Governance and Public Health: Indian Response to COVID-19 Disaster

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Abstract

COVID-19 has descended as a "black swan" marking a turning point in human existence. "Black swan" is a metaphor used to describe a rare and shocking event having a catastrophic impact. 2020 has been of uncertainties all around the globe. India recorded its first COVID-19 case on 30th January in Kerala. The cases amplified very swiftly before going into lockdown in late March, the country had reported 360 confirmed cases and 7 deaths. On 15th November, 2020, the tally stood at 88,45,616, including over 1,30,109 deaths. This paper attempts to analyse the role of government in planning and dealing with COVID-19 disaster. The study has used primary and secondary data sources. It also tries to bring into light the infrastructural shortage in health which needs to be rectified and put in order to deal with future events of such scale and magnitude. The pandemic has taught the importance of basic saying that "health is wealth". We have incorporated some suggestions which are in sync with international agreements such as Sendai Framework for Disaster Risk Reduction and Sustainable Development Goals. Public health has been focussed upon in all these agreements.

Keywords: *COVID-19, Disaster, India, Health Infrastructure, Government's Response*

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1. Introduction

COVID-19 is a zoonotic (transmission from animals to humans) and infectious disease which was first identified in Wuhan, China and has since become a health disaster all over the globe (UNEP, Wang Z et al. 2020, WHO 2020). As per UNEP Frontiers Report, 2016, around 60 per cent of all infectious diseases in humans are zoonotic (Woolhouse, M.E.J. and Gowtage-Sequeria, S, 2005) as are 75 per cent of all emerging infectious diseases (Taylor, L.H et al., 2001). Previous strains of several corona viruses have been known to cause respiratory infections ranging from common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) in humans (WHO, 2020). On an average, one new infectious disease appears in humans at an interval of 4 months (UNEP, 2016).

On 11th March 2020, the World Health Organization (WHO) declared the coronavirus disease 2019 (COVID-19) a pandemic (Son KB et al., 2020). As defined by WHO, a pandemic is "an epidemic that occurs globally or over a very large area, crossing international borders and usually affecting huge number of people". Within months, it caused an unparalleled turmoil in the lives of people by affecting their health and socio-economic conditions (R Djalante et al, 2020). COVID-19 affected almost every country in the world within three months of its first reported case. The widespread scale of the outbreak called for coordinated efforts from all countries. World's highest health body, WHO released its first situation report on 21st January, 2020. After that, daily and weekly reports have been released to update people all over the globe with current developments. Total confirmed cases recorded on 20th Jan, 2020 were 282 with 6 casualties which spiked to 5,49,11,612 confirmed cases with 13,25,346 deaths from around 220 countries and territories by 15th November, 2020. (Table 1). Country wise, United States has been the worst affected followed by India and Brazil (Table 2). The virus got spread like wildfire. India is the second most populous country in the world and the largest in South Asia with a population of nearly 1.38 billion, therefore, risk of potential infections and deaths are more. Lockdowns, curfews, emergency like situations, closure of country borders, massive airport screenings, quarantines, and physical distancing have become the new normal all over the world.

Table 1: Confirmed COVID-19 Cases

Timeline	Total Confirmed Cases	Total Deaths
15 Nov	5,49,11,612	13,25,346
15 Sep	2,94,08,424	9,31,167
15 Jul	1,31,50,645	5,74,464
15 May	43,38,658	2,97,119
15 Mar	1,53,517	5,735
20 Jan	282	6

Source: WHO COVID dashboard and John Hopkins University

Table 2: Distribution of COVID-19 Cases

Country	Total Confirmed Cases	Total Deaths
USA	1,09,62,835	2,45,933
India	88,45,617	1,30,109
Brazil	58,63,093	1,65,811

Source: WHO, Situation Reports

World Health Assembly in 2011 had rightly stressed upon the point that health hazards and its related disasters could be dealt with and avoided effectively only when the health system of a country is well equipped. The International Covenant on Economic, Social and Cultural Rights, 1976 and the recent Sustainable Development Goals (Goal 3: Good Health and Well Being) lays emphasis on importance of health. Healthy people are pre-requisites for prosperous nations. The Sendai Framework for Disaster Risk Reduction's (SFDRR) goal is to reduce disaster (technological, biological and environmental) risk and losses as well as the laying of the foundation stone for a speedy and sustained recovery and sustainable development (UNISDR 2015, R Djalante et al. 2020). Epidemics and pandemics are grouped into biological hazard category in the SFDRR (UNISDR, 2015). Importance on focussing on health was stressed upon in Sendai Framework and all the stakeholders were suggested to act upon it. Countries should realise that healthy environment and healthy people go hand in hand (UNEP, 2016). The World Health Organization (WHO) defines public health as "all organized measures (whether public or private) to prevent disease, promote health, and prolong

life among people as a whole" (Acheson, 1988). "Global public health" connotes globalisation effects on health as cross border health risks have increased because of increase in communication and trade (Virginia Murray et al. 2015). The role of "science" has been effective in reducing infectious diseases (HIV, Tuberculosis) in public health system across the globe (CDC 2011, Basher 2013).

2. Methodology

2.1 Data Sources

Primary and secondary data sources have been used to complete the present study. A questionnaire survey was conducted online using google form where 406 responses were collected (zip file inserted in the end). Secondary data sources include various portals as well as reports published by the government. Global data regarding coronavirus cases has been taken from (https://COVID19.who.int/) and World Health Organisation as well as John Hopkins University website. State wise confirmed cases and testing have been taken from https://www.COVID19india.org/, https://www.mohfw.gov.in/ and https://nidm.gov.in/COVID19/ministries.asp. Total sample data has been collected from (Indian Council of Medical Research (ICMR)) website and The Press Information Bureau (PIB) bulletin of Ministry of Health and Family Welfare. Various newspaper articles have also been referred to know about the latest updates on COVID-19. National Health Profile-2019 report has been used to get state wise hospital beds (government hospitals only) and number of doctors as well as trends in public expenditure on health. Various countries expenditure on health has also been compared to get an idea where India stands. Policy aspects of government have been taken from The Epidemic Diseases Act (EDA) and National Disaster Management Act (NDMA, 2005).

