Assam Model of COVID-19 Response: Strategies, Challenges and Way Forward

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Abstract

Assam, the largest state of North-East India, has been reeling under the devastating impacts of the COVID-19 Pandemic since March 2020. The annual floods associated with systematic (e.g., Japan Encephalitis, Dengue and Malaria) and cascading risks (e.g Landslides) further increased the vulnerability. The Assam model of COVID-19 response has been acknowledged by the health experts, policy makers and administrators and it has become a source of inspiration for other states as well. Assam government's three T's (Test, Treat, Transport) formula, ruthless quarantine policy, programs like Assam Cares Outreach Program, COVID-Plus and Infectious Disease Surveillance Program helped to reduce the spread of the virus. In this research, a thorough survey and review of the government reports, journals, research papers and newspapers have been systematically conducted. However, there remain many challenges that need to be addressed to ramp up the preparedness and response efforts. The current research includes the best practices, challenges faced by the Government of Assam and way forward in responding to this Public Health Emergency amidst other disasters in the time-period from March 2020 to May 2021.

Keywords: *COVID-19, response, complex disaster, government, Assam State Disaster Management Authority (ASDMA)*

1. Introduction

India is reeling under the devastating impact of the COVID-19 Pandemic since March

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2020 and we still have not got a grip on the situation (Kumar et al., 2020). Assam, the largest state in North-East India holds no exception. Since the first COVID-19 case was reported in Assam on March 31, 2020, the pandemic continues to severely impact all the sectors and segments of society (Choudhury, 2020). Undoubtedly, the healthcare infrastructure already coupled with several challenges is under tremendous stress. According to the Raghuram Rajan commission states wise, Assam has 0.48 beds per 1000 people, which is way below the national average of 1.13 beds per thousand people. Lack of health insurance, medicine & PPE kit, underdeveloped health infrastructure and inaccessibility issues are some of the other common challenges faced in the state (Priyanka raj, 2020). The complex disaster scenario in Assam like Baghjan Gas Leak resulting in massive fire from May 27, 2020, to November 2020, annual floods associated with systematic risk like Japanese Encephalitis, Dengue, Malaria and cascading risk like landslides were also witnessed amidst the ongoing Public Health Emergency (Agarwala, 2020; Guha, 2020) This further exacerbated the response efforts and has questioned the health delivery system of the state.

Central to a holistic response, comes the role of good governance. Good governance involves efficient and innovative management of the available resources, effective decision-making, leadership and a bottom-top approach (Mishra and Singla, 2020). For containing the spread of COVID-19 and managing other disasters, the state government plays an indispensable role and its pro-activeness governs the efficiency of response (Dowerah, 2020). The local governance plays a frontline role in coordinating the response and bridging the gap between the vigorous response needed and the local realities (Dutta & Fischer, 2021).

This paper focuses on the "Assam Model" of managing the pandemic and other disasters from March 2020 to May 2021. Assam's battle against COVID-19 spearheaded by the Assam Health Ministry included several measures from setting up the isolation wards, quarantine centers, community surveillance to issuing new guidelines for relief camps management to handle both the disasters (PRS, 2020). There are several examples of both best practices and challenges faced in managing this scenario under the leadership of the Government of Assam (WHO, 2020). However, the lack of proper documentation remains a major challenge. To fill this gap, this paper aims to document and analyze the steps and strategies of the Government of Assam in handling the COVID-19 Pandemic and other disasters. It is important to keep track of the COVID-19

response in Assam that is currently reeling under the devastating impact of multiple hazards. In this research, a thorough survey and review of the government reports, journals, research papers, and newspapers have been systematically conducted to document the steps taken by the government in managing COVID-19 and the complex disaster scenario. The aim of this paper is twofold: to highlight how the Assam government handled the pandemic and other disasters and to analyze the structural and institutional mechanism involved for the same. A comprehensive review and analysis would help maintain a database of best practices, challenges faced and lessons learnt amidst the COVID-19 response. This would help in dealing with future emergencies more efficiently and effectively.

2. Study Area and Demography

Assam is the largest state of North-East India, encompassing a population of 3.1 crores of which 1.59 crores are males and 1.52 crores are females with a population density of 397/km^2 (Census, 2011). Out of the total population, 86% population live in rural areas and 14% population live in urban areas of the state. Serving as the doorway to the other six north-eastern states, the GDP of the state is Rs 3.24 lakh crore (MOSPI, 2020). The Human Development Index value of the state stands at 0.614 (Global Data Lab, 2018). The state is also prone to floods every year, which cause massive devastation to life and property. Figure 1 shows the study area.

