

An Assessment of Covid-19 Strategies for Selected States of India – Lessons Learned for Future Pandemics

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ABSTRACT

Introduction: COVID-19 pandemic has severely affected the world and the impact is not uniformly distributed over space and among varying socio-economic, demographic and epidemiological characteristics of population. Government has undertaken several strategies to prevent the adverse impact of COVID-19. Hence, this paper attempts to critically analyse the government's strategies in regions of India having varied vulnerabilities.

Objectives: The objectives of this paper is to identify the strengths, weaknesses, opportunities and threats of COVID-19 response model of selected states of India to highlight the lessons learned for dealing with future pandemics. Also, emphasis has been given to analyse the role of vulnerabilities as part of government's strategies.

Methodology: A SWOT analysis has been performed in this paper through understanding of vulnerabilities and COVID response model of three states of India. The selected states are Madhya Pradesh, Telangana and Nagaland having highest overall COVID-19 vulnerability index among the EAG, Non-EAG and North-Eastern states respectively as formulated by Acharya & Porwal, 2020. The information and data has been collected through government websites of each state and several reports like Rural Health Statistics, National Health Profile etc has been referred.

Critical Findings: The findings of this paper reveal that the EAG states of India have higher socio-economic vulnerabilities; on the other hand, Non-EAG states have higher demographic and epidemiological vulnerabilities. The government response model of each of the state largely followed the government guidelines rather than assessment of their own community needs. Very little efforts have been made to address the state-specific vulnerabilities.

Conclusion: It can be concluded from this paper that there is a need for region-specific strategies for combating the pandemic as each region have their own different needs and vulnerabilities. Further, identified strengths and opportunities should be encouraged and attention should be given on weaknesses and threats.

KEYWORDS: SWOT Analysis, COVID-19 Response Model, Vulnerabilities, Pandemic, Region-Specific Strategies

INTRODUCTION

India has encountered several accounts of epidemics and pandemics throughout the history comprising influenza, cholera, dengue, smallpox, SARS, H1N1 and several others (Swetha, Anantha Eashwar & Gopalakrishnan, 2019). The impact of these epidemics and pandemics are not equally spread out due to diverse socio-economic, demographic and epidemiological characteristics among the states of India. A novel strain of coronavirus belonging to the same family of viruses that cause severe acute respiratory syndrome (SARS) and the Middle East respiratory syndrome (MERS) has emerged as a threat to the world (Cucinotta & Vanelli, 2020). Globally, as of 5:29 pm CET, 21st January 2021, there have been 95,612,831 confirmed cases of COVID-19, including 2,066,176 deaths, reported to WHO. India alone constitutes 10,610,883 confirmed COVID cases and ranks second following the USA which is at the first position (WHO COVID Dashboard).

India; the second-most populous country of the world with diverse geographic, demographic and socio-economic conditions witnessed a severe challenge due to the pandemic. Government of India along with state governments has undertaken several strategies to prevent the adverse impact of COVID-19. Attempts were made to slow down the spread of COVID through the nationwide lockdown. Attention has also been given to the socio-economic & health aspects of the impact of the pandemic. It was clearly understood by the policymakers that the impact is not uniformly distributed throughout the country so containment zones and hotspot areas were identified and zone-specific restrictions were imposed. The differences in the impact cannot be only seen in terms of the spatial distribution of confirmed cases but also among the diverse socio-economic, demographic and epidemiological characteristics of the population. The risk of serious health

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complications as well as the risk of dying as a result of COVID-19 grow rapidly with age and are much higher among people with pre-existing health conditions such as cardiovascular conditions, diabetes, hypertension, chronic pulmonary disease and malignancy (Brandt et.al, 2020). Also, the COVID-19 has disproportionally affected the poor, minorities and a broad range of vulnerable populations, due to its inequitable spread in areas of dense population and limited mitigation capacity due to high prevalence of chronic conditions or poor access to high-quality public health and medical care (Shadmi et.al, 2020; Muscat & Kluge, 2020; Burstrom & Tao, 2020). Further COVID-19 has highlighted health inequities as along with the demographic and socioeconomic variables, the availability and quality of health care is significantly related to the variability in COVID-19 prevalence, mortality and case fatality rates (Phillip Rajkumar, 2020).