2.2 Methods

Purposive Random Sampling technique was used to select respondents. People's perception on issues of governance and disaster management was collected by conducting a questionnaire survey online through google forms. A total of 406 responses were received which comprised of academicians (45.6 per-cent), researchers (36.3 per-cent) and working professionals (18.1 per-cent). Primary data was analysed with

the help of charts and graphs. Secondary data sources were used to assess the health infrastructure and compared with confirmed COVID-19 cases. International standard guidelines regarding health have been highlighted and how India faired comparatively has been mentioned. Illustrative charts have been used widely for easy readability. Numbers at times can be confusing but illustrations are easy to interpret.

2.3 COVID-19 Spread in India till mid-November

India registered its first case in last week of January in the state of Kerala. Till 15th March, 2020 cumulative confirmed cases in the country were 112 with 1 fatality. Till mid-July, 2020, 9.7 million cases were recorded. The country recorded 88,45,616 cases and over 13,000 deaths by 15th November, 2020. We have divided the country into 5 zones for better comparative analysis of spread of COVID-19. North zone includes states and Union Territories (UT) of Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Punjab, Uttar Pradesh, Uttarakhand, Ladakh and Chandigarh. West zone consists of Dadra and Nagar Haveli and Daman and Diu, Goa, Gujarat, Rajasthan and Maharashtra. East zone has Bihar, West Bengal, Odisha, Chhattisgarh and Jharkhand while states of Karnataka, Andhra Pradesh, Telangana, Kerala, Tamil Nadu, Puducherry and Andaman and Nicobar Islands (UT) lie in South zone. Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura are grouped in North-East zone. The initial cases were recorded from southern states and these states had the maximum number of infected people till 15th November, 2020. Number of casualties were more in Western states (Table 3). Sate wise total confirmed cases, recovered and casualties has been plotted with the help of a bar chart. With 17,47,242 COVID-19 cases, Maharashtra reported the largest number of infections, followed by Karnataka (8,61,647) and Andhra Pradesh (8,54,011)till 15th November, 2020. According to Health Ministry of India, age group above 60 years recorded 63 per-cent casualty while 30 per-cent mortality was shown among people aged 40-60 years (K Ghosh et al., 2020).

Table 3: Zone-Wise Categorization of Cases in India

Zones	15-Mar		15-May		15-Jul		15-Sept		15-Nov	
	Total Confirmed Cases	Total Deaths	Total Confirmed Cases	Total Deaths	Total Confirmed Cases	Total Deaths	Total Confirmed Cases	Total Deaths	Total Confirmed Cases	Total Deaths
North	41	1	17143	281	209034	5317	846423	14531	1561988	24931
West	36	0	43795	1799	350234	13558	1348393	35237	2210558	52507
East	0	0	6104	238	78616	1316	664113	6755	1283724	13927
North-East	0	0	264	3	25926	61	193873	817	308337	1836
South	35	1	15551	193	285192	3995	1871178	22931	3297082	33818
INDIA	112	1	85856	2753	970169	24929	5018033	82091	8845617	130109

Source: Compiled by Author using data from https://www.COVID19india.org/

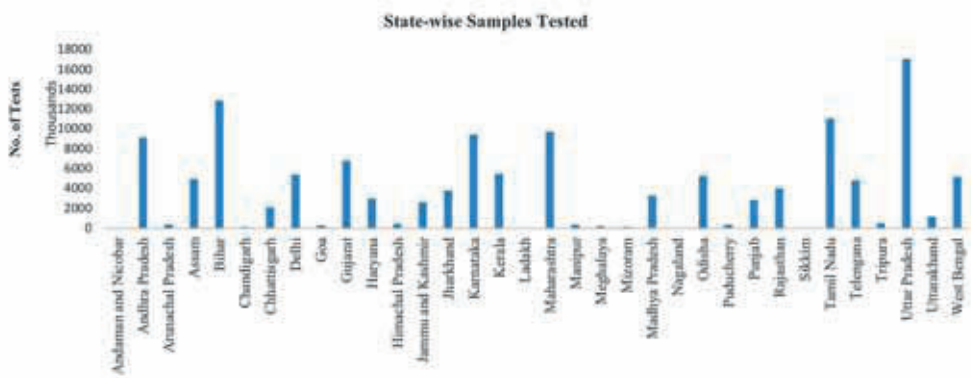

Figure 1: Total No. of Samples Tested

Source: Compiled by Author using data from https://www.COVID19india.org/

2.4 Indian Government's Policy Response

The World Health Organization recommended that countries should actively test, track and isolate as many cases of COVID-19 as possible to contain its spread. Testing showed the rate of infection. Laboratory approved cases are considered as confirmed. This means that the number of confirmed cases would depend on how much a country was actually testing. No data is available without testing. Without data on who is infected with

the virus, we cannot plan for the aggravating pandemic. WHO Director General Tedros Adhanom Ghebreyesus had said that the world needs to "test, test and testTest every suspected case (July, 2020)." Coronavirus cases in the country were on a continuous rise. WHO in its Guidance Note on "Public Health Criteria to Adjust Public Health and Social Measures in the Context of COVID-19" had advised that a country needs 140 tests per day per million population. 22 States/UTs in India were already conducting 140 and more tests per day per million according to PIB updates released on 15th July, 2020 (MoHFW, 15th July, 2020). As per Government of India, total samples tested up to 15th November, 2020 were 13,36,14,975 (Figure 1). For detecting COVID-19, the country was mainly using Antigen, True Nat and real-time-polymerase chain reaction (RT-PCR) test method along with various other tests introduced by the Health Ministry. India did implement its policy of "test, track and treat" to contain the spread of coronavirus. That is why the low fatality rates and higher recovery rates than all the other countries in the world were recorded in 2020.