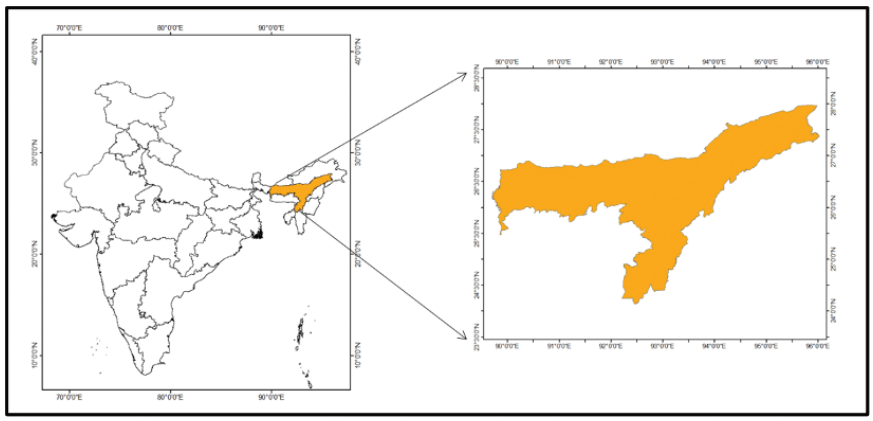

Figure1: Study Area, Assam, India

3. Healthcare System of Assam

The healthcare status of a state is an important indicator of socio-economic development like availability of beds per 1000 patients, health insurance, and availability of medicine, doctors, nurses, PPE kits, and ventilators. The economic survey 2021 shows that Assam has fared well in terms of per capita healthcare as compared to the other states. About 6.4% of the total expenditure has been allocated to healthcare which was much higher than the state-wise average allocation (5.3%) (PRS, 2021). However, there are several challenges like the dearth of human resources, scarcity of beds and hospitals. For every 10,000 population in Assam, there are just 5 Allopathic and Ayush doctors and 15 nurses and midwives. A total of only 20 health workers do not even fulfill the criterion of the lower limit of 23 given by the World Health Organization (WHO) (Kalita, 2021). Table 1 shows the public health facilities and beds in Assam. Also, Assam has a deficit of 28% Community Health Centres (CHCs), 21% Sub-Centres, 1% Primary Health Centres (PHCs) against the sanctioned numbers (MoHFW, 2017). Accessibility to these facilities is another matter of concern. About 31.7% of the primary health centres and 16.8% of the sub-centres are located beyond the 10 km radius and 3 km radius of the village respectively (IIPS, 2010).

Table 1: Number of public health facilities and hospital beds in Assam

No. of Public health facilities					No. of beds available in public facilities	Rural hospitals (Beds)	Urban hospitals (Beds)
Primary Health Center (PHC)	Community Health Center (CHC)	Sub-District Hospital (SDH)	District Hospital (DH)	Total			
1007	166	14	33	1220	19115	10944	6198

(Source: National Health Profile, 2018)

Hospitals and other health facilities are vital assets to communities on a day-to-day basis. Its importance and vitality manifolds during times of a public health emergency or any disaster (Paul et al., 2019). COVID-19 is a live example of it, which has questioned the resilience of the healthcare system. It has posed several challenges for the hospitals

and staff on multiple fronts like the risk of exposure to COVID-19, dearth of hospital beds and health workers, oxygen support, ventilators and equipment like Personal Protective Equipment (PPEs) (Dutt, 2021).

4. Assam and COVID-19

The first COVID-19 case in Assam was reported on March 31, 2020 (Barak Bulletin, 2020). As of May 20, 2021, a total of 347001 COVID-19 cases and 2433 deaths have been reported so far (Government of Assam, 2021).

Table 2: Top 5 most COVID-19 affected districts and 5 least affected districts according to number of positive cases till May 20, 2021

Top 5 districts with highest number of COVID-19 Cases	Positive cases	Bottom 5 districts with lowest number of COVID-19 Cases	Positive Cases
Kamrup Metro	11548	Majuli	97
Kamrup Rural	4083	West Karbi Anglong	197
Dibrugarh	3982	Chirang	276
Nagaon	3482	Charaideo	333
Cachar	2893	Dima Hasao	375

(Source: https://nhm.assam.gov.in/)

4.1 Assam Government's Strategy in Managing COVID-19

Assam Government has adopted a very strong containment cum quarantine policy since the beginning of the detection of the very first case, and since then the government has been working on capacity development and implemented multi-faceted strategies to fight against COVID-19. Strong political will, able and experienced administrators and committed health and frontline workers are the backbone of Assam in minimizing the risk of COVID-19 and bringing stability 4.2 to the lives of the people of Assam.