Literatures have identified that the pandemic is not uniformly spread out and the vulnerability of COVID-19 is higher among lower socioeconomic strata, older age group and persons suffering from chronic diseases. From a policy point of view, India has been divided into Empowered Action Group states, Non-Empowered Action Group states and North-Eastern states to address the varied socio-economic and demographic conditions. The Empowered Action Group (EAG) is socio-economically backward states in India which are given special attention in development interventions. These states also lag in demographic transition; on the other hand, the rest of the states are at advanced stages of demographic transition; many have achieved replacement level of fertility. Besides, the non-EAG states have a high literacy rate, high life expectancy and the share of the elderly population is high (Kumar & Kumar, 2019).

As the need of the hour is to adopt suitable strategies to address the vulnerability of socially deprived and economically marginalized communities to protect themselves (Singh et.al 2020), the pandemic related strategies should focus on these various regions. The rationale of this paper emerge from the argument that as compared to the SARS outbreak, the international response to COVID-19 has been more transparent and efficient so, various key learning points need to be recorded from the outbreak COVID-19 to combat any kind of outbreak in future (Chaurasiya et.al, 2020). Hence, this paper attempts to study the strategies of government based on different levels of COVID-19 vulnerability in three regions of India namely EAG states, Non-EAG states and North-Eastern states so that necessary lessons can be learned for future pandemics.

Objectives

This paper aims to highlight the lessons learned from the strategies of the government for better response to future pandemics. Following are the objectives of the paper:

- Critically analysing how well the COVID-19 response model has emphasized socio-economic and health-related vulnerability in selected states of India
- Identifying the strengths, weaknesses, opportunities and threats for the state having the highest COVID vulnerability in each of the region i.e. EAG, Non-EAG and North-eastern.
- Identifying lessons learned for strategy formulation of future pandemics at the national level through the SWOT Analysis.

Data Source & Methodology

To fulfil the objectives of this paper, the information and data have been collected from various secondary sources like literatures, journals, newspaper articles, and government websites of respective states. The data for state profile has been taken from Rural Health Statistics 2019, SRS-2018, Census, 2011 and National Health Profile Report 2019. Madhya Pradesh, Telangana and Nagaland are selected as states of India for the study through two levels of procedure. Firstly the whole country has been divided into three regions namely, Empowered Action Group states, the Non-Empowered Action Group States and Northern Eastern states from the relevance of policymaking. Empowered Action Group region is comprised of Bihar, Jharkhand, Odisha, Chhattisgarh, Madhya Pradesh, Rajasthan, Uttar Pradesh and Uttarakhand. North-Eastern states include Assam, Arunachal Pradesh, Sikkim, Mizoram, Nagaland, Manipur, Tripura and Meghalaya. The remaining states are classified as Non-EAG states. At the second level, from each region, one state is being selected as representative of each region having the highest overall COVID vulnerability index formulated by Acharya et.al. 2020. An attempt has been made to understand how effectively each state has addressed the socio-economic and health-related vulnerabilities. Further SWOT analysis has been applied to understand the strengths, weaknesses, opportunities and threats of COVID-19 strategies of selected states of India. Finally, a window of strengths and opportunities is being developed and recommendation has been put forth for future pandemics at the national level.