2.5 COVID-19 Timeline in India

India issued its first travel advisory for people flying to China on 17th January, 2020. The country finally suspended all international travel on 22nd March, 2020 which was also observed as Janata Curfew. This was the time around which almost 150 countries over the world had confirmed cases of corona virus (Table 4). India had recorded 360 confirmed cases and 7 deaths till 22nd March, 2020. Prime Minister declared a complete lockdown for 21 days on 24th March, 2020. He reportedly declared that the lockdown applied to "every district, every lane, every village", and warned about the severity of the pandemic by informing citizens that "If you can't handle these 21 days, this country will go back by 21 years". The lockdown was further extended till 3rd May, 2020 and then till 31st May, 2020. "Phased Unlocks" started from 1st June, 2020. These lockdowns varied with one another in the form of rules and regulations. After that lockdowns were followed by phased re-openings of places in the country based upon various criteria (Figure 2). These criteria's were zonal classifications by the government itself.

Table 4: Chronology of Covid-19 events

30 January, 2020	• First COVID-19 case confirmed by Ministry of Health and Family Welfare in Kerala (a student who arrived from Wuhan, China).
03 March, 2020	• Travel ban imposed by India to China, South Korea, Italy and Iran.
10 March, 2020	• Kerala government closed educational institutions and cancelled all public functions until 31st March. • India's tally of coronavirus cases reached 50 (MoHFW).
12 March, 2020	• India reported its first COVID-19 death. • WHO declared COVID-19 outbreak a pandemic.
14 March, 2020	• Government of India declared COVID-19 a "Notified Disaster".
15 March, 2020	• 112 coronavirus cases reported in the country. • All para military forces ordered by the government to keep quarantine camps ready for virus suspects.
16 March, 2020	• Central government recommended closing of all educational institutes till 31st March. • Social distancing measures suggested by the government as precaution against the virus.
17 March, 2020	• ASI closed 3000 monuments and 200 museums in wake of increasing cases. • Health experts pointed out that India had entered the second stage of transmission of Coronavirus.
19 March, 2020	• No plying of commercial international flight in India for one week from 22nd March.
21 March, 2020	• Rajasthan declared lockdown till 31st March, 2020.
22 March, 2020	• The country observed Janata Curfew. • Railway suspended all trains till 31st March. • Gratitude offered to all people supplying essential services during ongoing pandemic by clapping and clanging utensils as called for by the Prime Minister.

24 March, 2020	• Centre imposed 21 days lockdown all over the country. • Coronavirus cases touched a total of 512 as per MoHFW.
07 April 2020	• Train services suspended further till 30th April, 2020.
09 April	• Odisha became the first state to extend lockdown till 30th April.
14 April	• Lockdown extended till 3rd May in whole country.
17 April	• COVID-19 rapid testing done by Rajasthan.
01 May	• Lockdown extended till 17th May. Ministry of Home Affairs announced relaxation in green and orange zones. • Shramik special trains for migrants started by Railways.
04 May	• The country entered third phase of lockdown
07 May	• India recorded 52,952 confirmed cases.
17 May	• Government extended lockdown till 31st May in the country. India became the first country to impose such longest lockdown.
19 May	• 100000 confirmed coronavirus cases in the country.
08 June	• Phased reopening began after 75 days lockdown.
01 July	• Unlock 2.0 started. Coronavirus cases exceeded 600000 mark.
14 July, 2015	• WHO warned that pandemic could get worse and worse if precautionary healthcare steps are not followed by world.
15 July	• ICMR issued statement that human trial of COVID-19 vaccine initiated in India, • World's most affordable COVID-19 diagnostic kit Corosure developed by IIT Delhi launched by HRD Minister.
17 July	• COVID-19 cases reached more than 10 lakh.
01 August	• Unlock 3.0 started. Gyms and yoga centres opened. Night curfew revoked.
11 August	• "Sputnik V" vaccine by Russia approved for civilian use.

26 August	• India started trials of Covishield started by Serum Institute of India.
29 August	• Centre issued Unlock 4.0 guidelines
07 September	• India reached second spot in the world to record COVID-19 infections.
14 September	• Monsoon session of Parliament began.
19 September	• DGCI approved the "Feluda" COVID-19 test for commercial use.
21 September	• Schools reopened with terms and conditions in many states.
22 September	• 80.86 percent recovery rate recorded.
30 September	• Unlock 5.0 guidelines issued. Cinemas and multiplexes were opened with 50 percent capacity from 15th October.
12 October	• Government briefed that India recorded declining trend in active COVID-19 cases.
15 October	• Doubling time of cases were nearly 73 days in India.
23 October	• Total test count in India stood at 10 crore.
31 October	• India's death rate fell below 1.5 percent.
08 November	• India reported less than 40,000 daily new cases.
20 November	• 50,000 Ayushman Bharat Health and Wellness Centres functional in the country.
25 November	• Almost 13.5 crore tests done.
28 November	• Maharashtra, Delhi, Kerala, West Bengal, Rajasthan, Uttar Pradesh, Haryana and Chhattisgarh contributed around 69 percent of daily new cases.

Source: Compiled by Author from various sources such as PIB and ICMR

Figure 2: Criteria for Zone Classification

Legal regimeis important in emergency situations as it describes the scope of state's response to public health emergencies and the duties and rights of its citizens. The Indian Constitution has no provision for environmental or public health Emergencies as the Epidemic Diseases Act, 1897 does not clearly define the purview of "epidemic disease."(The Statesman, April 30, 2020). The government invoked two laws, the Disaster Management Act and the archaic Epidemic Diseases (ED) Act to manage and control COVID-19 situation. In India, health is a state subject. The Centre holds greater administrative power (decision on national and international trade and travel, testing strategy and imposing or relieving lockdowns) while the states bear most of the administrative responsibility in tackling COVID-19 situation on ground. The country has three-tiered public health infrastructure. Ministry of Health and Family Welfare is the nodal agency at central level for implementing health programs and allied activities (Figure 3). Integrated Disease Surveillance Project (IDSP) tracks trends in incidences of communicable and non-communicable diseases across the country. It has been doing the same and releasing bulletins during the COVID crisis.