4.2 Three T's Formula and Quarantine Policy

A huge number of Assamese are working in different parts of India therefore there was an apprehension in the minds of the health experts and administrators that once the lockdown is relaxed then there would be an influx of people particularly migrants

(Das, 2020). To handle this situation, the Government took very prompt action in a very calculated manner with close coordination of Health, Police, and Transportation departments along with local administration to contain the affected people at the border of the state. Strict institutional quarantine centers were constructed in all major districts and followed three T's formula i.e. Test, Treat, and Transport (Das, 2020). Initially, it has been noticed that a maximum number of COVID-positive cases were detected in quarantine centers. Owing to the effectiveness of quarantine centers in the early detection of positive cases, now administration started developing quarantine centers at the block and local level and also equipped local institutions such as Primary Health Centers (PHCs), Auxiliary Nurse Midwives (ANMs), and Accredited Social Health Activist (ASHAs) workers with adequate resources to discharge their responsibility more effectively and segregating patients by accelerating testing (Kalita, 2021).

4.3 Personnel Management and Authorization to Local Institutions

Indian Health Infrastructure has been facing the issue of shortage of trained health professionals even before the COVID-19 pandemic and often North-Eastern States are lagging below the national average. To fill this gap, Assam has especially trained 700 final year MBBS students and 2000 final year nursing students to provide adequate human resources and reduce the pressure on health infrastructure (Das, 2020). In addition to this, by taking a lesson from the first phase of COVID-19 and to improve the capacity and capability of her health infrastructure, in September 2020, the health department of Assam recruited 1000 additional nurses and 215 Intensive Care Unit (ICU) technicians and equipped them with all relevant tools and technology (Talukdar, 2021). Authorization to home quarantine committees was constituted at multiple levels such as urban local bodies, apartment and village level to file a complaint with the local police in case of violation of COVID rules and home quarantine guidelines (Talukdar, 2021). The government has also launched Covid Suraksha App for monitoring the home quarantine and reaching out to the patients (DEB, 2020).

To broaden the social welfare net, the state government started providing Rs1000 for the families not being covered under National Food Security Act, 2013, and local Institutions and urban local bodies were given the responsibility of identification of right kind of benefits and proper distribution of monetary assistance (Paul, 2020). To outreach the migrants and patients stranded outside of the state, a very unique kind

of initiative called the Assam Cares Outreach Program was taken by the then Health Minister Himanta Biswa Sarma. Under this initiative, the administrations reached out to migrants to provide monetary assistance to the lakhs of Assamese people, particularly patients (who wish to return their homes) and were stranded outside the state (Saha, 2020). Through this program, the administration was able to assess the total number of patients located stranded outside the state, mapped them, and created a database system by collecting relevant information such as their travel history and medical history, financial status to track their real-time movement (Northeast, 2020).

4.4 Three 'S' Formula i.e. Surveillance, Segregate and Save the Lives

A massive community surveillance program has been initiated by the health department of Assam by deploying the Accredited Social Health Activist (ASHAs), Auxiliary Nurse Midwives (ANMs), Anganwadi Workers (AWWs), and Village Pradhans along with doctors, community health officers, and lab technicians (WHO-India, 2020). This is popularly known as the Infectious Disease Surveillance Program (IDSP) Team working with the support of local administration. Their key responsibilities include taking random samples of people for the COVID-19 test, spread awareness using ICT while conduct door to door surveys for the identification of diseases other than COVID-19 such as Severe Acute Respiratory Infections (SARI), Influenza, Japanese Encephalitis, fever and malaria. Because of this mass surveillance program, the health department has covered more than 30,000 villages across the state and detected the diseases at the earliest. This program is also known as COVID-19 Plus and was executed with the help of the World Health Organization (WHO-India, 2020). Screening teams took random samples of people who are at a high risk of exposure to COVID-19 like marketplaces, bus stands, police personnel, etc., and conducted door to door surveys. Once the symptoms got detected, they immediately segregated them and began the treatment on the severity level of the patients (Partnership, 2020). As some prominent health experts stated that *"while conducting door to door surveys it has been noticed that people are suffering massively from other diseases as mentioned above consequently state administration intervened immediately and started segregating these people who are very vulnerable and prone to COVID-19. In the initial phase, we collected more than 50000 samples within 10 days. Indeed, it has improved that confidence among the common people by reaching out to them at the earliest".*

Owing to the success of community surveillance in the earliest detection of the symptoms, the government has extended the program as Assam Target Surveillance Program (ATSP) and collected COVID test samples at multiple levels such as a) truck parking and unloading bays including rail yard, god owns, etc. b) Hotel Staff where people are being quarantined c) family members of the health and frontline workers (DHFW, 2020). Lastly, it has generated huge relevant data that helped the experts, administrators, and policymakers to strategize the future course of action and extend the capacity and capability of the health infrastructure and judicious use of limited resources in a more systematic manner.