Result & Discussion

1. Madhya Pradesh: (EAG State)

Madhya Pradesh is a state in Central India and is one of the Empowered Action Group States with a population density of 236 persons per sq. km. The population of Madhya Pradesh is composed of 7.1% elderly population of age 60 & above. According to SRS 2018, the total fertility rate is 2.7 children per women, the infant mortality rate is 48 infant deaths per 1000 live births and maternal mortality ratio is 173 maternal deaths per lakh live births. The state of Madhya Pradesh has performed poorly in terms of demographic indicators. Madhya Pradesh has a large proportion of the population below the poverty line with 31.6% in 2011-12 and the literacy rate is only 69.3%. This indicates that Madhya Pradesh is way behind in socio-economic indicators. The health expenditure as a percentage of state GSDP is 1.04%, the lowest among the EAG states of India. In terms of health infrastructure, Madhya Pradesh has 0.9 sub-centres to 5000 rural population, 0.5 public health centres to 30000 rural population and 0.6 community health centres for 120000 rural populations in 2019 which is much lower than the Indian Public Health Standards Norms. Also, there are only 0.006 government hospitals per 1000 population and 0.377 government hospital beds per 1000 population, which is much lower than the national average. It has 10 medical colleges and 150 mobile medical units. In terms of human resources in the health sector, Madhya Pradesh has 38180 registered doctors in 2018, 39563 registered ANM and 118793 registered nurses & midwives in 2016-17.

COVID-19 Scenario in Madhya Pradesh

As of 19th January 2021, Madhya Pradesh has 251882 confirmed cases of COVID-19. The recovery ratio for the state is 96.1% which is lower than the national average and all other EAG states except Uttarakhand. The case-fatality

ratio is highest in Madhya Pradesh among all EAG states with 1.5% following Uttarakhand (1.7%). The case fatality ratio of Madhya Pradesh is higher than the national average. The test positivity ratio is 4.9% and Madhya Pradesh has conducted 62200 tests per 10 lakh population which is lowest among all states of India excluding Nagaland.

COVID-19 Response Model of Madhya Pradesh:

The first confirmed case of COVID-19 was found on 20th March 2020 in Bhopal, Madhya Pradesh through well-established testing and surveillance of international passengers since 28th January 2020. A nationwide lockdown was followed in the state as per national guidelines imposing several restrictions on public gathering and movement. Madhya Pradesh faced dramatic power tussle game during the initial stage of pandemic. The first initiative of the government of Madhya Pradesh for combating with COVID-19 was based on Kerala model to tackle COVID-19 infection, which was prepared by following WHO protocol of test trace isolate and support to form and implement a strategy. It is known as the IITT Approach which refers to identification, isolation, testing and treatment. Several other targeted measures and interventions involved a survey with Kill Corona campaign for SARI/ILI, formulation of Rapid Response Team (RRT) and Special Response Team (SRT) and use of SARTHAK app for active surveillance. While the early stage focused on the screening of international travellers, the focus in February- march was on improving health capacity and restricting social gathering. The helpline number was introduced and availability of masks and PPE kits were emphasised. Telemedicine unit was also established in 51 district hospitals. Further, financial assistance was given to construction labourers, families of Sahariya, Baiga and Bharia tribes, Social security pensioners were paid advance pensions and people without eligibility slips under National Food Security Scheme was allowed to receive ration. Necessary steps were also taken for migrants through coordinating with other states.

COVID-19 Vulnerability and Government Strategies

Madhya Pradesh has the highest overall COVID vulnerability among all states of India with value 1.0. Index for socio-economic vulnerability, vulnerability due to availability of health care and vulnerability due to housing & hygiene condition is highest in Madhya Pradesh among all EAG states with value 0.886, 0.857 and 0.971 respectively. The demographic vulnerability is lower in Madhya Pradesh with a value close to zero i.e. 0.20. The index of epidemiological vulnerability is moderate with a value of 0.600.

According to the vulnerability index, there is serious concern regarding the availability of health care, socio-economic characteristics and housing and hygiene condition. There have been several measures for tribal, migrants and poor population in the COVID-19 strategies of government but there is a lot more required looking at the vulnerabilities. Also, efforts have been made through the introduction of a telemedicine system to address the epidemiological vulnerability. For the availability of health care, PPE Kits, N95 masks and other medical types of equipment were arranged. Fever clinics were activated across the state as a potent modality for passive surveillance. Along with this COVID, warriors came in many forms for tackling the pandemic. Residential areas were divided into sectors, with Accredited Social Health Activist (ASHA)/grassroots-level health workers each covering a maximum of 100 households (50 households in difficult areas).

