunity and reducing the number of cases. Consequently, after individuals had received their complete dosage, the number of new cases and fatalities remained low, maintaining this trend until September 2022. Primarily, people have placed their reliance on herd immunity and personal hygiene practices, rather than solely relying on face masks and social distancing. Although there were considerable mortality rates among the elderly and vulnerable populations due to the preference given to healthcare and frontline workers in the initial phase, the ample availability of vaccine doses in India has contributed to an efficient vaccination system.

5. The COVID-19 Challenges Faced in India

India faced numerous challenges in its response to the COVID-19 pandemic. One significant issue that placed considerable pressure on the country was the widespread lack of trust in the public health system, particularly in regions such as Uttar Pradesh, Bihar, and Madhya Pradesh, which are among the poorest states in India (Chetterje 2020). Additional notable factors included the stigma associated with individuals placed in quarantine, driven by a lack of public awareness about the disease and the fear of isolation (Chetterje 2020). The country experienced a substantial disparity in the preparedness

levels of different states. The flaws within the public health system presented a significant problem, with inadequacies in the availability of Personal Protection Equipment (PPE) kits, testing kits, and essential supporting equipment (Baru 2020). Furthermore, the national lockdown announced by the Central Government lacked proper preparation for managing human mobility, leaving it to be handled by individual state governments (Baru 2020). As a result, millions of migrant workers found themselves stranded due to the insufficient management of the economic consequences of the lockdown. Domestic production issues also arose concerning ventilators, oxygen supplies, and protective gear for medical personnel (Baru 2020). The shortage of PPE supplies for healthcare workers created a crisis within the healthcare system (Baru 2020).

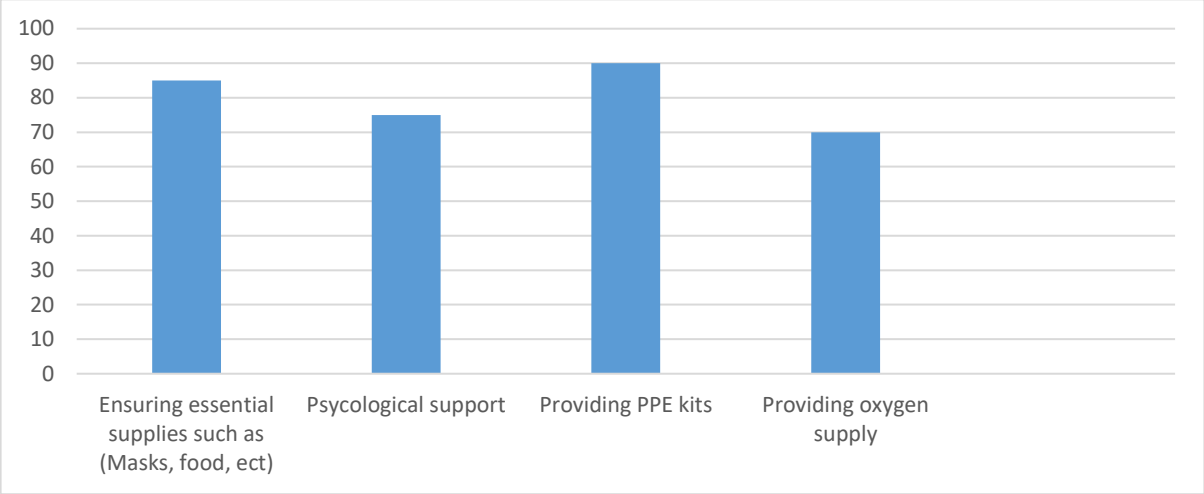
The COVID-19 pandemic has a multifaceted impact on various aspects of life and the global population as a whole. It's recognized that no single organization or stakeholder can effectively control the disease and mitigate its consequences in isolation (Panneer et al. 2021). As emphasized by Ramkissoon (2020), there is a pressing need to implement comprehensive multi-stakeholder management strategies aimed at enhancing the effectiveness and efficiency of humanitarian and crisis operations in addressing the COVID-19 situation. It's crucial to foster the development of crisis management, prevention, and emergency management skills at all levels (Panneer et al. 2021). The spatial dimension of COVID-19 underscores the significance of isolation and quarantine in both workplaces and residential settings (Rice 2020) (Franch-Pardo et al. 2020). Effectively controlling and managing these spatial aspects necessitates the adoption of an integrated, science-driven approach that can facilitate the collection of spatial and non-spatial data, enable the rapid visualization of epidemic information, support spatial tracking of confirmed cases, assist in formulating measures, and enhance the efficient assessment of COVID-19 prevention efforts (Pourghasemi et al. 2020).