Non-Government Organizations in collaboration with the state government, are helping the government of Assam in the implementation of various schemes. For instance, remote health care advisory interventions through a project Sarathi, a dedicated telephonic health information system started in 2010, and the child development call center to provide healthcare-related information for pregnant women (Health and Family Welfare, 2021).

Sanjeevni mobile medical care unit in collaboration with the government of Assam were set up to provide healthcare services along with basic lab testing checkups to the rural people (Health and Family Welfare, 2021). Likewise, Oil India Limited, in partnership with Piramal Swasthya, has also supported Mobile Medical Care through its initiative called Sparsha and made primary healthcare services accessible to the vulnerable sections of the society (The Sentinel of the land, 2019). Piramal Foundation, in collaboration with NITI Aayog's aspirational district initiative, is striving to promote and strengthen health and nutritional parameters and also disseminating information about the covid-19 pandemic (CSR, 2019).

4.5 Production and Procurement Strategy

As far as the availability of oxygen and essential medicines like Remdesivir is concerned, the Assam Government has put a very sound procurement policy in place. It has increased its production capacity and also mandated private producers like Premier Cryogenics Ltd to expedite oxygen production by providing all kinds of materialistic and logistic support. There are a total of 10 oxygen plants in operation in the state with a capacity of 67MT production per day (Desk, 2021). Because of this Assam's storage capacity has increased to 468MT since then and it has been increasing making it a surplus state and

even supplying oxygen to neighboring states as well such as Meghalaya, Arunachal Pradesh, Manipur, Mizoram, Tripura and Nagaland (Times, 2021). Concerning the availability of essential medicines like Remdesivir injection, the health department has regulated very strictly and ensured adequate availability of Remdesivir Injection. In one of his interviews, the then Health Minister Himanta Biswa Sharma stated that "the health department has a stock of 25000 of Remdesivir Injection while 1000 kept for non-Assamese people" (Bureau, 2021).

On the other side, the experts and policymakers have stated that the Assam model has been successful considerably because of previous policy initiatives like Ruthless Quarantine Policy, Assam Cares Programme, Assam Target Surveillance Program (ATSP), and Infectious Disease Surveillance Programme (IDSP), and so on (Das, 2020). This has increased the capacity and capability of health infrastructure and health workers along with local administration. That's why they can detect the symptoms at the earliest before it could become a severe case and reduce the burden on health infrastructure. Lastly to equip with and to respond effectively, Assam is the first state which has imported 50,000 Personal Protection Equipment (PPE) kits from China at the earliest (DEB, 2020).

4.6 Complex Disaster Scenario in Assam

Assam battled the fury of the devastating floods and the COVID-19 Pandemic together in the year 2020, hence twinning the burden on the health infrastructure (Simonovic et al., 2021). Assam floods, 2020 affected about 5474 villages, 5 million people and killed 149 people (ASDMA, 2020). Further, floodwaters also washed away the bridge connecting Doomdooma to Baghjan, increasing the vulnerabilities of the 2500 families already affected due to the Baghjan oil field fire (Akhtar, 2020). The floods also exacerbated the systematic risk (like Japanese Encephalitis that affected about 318 people and killed 51 as of September 9, 2020) and cascading risk (like landslides) (Karmakar, 2020).

4.7 Relief and Recovery Efforts by the Government of Assam

Assam State Disaster Management Authority (ASDMA) set up about 1662 relief distribution centers and 627 relief camps as per the COVID-19 protocols (ASDMA, 2020). The government also issued new guidelines for reducing the capacity of relief camps and ensuring food and safe drinking water facilities (The New Humanitarian, 2020). NGOs like Red Cross India, Oxfam India also supplied tarpaulin sheets, food,

water, and other relief materials to the relief camps (ICRC, 2020). Compensation schemes, embankment and flood risk reduction program of ASDMA in collaboration with the World Bank and Asian Development Bank are included under ASDMA's post-disaster response (ADB, 2020). However, despite the efforts of the state government; the complex disaster scenario increased the socio-economic vulnerability of 70% of the agriculture-dependent population in Assam (ASRLM, 2020).