2. Telangana: Non-Empowered Action Group State

Telangana is a state in southern India, carved out from Andhra Pradesh in 2014 with a population density of 312 persons per sq. km. It has 8.1% elderly population of 60 and above ages which is equivalent to the national average. As per SRS 2018, the total fertility rate in Telangana is 1.6 children per women, the infant mortality rate is 27 infant deaths per 1000 live births and Maternal Mortality Ratio is 63 maternal deaths per 100000 live births. Telangana's health expenditure as a percentage of GSDP is only 0.82% which is much lower than all north-eastern states and empowered action group states in 2015-16 (NHP-2019). Telangana has 4042 registered doctors in 2018, 2762 registered ANM and 9397 registered nurses and midwives in 2016-17. Telangana has no Public Health Centre and only 0.5 Community Health Centre per 120000 rural populations which is much lower than the established norms of Indian Public Health Standards (IPHS) in 2019. But it has 1.1:5000 for sub-centre which is as per the health institution norms. There are .022 government hospitals per 1000 population which lower than the national average, in contrast, the number of government hospital beds per 1000 population is 1.02 which is higher than the national average in 2015-16. There are 7 medical colleges in Telangana and no mobile medical units in 2019.

COVID-19 Scenario in Telangana

As of 19th January 2021, Telangana has 291872 confirmed cases of COVID-19. Among Non-EAG states, the recovery ratio of Telangana is third highest with 98.1% following Andhra Pradesh (99%) and Haryana (98.2%). The case-fatality ratio is 0.5% with rank second among Non-EAG states from the lower bottom following Kerala with 0.4%. The test positivity ratio is 3.9% which is lower than the national average of 5.6%. Telangana has conducted 200000 tests for per 10 lakh population.

COVID-19 Response Model of Telangana:

The first case of COVID was reported on 2nd March 2020 in Hyderabad, having a travel history of Dubai. Telangana government strengthened the surveillance and control measures for COVID through screening of all passengers at the airport and organising meetings with all private hospitals. Efforts were also made to ensure the sufficient availability of PPE and other medical accessories at the right price. Further, all the private hospitals were prohibited to perform any electric procedures/ surgeries to enhance availability for COVID patients. By 14th March 2020, several restrictions were imposed with the closing of educational institutions, cinema halls, gyms etc and the prohibition on public gathering or events. Also, cash and ration relief were given to migrant workers and food security cardholders. A survey was conducted to count migrants and to ensure transparency photos were clicked while distribution. In the month of April-May, notifications were released to promote the students of Class I to IX and schools were asked to charge only tuition fees. Spitting was banned. Protection & safety of the disabled was also ensured. Along with that management of Telangana were asked to pay wages to all the workers and relief measures were taken to support people on rent. Incentives for COVID warriors were also provided. In June several vacancies were opened for health personnel. In later phases, committees and teams were formed to monitor the procurement and supply of COVID detection kits, vaccine planning & execution and guidance for COVID hospitals.

COVID-19 Vulnerability and Government Strategies

Telangana has the highest value of overall COVID-19 vulnerability index among Non-EAG states of India with value 0.943. It ranks third highest in terms of overall vulnerability among all states of India following Madhya Pradesh and Bihar with value 1.00 and 0.971 respectively. The socio-economic vulnerability in Non-EAG states is quite lower than other states of India. Telangana ranks second highest in terms of socio-economic vulnerability index following Gujarat but the value is just 0.571. Index for vulnerability due to housing & hygiene condition and vulnerability due to the availability of health care is also close to 0.5 with value 0.629 and 0.657 respectively. As compared to these demographic vulnerabilities is quite higher with value 0.714 and further epidemiological vulnerability index also raises attention with value 0.800.