6. The contribution of Non-Governmental Organizations (NGOs) in India during the COVID-19 pandemic.

We had identified 100 well-established NGOs that were in operation long before the onset of the COVID-19 pandemic. These organizations were chosen to serve as emergency response agencies during the pandemic. They primarily focused on disaster management, healthcare security, and aiding migrant laborers. Their services covered both rural and urban areas in India, and they had the means to access remote regions due to their transportation infrastructure and a substantial workforce of volunteers. All 100 of the selected NGOs were actively engaged in responding to and addressing the urgent needs arising from the COVID-19 crisis. Almost 45 out of 100 NGOs utilized social media platforms like WhatsApp as a means of spontaneous communication. The remaining organization employed a hotline number to establish effective communication with individuals affected by the virus.

Addressing communities that were already isolated due to containment measures and lockdowns was an urgent matter. Throughout this research, we observed that NGOs played a crucial role in bridging the gap that the government couldn't bridge promptly, as depicted in Figure 2. These NGOs were on the frontlines, 85% actively distributing essential items such as food, masks, and PPE kits. Furthermore, approximately 70% of the NGOs were also engaged in supplying oxygen and 75% providing mental support to those in need. Their effectiveness became even more apparent when we examined their response times. Only 15 organizations reported a minimum two-day turnaround time for their services. The rest displayed remarkable swiftness, with most responding within 24 hours, and four of them even managing to react within five hours.

Figure 2: NGOs operation during Covid-19

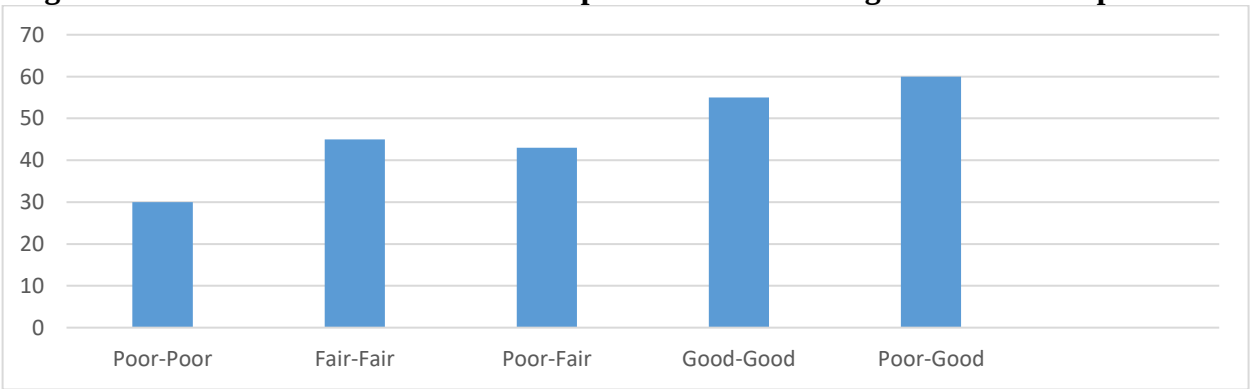


Source: Analysed by the authors.

India's readiness system prior to the COVID-19 pandemic was insufficient to effectively address biological disasters, primarily due to shortages in essential supplies, personnel, and financial support. Additionally, India's preparedness and response framework had historically focused on natural calamities like floods, cyclones, and earthquakes, given the country's vulnerability to such events. However, the COVID-19 pandemic exposed the shortcomings of this system, emphasizing the need for improvements in biological disaster management. These included addressing shortages in medical and oxygen supplies, expanding hospital bed capacity, and bolstering the healthcare workforce. As a result, the system underwent enhancements based on the lessons and experiences garnered during the pandemic.

In order to assess the status of our readiness and response system, we posed two questions that encompass the conditions before and after the onset of the COVID-19 situation in the country. (fig 3)[4]. We employed a five-point Likert scale, ranging from "poor" (rated as 1) to "excellent" (rated as 5), in our questions. The objective of these questions was not to pinpoint the exact circumstances but rather to gauge any enhancements in our preparedness strategies. Out of the organizations surveyed, 10 expressed the view that the situation had remained unchanged. However, their reasons for this perspective varied. Their assessments included poor-poor (20%), fair-fair (45%), and good-good (55%).[5]. Another few organizations opined that our preparedness level increased slightly, and their responses were: poor-fair (43%), poor-good (55%).

Figure 3: The level of NGO services both prior to and following the COVID-19 pandemic.



Source: Analysed done by the authors.

Apart from the subjective questions, we also included specific yes-or-no questions. It was confirmed that all organizations effectively collaborate with similar organizations [6]. This collaboration among

NGOs was evident in their coordinated planning and response to emergency needs during the pandemic. Additionally, 90 percent of the sampled organizations expressed their belief in the effectiveness of vaccines as a means to control the spread of COVID-19 viruses. The majority of NGOs extended their support to communities, encouraging them to get vaccinated. However, what's remarkable is that half of the sample did not undertake any public awareness campaigns aimed at educating communities about pandemic preparedness. Additionally, half of the organizations did not display an interest in supporting vaccination campaigns. This approach is causing concern because there was initially some reluctance from the community to accept vaccines.