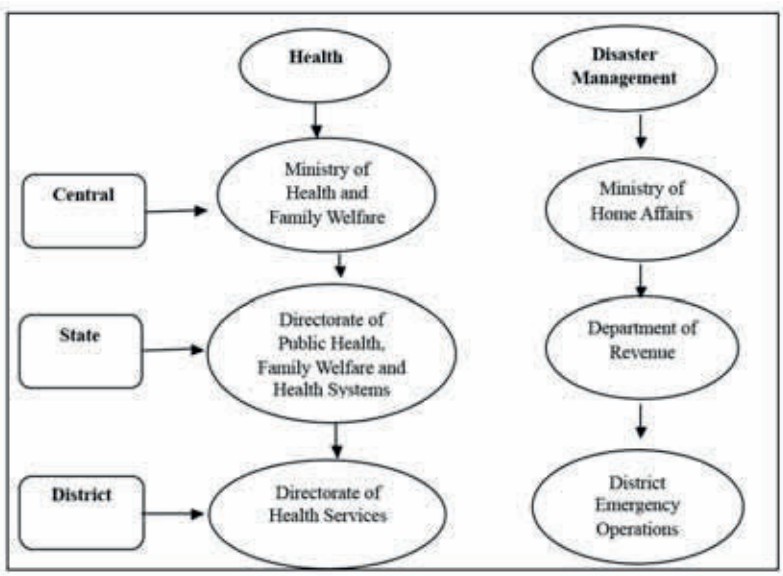

Figure 3: Health and Disaster Management

Source: Author.

The Ministry of Home Affairs issued an order citing the Disaster Management Act, 2005 which authorized the Union Health Secretary for better management and control of COVID-19. The "nationwide lockdown" was imposed under Section 10 of the National Disaster Management Act (NDMA). The government ordered the states to implement The Epidemic Diseases Act, 1897 to execute the advisory effectively (The Print, 23 March, 2020). Quarantine and mandatory screening rules were ordered under the ED Act by the states.

The National Disaster Management Authority (NDMA) issued various notifications to implement the provisions of the Disaster Management Act, 2005. When lockdown was imposed in the country, several states under the ED Act, 1897 passed the COVID-19 Regulations, 2020.

Section 144 of the Code of Criminal Procedure, 1973 was used to impose restrictions on assembly and movement of people within and among states. Religious freedom was also curtailed to limit public interaction.

Under section 2 of The Epidemic Diseases Act, 1897, Himachal Pradesh government announced The Himachal Pradesh Epidemic Disease (COVID-19) Regulations, 2020,

the Delhi government announced The Delhi Epidemic Diseases COVID-19 Regulations, 2020, and the Government of Maharashtra announced The Maharashtra COVID-19 Regulations, 2020 where particular measures have been taken by these states to tackle and control the pandemic.

The Epidemic Diseases (Amendment) Bill, 2020 was introduced on 14th September, 2020 in the Rajya Sabha to amend the original Act of 1897. This had provisions for healthcare workers who are in the frontline fighting with the deadly virus and saving people's lives. The Act also described "act of violence" against healthcare workers and the punishment it will draw for the said offence.

The Integrated Disease Surveillance Programme has been activated as a response to the pandemic by the Centre. It was launched by the Ministry of Health and Family Welfare, in assistance with the World Bank in 2004. The government has a dedicated website https://www.mygov.in/COVID-19/ to provide country wide data as well as updates to the citizens (Figure 4).

Figure 4 : Screenshot of Front Page of COVID-19 website of Government of India

India developed for the first time a Participatory Disease Surveillance (PDS) model to track coronavirus based on mobile location with the name Aarogya Setu which translated to "A bridge to health" in Sanskrit. Participation of people was said to be voluntary initially, however, several states made it compulsory afterwards (Singh S. 2020, Garg, S. et al., 2020). Social protection support and fiscal stimulus packages were adopted by the Government. Rupees 20 lakh crore (10 percent of India's GDP) were allocated under economic package which aimed at making the country self-reliant

and voicing for locally manufactured items under "Atmanirbhar Bharat Abhiyan" in the post-COVID world. As COVID cases started to expand its footprint all over the country, the government strengthened its infrastructural capacity. There was only one testing lab at Pune in January which was rapidly increased to 1223 by mid-July. Dedicated COVID Hospitals were set up and ventilators capacity increased to support the patients (Table 5). Dedicated COVID Hospitals were meant for severe cases. Dedicated COVID Health Centres dealt with moderate assigned cases while mild/very mild/COVID suspect cases were treated in Dedicated COVID Care Centre.

Table 5: COVID-19 Infrastructure

Dedicated COVID Infrastructure	15 May	15 July
Dedicated COVID Hospitals	919	1,378
Dedicated COVID Health Centres	2,036	3,077
Dedicated COVID Care Centres	5,739	10,351
Ventilators	18,855	21,738
Total Labs for Testing	509	1,223

Source: Compiled from Ministry of Health and Family Welfare Data.

3. Results and Discussions

3.1 Government Policies and Programs

Most of the respondents agreed that the government was successful in making people aware about the virus and its effects (Figure 5) For example, the government widely used Information and Communication Technology (ICT) tools to inform its citizens about the communicable disease and precautions required to stay safe. Of all the respondents, 60.3 percent people did know about Aarogya Setu app while 27.3 percent were confused about it (Figure 6). However, they also felt that health machinery requires more improvement in dealing with COVID crisis (Figure 7). As per WHO guidelines,

there should be one doctor for every 1,000 people. However, Bihar has one allopathic doctor for 43,788 people which describes the abysmal situation of healthcare in some states. Delhi had one doctor for 2,208 people. However, all the states failed to meet WHO criteria on doctor-patient ratio.