The vulnerability index indicates that epidemiological sector needs most attention as the vulnerability is already high and it will further worsen due to non-availability of health care of non-COVID patients. The attention to this indicator seemed quite missing in Telangana's strategy for COVID-19. Telangana government has taken several measures for socio-economic vulnerabilities through ration and cash relief. Attention was also given to migrants.

3. Nagaland: North Eastern State

Nagaland is a state in North-Eastern India having a projected population of 2477000 in 2020 and a population density of 119 persons per sq. km. It has 5.1% of the elderly population who are 60 and above in age (Census, 2011). Nagaland's 18.9% population is below the poverty line in 2011-12 as per NITI Aayog report. The literacy rate is 79.6% as compared to 74% of the national average in 2011. Health care utilisation is quite low in Nagaland. NFHS-5 reveals that there are only 20.7% mothers who had at least four antenatal care visits, 45.7% institutional deliveries, 43.9% of mothers who received postnatal care by health personnel within two days of delivery and 57.7% of children age 12-23 have got full immunization in 2019-20. In terms of health financing, Nagaland's health expenditure as a percentage of GSDP is 2.97% which is higher than all states of India except Meghalaya (4.20%) and Arunachal Pradesh (3.29%) in 2015-16 (NHP-2019). Nagaland has 116 registered doctors and no medical colleges in 2018, but consist of 11 mobile medical units in 2019. The state of Nagaland has 0.9 sub-centre for 3000 rural population which is lower than the norms of Indian Public Health Standards but the number of public health centres and community health centres has followed the norms with value 1.9 and 1.3 for 3000 rural population respectively in 2019. There are 0.017 government hospitals per 1000 population and 0.872 government hospital beds per 1000 population in 2015-16. The ratio of hospitals is lesser than the national average but the ratio of beds is higher

COVID-19 Scenario in Nagaland

As of 19th January 2021, Nagaland has 12061 confirmed cases of COVID-19. Among north-eastern states, it ranks third from the lower bottom with the highest number of cases in Assam and lowest in Mizoram with 216864 and 4323 respectively. The recovery ratio is 97.1% and case fatality ratio is 0.7% which is better than that of the national average of 96.6% and 1.4% respectively. Among north-eastern states, it has the second-lowest recovery rate following Sikkim (93.8%) but the highest test positivity ratio

of 9.8%. Nagaland has conducted 5740 tests per 10 lakh population which is lowest among all states of India.

COVID-19 Response Model of Nagaland:

The first positive case of COVID-19 was found on 12th April 2020 in Dimapur district of Nagaland. However, the government of Nagaland had already begun strategies for combating COVID-19 since mid-March. The government imposes several restrictions on public movement, closure of educational institutions, shops, restaurant, gyms etc and refraining population from holding any social and religious functions followed by Janta curfew and nationwide lockdown. Several committees and groups were also constituted to monitor the COVID-response model. The government strategies for COVID-19 can be divided into three phases:

1. Initial Phase (March to May): Along with lockdown, the initial phase involved the introduction of self-assessment tools for COVID-19, helpline numbers, actions against rumours, urgent delivery of all medical types of equipment, relief measures for migrants, disabled, frontline workers and other needy people. Free bus services for stranded migrants were also organised. All the essential services were exempted from lockdown. Identification of hotspot zones was also carried out. Telephonic counselling services were also promoted.
2. Middle Phase (June to August): Beginning of the second phase was with Unlock1 having with some relief in lockdown restrictions. Covid care centres were also activated by converting institutional quarantine centres. Online classes were continued.
3. Later Phase (September to December): The later phase began with the partial reopening of schools for students of class 9 to 12 voluntarily for clearance of doubts. Permission was also granted to open skill or entrepreneurship training centres. Odd-even system was followed for vehicles and ban on crackers were imposed to avoid respiratory risk. Restrictions were followed for the celebration of festivals. A new variant of covid-19 entered the state by the end of December along with vaccination beginning in January.