However, numerous challenges were encountered during the operations of NGOs in India. A significant issue was the limited transportation infrastructure, which hindered the ability to reach every individual due to the stringent lockdown measures. Consequently, there were obstacles in transporting migrants and delivering essential medical and food assistance. Furthermore, the initial phase of the pandemic was marked by a shortage and difficulty in managing medical equipment supplies. This led to a high demand for PPE kits, masks, medications, and oxygen supplies, which far exceeded the available resources..

Table 1: Specific activities of NGOs

Specific questions	**Yes**	**No**
Whether the internal transportation of materials was a challenge for your organization?	60	40
Have your organization participated in encouraging people to receive the COVID-19 vaccine?	60	30
Have your organization launched any public awareness campaign to help people understand the precautions to take when dealing with a disease?	55	45
Are vaccination campaigns being carried out by your organization?	50	50
Are vaccines help to contain COVID-19?	80	20
Do you Cooperate with other NGOs?	100	0

Source: Analysed done by the authors/ Questions from our survey/.

7. Discussion

India is counted among the most disaster-prone countries globally, facing a high susceptibility to various natural calamities, including landslides, earthquakes, floods, and cyclones. A total of 27 out of 32 states in India are considered vulnerable to such disasters. To address these risks, the Government of India introduced the Disaster Management Act of 2005 as a strategy to reduce or prevent potential losses stemming from disasters or hazards. However, it's essential to note that biological disasters are even more perilous than natural disasters because they occur without any advance warning.

When the COVID-19 pandemic swept through India, both the Disaster Management Act and the Epidemic Disease Act classified the Coronavirus as a disaster. This declaration was made during the initial lockdown period without any additional preparedness plan in place. Handling a biological crisis like a pandemic is a monumental challenge that cannot be effectively managed by governments alone. Collaborative efforts involving local stakeholders, emergency response teams, intergovernmental organizations like UNDP and UNICEF, as well as non-governmental organizations, are crucial. In India, NGOs play a pivotal role in providing services to various vulnerable groups, including the elderly, individuals with disabilities, children, and others. Nonetheless, owing to their prior proficiency in the fields of social security and healthcare, Indian NGOs exhibited a swifter response compared to the Indian Government. Although their services had not been specifically designed for pandemics before the outbreak, their ability to adapt and reconfigure their operations in response to COVID-19 served as an inspiration for the government to deliver emergency services to the public.

However, NGOs in India faced challenges due to the shortage of financial support, medical supplies, and transportation.

8. Conclusion

There is a pressing need to adopt novel strategies to ensure comprehensive emergency outreach. During the pandemic, NGOs encountered transportation challenges, as there was a scarcity of ambulances and other vehicles to transport patients to the nearest healthcare facilities for necessary medical care and oxygen support. Rural residents faced the most substantial difficulties, as delivering essential services and aid, particularly to women and the elderly, proved to be challenging. Hence, the development of new transportation strategies will significantly impact the effectiveness of mitigation and response strategies. It is imperative to ensure the adequacy of the Disaster Management fund. The absence of sufficient funding and financial support created significant challenges for India's disaster management system when responding to biological disasters such as the COVID-19 outbreak. Continuous financial support is indispensable to equip hospitals and healthcare workers with the necessary resources to safeguard lives. Furthermore, maintaining a surplus of essential resources, including food, medical services, and kits, is vital. During disasters, it is crucial to have an ample supply of medical and material resources readily available to address shortages within the community. Creating a comprehensive database of informal workers in every state and allocating healthcare budgets to address their needs is essential. Access to information such as age, gender, and medical history will facilitate the equitable distribution of healthcare services to all citizens. Additionally, financial support is necessary to ensure that NGOs can continue providing their services around the clock. It is imperative to train and equip personnel to effectively respond to such disasters. This includes enhancing their awareness, attitudes, and practices, as well as providing them with protective equipment kits for their work. Furthermore, expanding the workforce in the humanitarian field can be achieved by offering undergraduate courses that cover disaster management and preparedness for various types of catastrophes.

Notes:

[1] South Korea concentrated on contact tracing and virus eradication using its advanced healthcare system, high public awareness, and sophisticated medical technology. At the same time, Sweden focused on maintaining its economy by relying on its high quality healthcare services and universal healthcare coverage (Bhatia et al., 2021).

[2] The MoHFW encouraged citizens to download the mobile application. After installing Aarogya Setu, the user is prompted to answer a series of questions. If some responses indicate COVID-19 symptoms, the data will be sent to a government server. The data will then assist the Government in taking timely action and initiating the isolation procedure, as well as alerting if someone comes into proximity with a person who has tested positive.

[3] Domestic production capacity was 6000–7,000 PPE per day initially, but the number increased to 2 lakh PPE per day on 2nd May 2020 (Baru, R.V.2020).

[4] By after COVID, we mean the date after first reported COVID case in the country.

[5] The number in bracket indicates number of organization responded.

[6] However, there wasn't much co-operation between the Government and NGOs (not included in the table). Six of the NGOs reported that they did not receive much support from the Government, while only one agrees that they receive an excellent support from the Government.

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