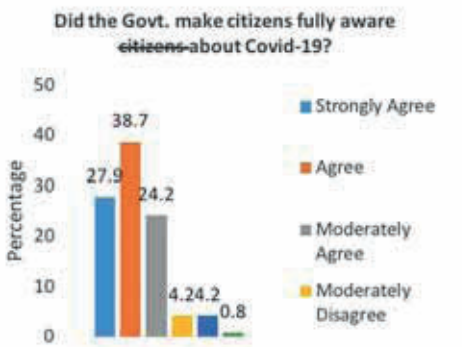

Figure 5: Perception of People about Govt. Initiatives

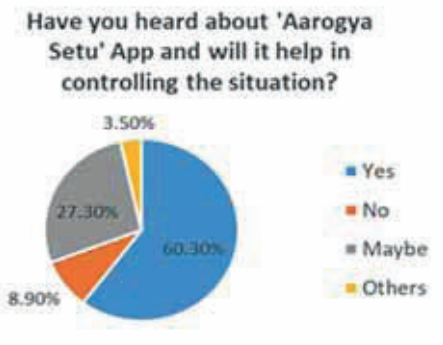

Figure 6: Awareness about "Aarogya Setu" app

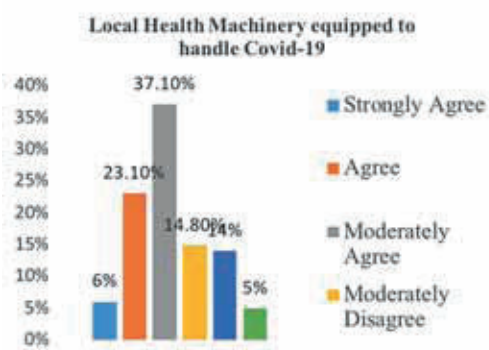

Figure 7: Local Health Machinery and COVID-19

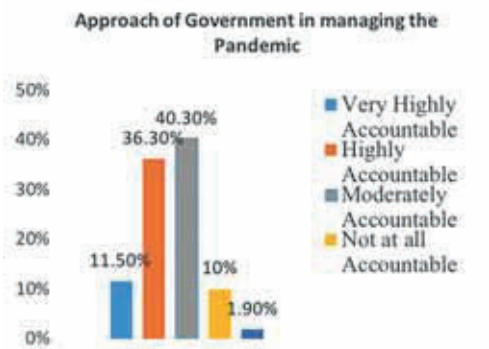

Figure 8: Government's Role in Pandemic

About 40.3 percent respondents ranked the government as moderately accountable in managing the pandemic while 36.3 percent answered that the government was highly accountable (Figure 8). This showed that people had faith in their elected government. India scored 100/100 in Oxford University's Tracker Measuring Governments' Response to COVID-19 which was published on 11th April, 2020. However, this tracker is not an absolute one since some countries which flattened the curve didn't even get a place in this index.

3.2 Social Aspects and Disaster Management

However, when asked whether they were prepared for the sudden lockdown announced, same number of people affirmed and negated it (Figure 9). One limitation might be that the respondents were basically academicians and might be well off economically than poor people and hence the answer. Almost 70 percent people agreed that people are panicking and scared because of loss of livelihood (Figure 10). Daily earning is a crucial factor in a country like India where people live from hand to mouth. Approximately, 46.4 percent respondents strongly opined that hunger and poverty are a bigger threat than the virus to marginalised people during lockdown (Figure 11). The lockdown had severely impacted the lives of daily wage earners.

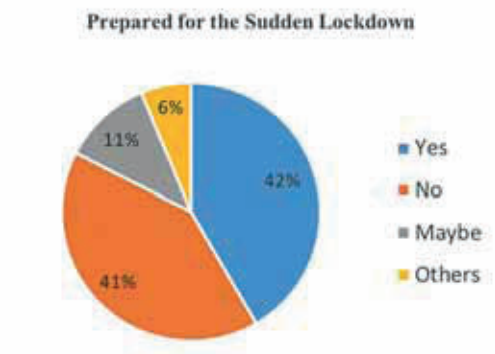

Figure 9: Whether prepared for Sudden Lockdown?