COVID-19 Vulnerability and Government Strategies

Nagaland has the highest overall COVID vulnerability among north-eastern states with a value of 0.657. It has the highest value of demographic vulnerability index and vulnerability due to non-availability of healthcare. In terms of vulnerability due to housing and hygiene condition, it is below five north-eastern states with value .114 which is close to zero. But in terms of a socio-economic vulnerability index, the value for Nagaland is close to one with rank three from the top among north-eastern states following Meghalaya and Arunachal Pradesh. The epidemiological vulnerability is moderate with the value of 0.457. Hence, it can be understood that the state of Nagaland needs higher attention for socio-economic, demographic and availability of health care indicators for combating COVID.

Nagaland's COVID response model indicates that they have released several relief measures for helping the population of lower socio-economic strata like homeless and poor migrants. Distribution of food items and nutrition support was provided at doorsteps for the beneficiaries through Anganwadi workers. Single window for postal service was also initiated for delivery of essential services. Public Distribution System also continued their work. Similarly,

strategies were undertaken to meet the health care requirements of emergency through monitoring the procuring and supply chains of medical types of equipment, oxygen supply etc along with incentives for frontline workers. For demographic vulnerability, the government ordered that person above 65 ages will work from home, even after the reopening of offices in the later period. However, there was no strategy formulated to specifically

address the needs of persons with co-morbidities except telehealth system NISHTHA.

SWOT Analysis for COVID-19 Response Model:

A SWOT analysis has been performed to identify the strengths, weakness, opportunities and threats of COVID-19 response model for India based on the experience of three varied states of India i.e. Madhya Pradesh, Nagaland and Telangana.

STRENGTHS	WEAKNESSES
S1: Guidelines & support by central government S2: Existing Health Infrastructure. S3: Existing Public Health Expenditure S4: Voluntary support by other organisations S5: Committees & Teams S6: Other welfare measures	W1: Existing Health Infrastructure W2: Existing Public Health Expenditure W3: Inadequacy in addressing other vulnerabilities W4: Low Testing
OPPORTUNITIES	THREATS
O1: Innovative Measures O2: Strengthening the Health infrastructure O3: Scope for future research O4: Employment Opportunities & Trainings O5: Improvement in social behaviour	T1: Low digital access & knowledge T2: Existing Vulnerabilities T3: Economic Slowdown T4: New variant of covid T5: Other key areas

1. Strengths:

- **Guidelines and Support by Central Government:** Guidelines from central became the base of strategies undertaken in the state. National level training was also organised by the central government for health personnel of states. Nationwide lockdown protocols also helped the states in combating COVID. Also, National Migrant Information System was provided by NDMA for speedy communication between states.
- **Existing Health Infrastructure:** In Nagaland, the community health centre (CHC) and public health centre (PHC) are as per the norms of Indian Public Health Standards. In Telangana, sub-centres are as per the norms. In both these states, the ratio of government beds to per 1000 population is higher than the national average. Also, Madhya Pradesh and Nagaland have Mobile medical Units adding up as strength to government strategies.
- **Existing Public Health Expenditure:** In Nagaland, the public health expenditure as a percentage of GSDP is already quite high than other states of India.
- **Voluntary Support by other organisation:** In Nagaland, help was offered by ANMA Integrated Association for migrant workers and needy persons. In Telangana, Reliance Industries provided free fuel for emergency vehicles as corporate responsibility.
- **Committees & Teams:** Formulation of several committees and teams like Rapid Response Team & Special Response team in Madhya Pradesh, eleven empowered groups in Nagaland and management teams in Telanagana act as strength ineffective implementation for government strategies.
- **Other welfare measures:** All these three states have introduced ration and cash relief for needy people like migrants, labourers and poor people. In Madhya Pradesh, tribes are given special attention to address their vulnerabilities. Incentives were also provided to frontline workers.