5. Challenges

Floods in Assam increased the risk of diseases like dengue, malaria, and Japanese Encephalitis. COVID-19 fear acted as a barrier to treat these diseases as efforts to destroy the mosquito breeding sites were being hindered (IFRC, 2020). Also, infrastructure failures, lack of awareness among the communities in rural Assam and following COVID-19 protocol in the flood scenario obstructed the efforts of the health care workers (Choudhury, 2020). Children and women were the worst affected by the floods amidst COVID-19, inaccessibility to clean water and sanitation facilities emerged as a major challenge (UNICEF, 2020). Also, the reluctance of the community in relocating to the relief camps due to the fear of being infected with COVID-19 also delayed the relief efforts (The Guardian, 2020). Akhtar (2020) stressed on the less disaster preparedness level of the state in managing floods despite being highly vulnerable to it and the lack of a multi-hazard approach which pushes the state to the brink of socio-economic ruin.

The frontline workers; Accredited Social Health Activists (ASHAs), Auxiliary Nurse Midwives (ANMs) and Anganwadi Workers (AWWs)have been working tirelessly during the COVID-19 outbreak to limit the spread of the virus. Many of them have lost their lives in serving the community. Despite their valuable contribution, they are not being looked after well and are deprived of the facilities like sanitation and hygiene, food, water and insurance. They are not only underpaid but heavily overworked which makes them even more vulnerable (Kabra, 2021).

6. Recommendation

A multi-hazard approach at the implementation level in dealing with different disasters simultaneously is the need of the hour. Also, coordination and partnership with the

various non-governmental organizations (NGOs), community based organizations (CBOs), and civil society organizations (CSOs) need to be properly managed over a platform. It should be mandatory for the hospitals and healthcare facilities to have operational disaster management plans with clearly mentioned standard operating procedures (SOPs) to manage complex hazard and mass casualty scenarios. Regular check-ups and assessments by the concerned officials need to be conducted.

It is seen that addressing the grievances of the community health workers (ASHA, ANM, and AWW) is more of a 'lip service'. We do not have a robust and accountable Grievance Redressal System. Due to COVID-19, the responsibilities of the community health workers have increased many folds and so are the challenges they are facing. Presently, there is not a combined feedback system available for these Frontline Workers, hence there is a need to have a combined 'Social Listening System' where their grievances can be communicated and truly worked upon.

7. Conclusion

COVID-19 has posed unprecedented challenges in Assam and the second wave has aggravated the situation further. Earlier the health of COVID patients deteriorated after 4 to 5 days in the first COVID-19 wave but in the second wave, it was within 24 hours. The third-wave of COVID-19 is predicted to cause insurmountable challenges for the healthcare sector. Therefore, it requires strategies for policy action and long-term planning after taking lessons from the challenges faced in the response efforts during the pandemic in the time period from March 2020 to May 2021.

The Assam model has been acknowledged by health experts, policymakers, and administrators and it has become a source of inspiration for other states as well. Assam government's three T's (Test, Treat, Transport) formula, ruthless quarantine policy, programs like Assam Cares Outreach Program, COVID-Plus and Infectious Disease Surveillance Program helped to reduce the spread of the virus. The role of non-governmental organizations cannot be under-estimated and they have played a key role at all levels right from the preparedness level, execution of the plan, and monitoring and surveillance as well. Various initiatives such as project "Sarathi", Sanjeevi Mobile Healthcare Unite, Project Sparsha, and in collaboration with NITI Aayog's aspirational district, etc. are being acknowledged by the people of all walks of life. But still, lots need

to be done as far as COVID-19 is concerned. Moreover, there is a need to follow the multi-hazard approach to effectively manage complex disasters and the need to have Hospital Disaster Management Plans in place to manage the mass casualty scenarios.

Building capacity and capability of health infrastructure is a prerequisite to fight against the deadly COVID-19 along with effective risk communication to their people. The ongoing pandemic has shown the commitment of our doctors and frontline workers and their service towards humanity. There is a saying that there is no health without health workers and COVID-19 has taught a lesson that a resilient health system can be achieved through its strong health workforce. Therefore, to equip them with the latest tools and technologies, train them and protect them is the need of the hour not just amidst the ongoing pandemic but for the future as well. It is high time to introspect the challenges faced, learn the lessons and ramp up the preparedness and response efforts to create a culture of safety and resilience.

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