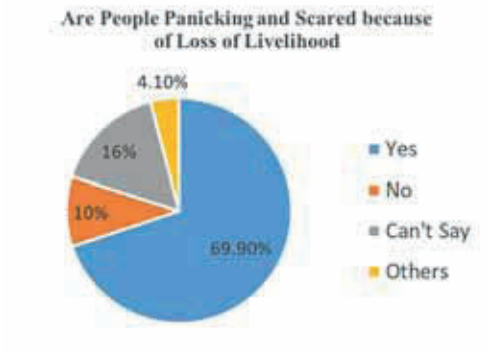

Figure 10: Lockdown and Livelihood

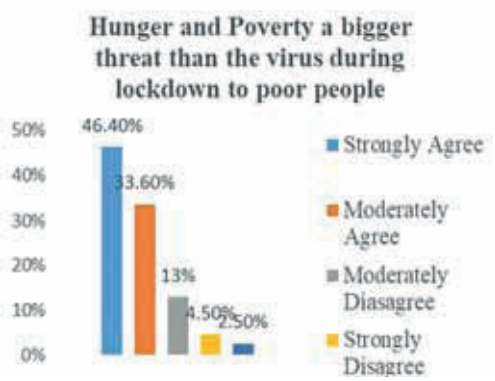

Figure11: Hunger, Poverty and Lockdown

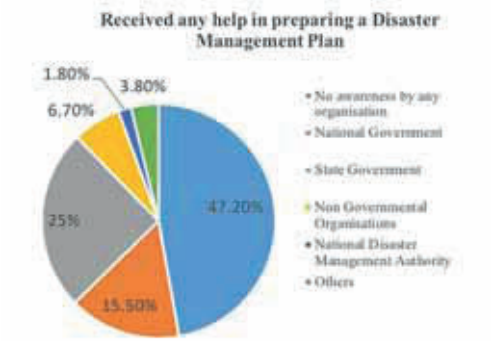

Figure12: Awareness about any Disaster Management Plan

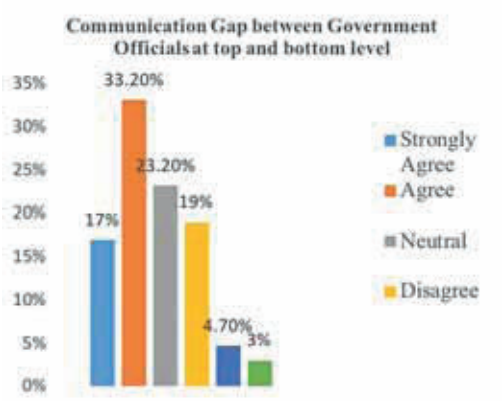

Figure 13: Communication Gap

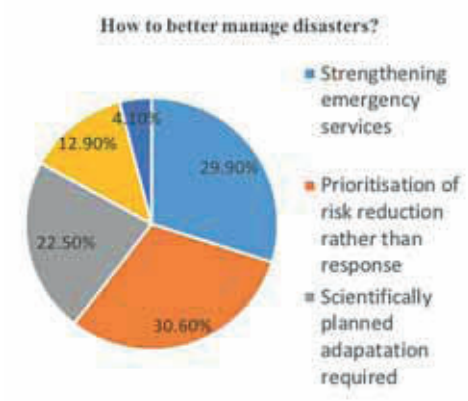

Figure 14: Disaster Management

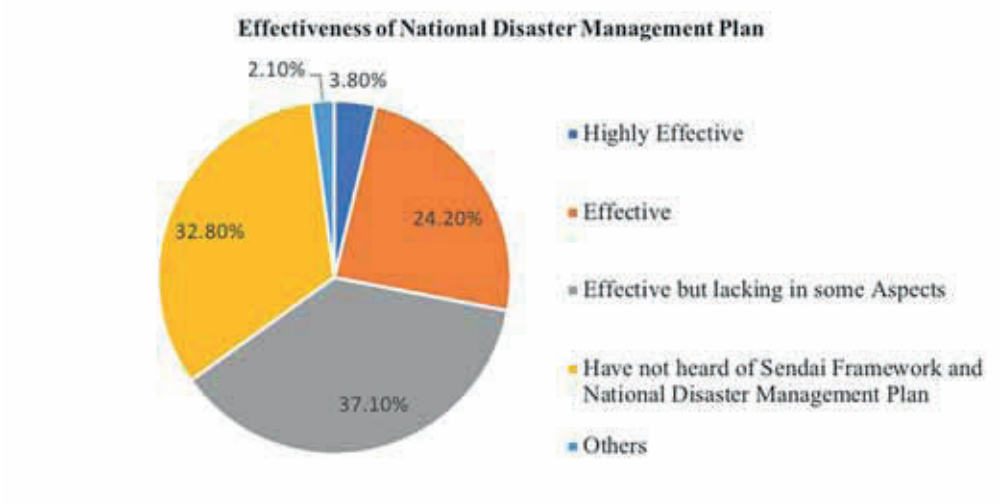

Figure 15: Effectiveness of Disaster Management Plan

Even though the country is prone to hazards, disaster management awareness and training is comparatively very low. Out of total respondents, 47 percent people have never received any awareness by any organisation during or before any disaster which is shocking. Almost 15.5 percent samples have received assistance from national

government and 25 percent from state government while 1.8 percent received information from National Disaster Management Authority (Figure 12). Approximately, 33.2 percent respondents felt that there exists a communication gap between government officials at top and bottom level (Figure 13). This might be the cause why policies lack proper ground implementation. When asked how disasters can be managed effectively, majority (30.6 percent) insisted on prioritisation of risk reduction rather than response followed by (29.9 percent) strengthening emergency services and 22.5 percent said that scientific planned adaptation is required (Figure 14). Figure 15 shows that more awareness about Sendai Framework and National Disaster Management Plan needs to be done to better and effectively manage disasters at community level.

4. Suggestions

Health systems cover all the health agencies in a country and these are interconnected and organised for better functioning. Consistent efforts are made to improve the quality and functioning of these life-saving organisations by their respective governments (WHO 2007).

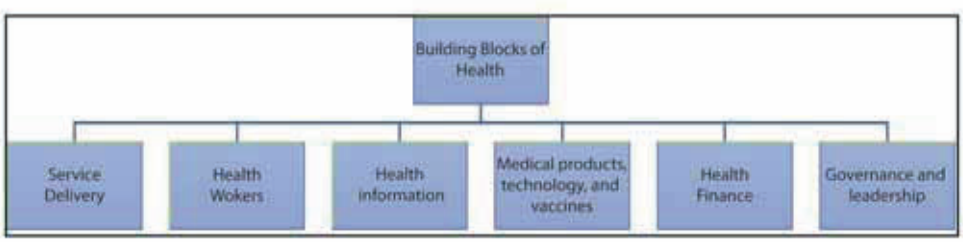

Figure 16: Building Blocks of Health

Source: WHO

Human resources and health infrastructure form the most important component of public health. Having sufficient number of people with the right combination of skills and appropriate use at different levels of health care is important to ensure effective medical care for the people. Infrastructure is an important indicator for understanding the health care delivery provisions and welfare mechanism in a country. As per National Health Profile, 2019 the highest number of doctors are in the state of Maharashtra

(1,73,384) followed by Tamil Nadu (1,33,918) and Karnataka (1,20,261). Maximum number of beds in government/public hospitals are in the state of Maharashtra (51,446), Karnataka (42,656) and Tamil Nadu (38,326). According to the latest data from the Organization for Economic Cooperation and Development (OECD), India has 0.5 beds per 1,000 people compared to 0.4 in 2009, but it is one of the lowest among all the countries surveyed by the OECD. China has 4.3 hospital beds per 1,000 people while the United States has 2.8 as per the same survey of OECD. However, the most number of confirmed coronavirus cases have also been observed in the states of Maharashtra, Karnataka and Andhra Pradesh (MoHFW, 15 Nov, 2020).