2. Weaknesses:

- **Existing Health Infrastructure:** In Madhya Pradesh, the existing health infrastructure is very poor as the number of PHC, CHC & SC are below the established norms. Also, the ratio of government hospitals and beds to per 1000 population is below the national average. Similarly, there are no PHC & Mobile Medical Units in Telangana. In both Telangana and Nagaland, the ratio government hospital to per 1000 population is below the national average. The number of CHC and SC is lower than established norms in Telangana & Nagaland respectively. There is no medical college in Nagaland. This inadequacy in existing health infrastructure acted as a weakness of the COVID response strategies of government.
- **Existing Public Health Expenditure:** The existing public health expenditure as per the percentage of GSDP is low in both Madhya Pradesh and Telangana adding burden in combating COVID.
- **Inadequacy in addressing other vulnerabilities:** While giving most of the attention towards limiting the spread of COVID, there has been done little to address the other vulnerabilities like mental health and co-morbidities in Telangana. In Madhya Pradesh, socio-economic vulnerability needed more attention. In Telangana, all the private hospitals were asked to not perform any electric procedure/ surgeries to enhance availability for COVID patients. This could severely affect non-COVID cases.
- **Low testing:** In Madhya Pradesh and Nagaland, the testing is very low as compared to other states of India.

3. Opportunities:

- **Innovative Measures:** Telehealth system was adopted in Nagaland and Madhya Pradesh. In Nagaland, counselling services were provided for mental health challenges. Such initiative opens the door for innovation for the development of society. Several apps were also introduced in the states and online platform was promoted for education, training and other official works. In Nagaland, video-conferencing in detention

centres, Point of Sale swipe machine in shops for the cashless transaction was introduced.

- **Strengthening the health infrastructure:** In all these three states, significant attention has been paid on the improvement of health infrastructure through additional medical types of equipment or establishment of specialised clinics and centres. This will provide the opportunity for improvement of health care in India.
 - **Scope for future research:** In Madhya Pradesh, the survey with Kill Corona campaign for SARI/ILI was conducted which might contribute to further research. Similarly, in Telangana, migrants were counted to ensure coverage in providing relief measures.
 - **Employment Opportunities & Training:** In Telangana, several vacancies were opened for health personnel. In Nagaland, the retired medical personnel were requested to join back and vacancies were opened for the post of medical officers.
 - **Improvement in social behaviour:** In Nagaland, the ban on sale and purchase of liquor, crackers etc was imposed. Similarly in Telangana, spitting in public places is prohibited. Such actions will promote good social behaviour among the general public.
- 4. Threats:**
- **Low Digital Access & Knowledge:** Throughout the country, the access and use of the internet are very low. The national average of households having an internet connection is 23.8% and persons who can use the internet is 20.1% (NSSO, 75th round). It is below the national average in Madhya Pradesh and a little above for Telangana. When the digital platform is becoming one of the major tools to combat the COVID related challenges, the low access to digital technology act as a threat.
 - **Existing Vulnerabilities:** The existing vulnerabilities add burden to the mitigation strategies of COVID-19 as Telangana has higher epidemiological vulnerability; on the other hand Madhya Pradesh has a higher socioeconomic vulnerability. Nagaland has a higher demographic and vulnerability due to the availability of healthcare.
 - **Economic Slowdown:** The world economy was already affected and further worsened due to COVID. As a result, it poses serious financial challenges to policymakers and the general public in all states of India. Telangana government deferred the payment of salaries of all government employees.
 - **The new variant of COVID:** Vaccination has been developed but the introduction of the new variant of COVID may pose threats to the COVID response model.
 - **Other key areas:** The locust attack, monsoon season, African swine fever and several disasters has added pressure to the system for diverting their attention from COVID to other areas. In Nagaland deployment of Locust Warning Organisation Team was done during the pandemic.

Lessons learned for future pandemics

The SWOT analysis of government COVID response model has presented a good picture of possible actions needed to be taken in future pandemics. It has been found that there is

a need for understanding the regional variation in vulnerabilities in states of India so that the response model could be formulated based on the needs of the particular region. Also, attention is required for the improvement of health infrastructure and human resources. There should also be increased penetration of digital technology to ensure transparency and coverage in the implementation of relief measures in an emergency. Also, the access and knowledge of digital technology should be reached to grass-root people for helping them tackle the challenges faced during the pandemic while at the same time ensuring social distancing. Tele-health system, online counselling services etc are good innovations and should be promoted. Also, there should be incentives for research activities during pandemics to provide reliable data for the formulation of strategies and relief measures.