The most effective way to prevent COVID-19 infections and save lives is breaking the chains of transmission which can only happen if testing rate is increased. Vaccination is considered as an effective tool in saving lives. This would require a standard healthcare system in place comprising of adequate infrastructure, trained doctors, nurses and other essential service providers. The World Health Assembly designated 2020 as the International Year of the Nurse and the Midwife. These people are fighting the frontline war against the virus and acting as a shield for the general public.

4.1 Improving Health Diagnostics and Infrastructure

As health is a state subject, Union government's role could, at best, be advisory and coordinating in nature (Economic Times, 14 April, 2019). Public Health (Prevention, Control and Management of Epidemics, Bio-terrorism and Disasters) Bill 2017, proposing to repeal the Epidemic law of 1897, if passed by Parliament should have been more apt and justifiable during the ongoing epidemic.

The NDMA, along with the National Disaster Response Force (NDRF), did India's first full-scale biological management emergency mock drill at Patna airport in the summer of 2018 to spread awareness among the masses about biological disasters but it was a one-time story. No follow up happened after that. National Health Profile-2019 data has shown that total number of government hospital beds available in India are 7,35,917. This means that per capita hospital beds in India is 0.55 per 1,000 population (K. Ghosh et al., 2020, Ray et al., 2020). As per a report by the Centre for Diseases, Dynamics, Economics and Policy, Washington, India has huge shortage of 6,00,000 doctors and 2 million nurses.

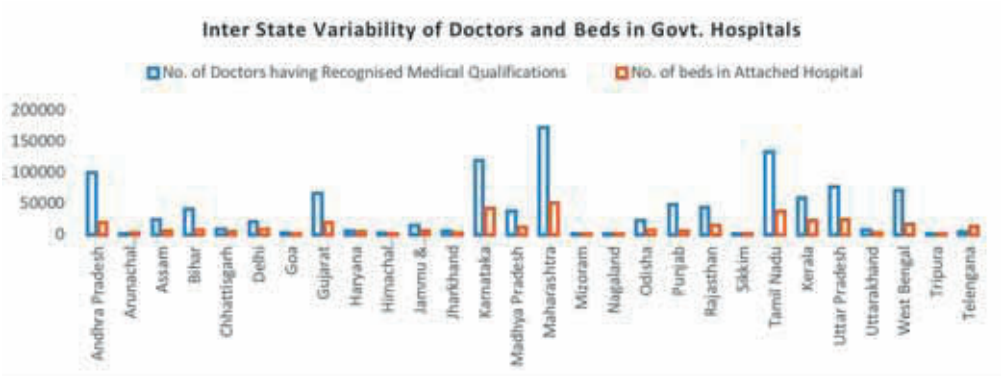

Figure 17: Inter State Variability of Doctors and Beds in Government Hospitals

Source: Data from National Health Profile, 2019 and CDDEP, 2020

Since government hospitals charge a nominal fee as compared to private ones, majority of the population prefers these hospitals to avail the benefits of Public Distribution System. National Health Profile showed that most of the states need to expand their health infrastructure to meet global targets. Number of beds were not sufficient and thus to tackle this issue, dedicated COVID infrastructure was established by the government.

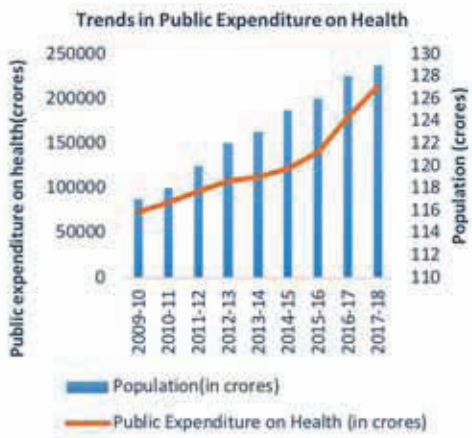

Figure 18: Expenditure on Health

Source: Data from National Health Profile, 2019

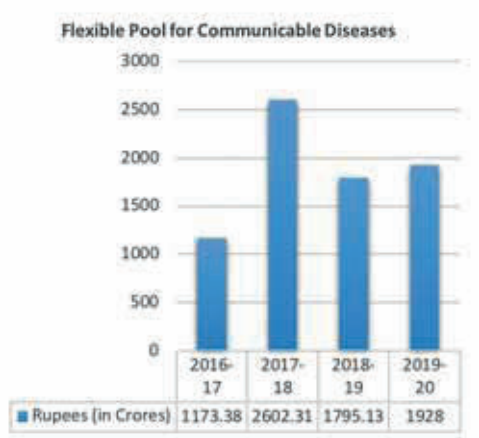

Figure 19: Funds for Communicable Diseases

Source: Data from National Health Profile, 2019

The country has more than 1.3 billion people. Population numbers have been increasing but investment in health has not been up to the mark (Figure 18). This clearly shows that governments were not responsible while planning for health. Flexible pool of funds for communicable diseases was highest in 2017-2018 when compared for time period between 2016 to 2020 (Figure 19).

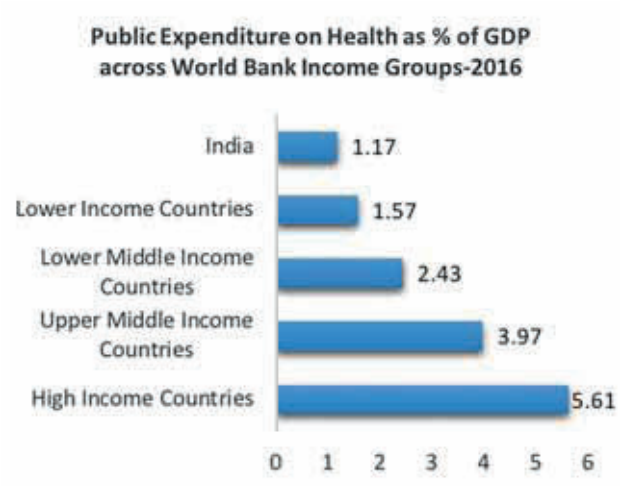

Figure 20: Comparison of Funds Allocated by Countries on Health.

Source : Data from National Health Profile, 2019

India has been categorized as a Lower Middle Income Country by World Bank but its expenditure on health is almost half of its other counterparts in the same category. National Health Profile-2019 shows that India spent 1.17 percent of its GDP on health as compared to other Lower Middle Income Countries who spent 2.43 percent (Figure 20). President of Public Health Foundation of India, Prof. K Srinath Reddy put forward that COVID-19 cases in India might peak in mid-September only if all suggested precautions are followed by people combined with government actions. His suggestions included social distancing and wearing masks which were to be followed strictly by the public. He also talked about government actions and measures regarding boosting of health infrastructure in the country which could act as the main tool in combating the deadly virus.

4.2 Adaptive Development

Adaptive development alleviates climate change risks without compromising the well-being of people and their ecosystems. This uses incentives, institutional help and information-based policies to address the various components of climate risks (Agarwal and Lemos, 2015). Adaptive development relies on bridging gaps in climate adaptation to reduce the risk of sudden shocks or disruptions that occur slowly. This becomes very important for a country like India where considerable number of people fall below poverty line. 25.7 percent people in rural areas and 13.7 percent in urban areas are estimated to be poor (Planning Commission, 2011-12).

COVID-19 makes us realise that how important sustainable development is to mankind. The world has almost turned upside down in the year 2020. Countries will try to meet their growth targets as soon as the virus gets eliminated. This might bring pollution and emission levels to pre-COVID times. Clean air, water and oceans with countless free movement of birds and animals are not expected to exist in the post-COVID world. Arguments for declining consumption also do not hold ground seeing continued poverty. Adaptive development can be an answer in dealing with these chronic socio-economic problems. Agarwal and Lemos offer solutions that are compatible with adaptive development, such as safety nets for migrant workers, protection of agricultural land, promotion of crop diversification, subsidies for sustainable use of water and land, etc. Although they are also promoted in the context of climate adaptation, adaptive management must generally integrate them into development options. Raghu Murtugudde, a professor at the University of Maryland is of the view that "Adaptive development would naturally sustain the ability of both the government and the society to respond rapidly and effectively to shocks such as COVID-19."

Adaptive development is in sync with Sustainable Development which the world is aiming at. Growth and development would be achieved without causing much damage to natural resources. For a country like India with variable climatic features, achieving economic development is a basic necessity for the survival of its citizens. Adaptive development would help in livelihood options with dignity.

4.3 Human Rights Context

The World Health Organisation has stressed upon the importance of respecting human rights while managing the COVID-19 crisis. India has approximately 139 million migrant

population (Census of India, 2011). Migration of workers were highest than ever recorded till date in India (Economic Survey, 2016-17). It found out that each year, an average of 9 million people migrate in avenues of better education and livelihood in our country. The planning for containment of COVID-19 cases through means of nationwide lockdown had a loophole that it did not take into consideration these migrants. People have the right to seek and receive information regarding important health measures taken by authorities under the International Covenant on Civil and Political Rights (ICCPR) of which India is a state party. A 4-hour notice before implementing countrywide lockdown could have been avoided or a more people friendly approach could have been adopted. Migrant workers had to face some difficulties. As the saying goes, "the carrot is as important as the stick"; a well analysed comprehensive planning process could have been more beneficial for "Sabka Sath Sabka Vikas", translated as "collective effort, integrative development". Upholding human rights during a crisis increases the trust of people in their government and a better cooperation can be achieved from them.

5. Conclusion

Every new threat brings up a new challenge. COVID-19 is one of such threats. It has highlighted that healthcare system is the backbone of an economy and countries should take Sendai Framework suggestions more seriously.The pandemic has taught us that communicable diseases follow no boundary and the threat has increased multi-fold with globalisation and increased trade. Only way to minimise the losses are by strengthening the health facilities of a country. Biological disasters are as serious as natural ones. Science and technology are accelerants of progress. The government invoked the Epidemic Diseases Act, 1897 initially to deal with the situation arising out of COVID-19. This act has no mention of word "epidemic disease" and how to deal with it whereas COVID-19 was labelled as a pandemic by WHO. This makes us to retrospect that the country needs to plan holistically for such future events with a more humanist approach. The Epidemic Diseases (Amendment) Bill, 2020 was a positive step to deal with some problematic situations. The government's step of universal health coverage in recent times is appreciated but more efforts are required to make it more inclusive and efficient. Moreover, the benefits should reach the poor residing in every part of the country. One room house for the informal sector can be thought of as it will be beneficial for the poor as well as the country.

We have seen how there are inequalities among states in terms of hospitals, beds and doctors. No Indian state meets WHO criteria of one doctor for 1000 people. Budget is prepared by the government. While planning for it, these points should be kept in consideration. Focussing on health and its management should be the first priority on government's planning as health is a prerequisite for sustainable development of the country.

Educating people about what and what-nots to follow during a disaster is also important. Help of ICT tools can be taken like Aarogya Setu app which was launched by the government and it became quite popular among the masses. But, ICT tools would be most helpful when people possess a smartphone or have internet connectivity. At this point, government can take help of local government officials and these need to be implemented in ground sincerely.

India's response to COVID-19 has been pre-emptive, pro-active and graded as per Union health Ministry. But, a more inclusive approach is need of the hour. Testing has increased substantially since last year. Vaccination drive has started in the country and from 1st May, 2021 individuals aged 18 years can be vaccinated. More and more people are following COVID appropriate behaviour which is need of the hour.

We summarise by quoting Mahatma Gandhi "It is health that is real wealth and not pieces of gold and silver." The government's topmost priority should be the health of its citizens. Rest everything will follow. Primary survey was conducted with people who were thought to have some basic facilities like a computer and internet connection which might be a limitation of the study.

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