Conclusion

It can be concluded from this paper that there is a need for region-specific strategies for combating the pandemic as each region have their different needs and vulnerabilities. The EAG states of India have higher socio-economic vulnerabilities; on the other hand, Non-EAG states have higher demographic and epidemiological vulnerabilities. Therefore, one policy for the whole nation may not work. There should be an emphasis on regional policies through community need assessment for addressing the spatial dynamics of characteristics of the population. This doesn't eliminate the need for National Government guidelines in providing directions to the states.

References

- [1] Acharya R, Porwal A. A Vulnerability Index for the Management of and response to the COVID-19 epidemic in India: An Ecological Study. *Lancet Global Health* 2020.
- [2] Azzopardi-Muscat N, Kluge H H P. Public health in the eye of the storm: What can we learn from the COVID-19 pandemic experience to strengthen public health services in Europe?. *The European Journal of Public Health* 2020; 30(3): 391-392.
- [3] Brandt M, Garten C, Myck M, Oczkowska M, Schmitz A. Ahead of Future Waves of Covid-19: A Regional Perspectives on Health Risks and Healthcare resources in Germany and Poland. *Free Network, Policy Paper Series* 2020.
- [4] Burstrom B, Tao W. Social determinants of health and inequalities in COVID-19. *European Journal of Public Health* 2020, 1-2.
- [5] Chaurasiya PK, Pandey P, Rajak U, Dhakar K, Verma M, Verma T. Epidemic and Challenges of Coronavirus Disease-2019 (COVID-19): India Response. *SSRN* 2020.
- [6] Cucinotta D, Vanelli M. WHO declares COVID-19 a Pandemic. *Acta Biomedica* 2020; 91(1): 157-160.
- [7] Kumar S, Kumar A K. Living Arrangement and Economic Dependency among the Elderly in India: A Comparative Analysis of EAG and the Non-EAG States. *Ageing International* 2019; 44: 352-370.
- [8] Rajkumar P R. The relationship between demographic, psychosocial and health-related parameters and the impact of COVID-19: A study of twenty-four Indian regions. *Medrxiv* 2020.

- [9] Shadmi E, Chen Y, Dourado I, et al. Health Equity and COVID-19: Global Perspectives. International Journal for Equity in Health 2020; 19,104: 1-16.
- [10] Singh S, Mondal A, Mondal S. Socio-economic Vulnerabilities to COVID-19 in India: Swimming against the Tide. Global Journal of Medical Research: K Interdisciplinary 2020; 20(4).
- [11] Swetha G, EashwarA V, Gopalakrishnan S. Epidemics and Pandemics in India throughout History: A Review Article. Indian Journal of Public Health Research and Development 2019.
- [12] Census of India Website: Office of the Registrar General & Census Commissioner, India (censusindia.gov.in)
- [13] SRS (censusindia.gov.in)
- [14] National Health Profile (NHP) of India- 2019 :: Ministry of Health and Family Welfare (cbhidghs.nic.in)
- [15] RHS2019 (nrhm-mis.nic.in)
- [16] Coronavirus Outbreak in India - covid19india.org
- [17] WHO Coronavirus Disease (COVID-19) Dashboard | WHO Coronavirus Disease (COVID-19) Dashboard
- [18] Madhya Pradesh Government's Response to COVID-19 (January 2020- April 17, 2020) | PRSIndia
- [19] Directives & Guidelines – State Portal for COVID-19 Monitoring (nhmmp.gov.in)
- [20] NSDMA COVID-19 DASHBOARD (nagaland.gov.in)
- [21] DEPARTMENT OF HEALTH AND FAMILY WELFARE – Page 10 – GOVERNMENT OF NAGALAND
- [22] Welcome to Telangana Government Order Issue Register
- [23] GOs / Circulars - #TelanganaFightsCorona

