India's Preparedness and Response Towards CO-VID-19 Management as per WHO Health Emergency and Disaster Risk Management Framework

By

Annie Tauro

Dissertation submitted in partial fulfillment of the requirements of the degree

MBA Hospital and Health Management

Academic year, 2018-2020

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TO WHOMSOEVER MAY CONCERN

This is to certify that Dr. Annie Tauro, student of MBA Hospital and Health Management from IIHMR University, Jaipur has undergone dissertation at IQVIA Consulting Pvt Ltd from February 3, 2020 to June 12, 2020.

The candidate has successfully carried out the study designated to her during dissertation and her approach to the study has been sincere, scientific and analytical.
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CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **India's Preparedness and Response towards CO-VID-19 Management as per WHO Health Emergency and Disaster Risk Management Framework** and submitted by **Dr.Annie Tauro**, Enrollment No. 0721, under the supervision of Dr. J.P Singh for the award of MBA in Hospital and Health Management carried out during the period from February 3,2020 to June 12,2020 embodies my original work and has not formed the basis for the award of any degree ,diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Dr. Annie Tauro

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List of Abbreviations

1. WHO – World Health Organisation
2. COVID 19 – Coronavirus Disease
3. CDC – Centre for Disease Control
4. PCR – Polymerase Chain Reaction
5. MoHFW- Ministry of Health and Family Welfare
6. GOI- Government of India
7. NHA - National Health Authority
8. IDSP - Integrated Disease Surveillance Programme
9. PDS - participatory disease surveillance
10. DVDMS – Drug and Vaccine Distribution Management System

Introduction

According to Dr. Margaret Chan, WHO- Director General (2012), “Prevention and preparedness is the heart of public health. Risk management is our bread and butter.”

The threat public health faces across geographies today range from communicable disease outbreaks to wars, radiation and chemical hazards, natural and technological hazards, and the health consequences of climate change and contamination of food and water. In order to meet these challenges, countries need to focus on **prevention, preparedness, response and recovery** to strengthen their capacities for health emergency and disaster risk management**.**

As per the WHO, The Health Emergency Disaster Risk Management comprises of following components [1]:

1. Policies, Strategies and Legislation
2. Planning and Coordination
3. Human Resources
4. Financial Resources
5. Information and Knowledge Management
6. Health Infrastructure and Logistics
7. Risk Communication
8. Health and Related Services
9. Community Capacity
10. Monitoring and Evaluation

Background and Rationale

A novel coronavirus spillover event, with its epicenter in Wuhan, People's Republic of China was declared a Public Health Emergency of International Concern by the WHO on 30 January 2020.Today, more than 188 countries have been affected by the virus causing widespread healthcare and socio-economic disruption. Countries which have suppressed the spread of COVID-19 below the threshold took measures for the implementation of comprehensive public health measures such as rapid case identification, rapid and large number of testing, isolation of cases, comprehensive contact tracing and quarantine of contacts thereby bringing the outbreak under control while ensuring delivery of quality clinical care and continuity of essential health services. In regions where the disease has

already caused high fatalities, it is essential to test if the result is due to a wider spread of the disease with a smaller death rate, or a larger death rate in a smaller subpopulation which has contracted the virus.[2]

As per the latest report of WHO, following is the statistics of cases for the pandemic as of 16th June 2020[3]:

a. Globally: 7 941 791 confirmed (118 502 new) and 434 796 deaths (3 255 new)
b. South East Asia Region: 486 673 confirmed (15 281 new) 13 409 deaths (482 new)

The WHO has declared the risk assessment for CO-VID to be high. India is now among the worst-hit countries and its grossly under-funded and patchy public health system, with huge variations between different states, high population density and concept of joint families poses special challenge for the country's disease containment strategy.

This study analyses secondary data and literature review in order to see the current situation of pandemic and preparedness and response of India towards managing COVID -19 according to WHO Health Emergency and Disaster Risk Management Framework.

Research Question:

1. What is the current situation of COVID-19 in India and Globally?
2. How is the preparedness and response of India towards managing COVID -19 when studied according to WHO Health Emergency and Disaster Risk Management Framework?

Objective:

To perform descriptive study of India's preparedness and response approach towards managing COVID-19 as per the WHO framework of Health Emergency Risk and Disaster Management, and the current situation of the pandemic in country.

1. To perform the situational analysis of for CoVID-19 in India and Globally.
2. To describe the India's preparedness and Response approach on the parameters of WHO Health Emergency and Disaster Risk Management Framework

Methodology

The study is based on the descriptive secondary research taking the baseline of WHO Health Emergency and Disaster Risk Management Framework.

1. A detailed situational analysis of the country is performed by reviewing the database available on government official sites, relevant articles and publications.
2. The country Preparedness and response for COVID-19 management is studied on the parameters of WHO Health Emergency and Disaster Risk Management Framework by a case study formation.

Search Terms: SARS CoV- 2, COVID 19, Lockdown, Outbreak trends, strategies adopted for COVID 19, surveillance etc.

Time Period Taken: 20th March 2020 – 16th June 2020

Results and Discussion

Situation Analysis

The world today is facing a catastrophic pandemic of COVID-19 with the emergence of novel corona virus. Since 31 December 2019 and as of 16 June 2020, **7941791 cases** of COVID-19 have been reported, including **434796 deaths**. [3]

The clinical diagnosis of COVID-19 is likely to be based on clinical symptoms ranging from high fever, dry cough, and shortness of breath to acute respiratory distress syndrome. Few asymptomatic cases have also been identified in family clusters. It was evaluated that 81% of the cases were mild, 14% required oxygen therapy while 5% were critical with multiple organ failure and septic shock.[4]

The case fatality rate in COVID-19 documented to be 3.4% as mean (in age >80 as high as 14.8%), as compared to 10% of SARS-CoV1 and 35% of MERS-CoV. But the Case fatality rate (CFR) would be a misleading indicator without knowing the complete natural course of the disease and the number of total cases due to limited diagnostic and research facilities at the moment.[4]

In an epidemiologist's perspective, definitely two aspects are to be investigated to characterize the pandemic; one is transmission rate and the other is clinical severity. It is imperative to identify pandemic severity index to tackle the situation accordingly. Pandemic severity index should be assessed in the early phase of the outbreak by taking into account transmissibility, seriousness of clinical course and impact of pandemic on health care and societies.

For its laboratory diagnosis, CDC has developed a new laboratory test kit, called as "CDC 2019-nCoV Real-Time Reverse Transcriptase (RT)-PCR Diagnostic Panel. This test is said to be 70% sensitive. Till date no specific pharmacological therapy has been identified. Patients have been treated with symptomatic therapy of Oxygen, antiviral preparations, while hydroxychloroquine also shows some promising results lately. In the absence of vaccines and any known treatment against COVID-19, the mainstay of the control strategies for communities at large, is non-pharmacological measurements namely 'suppression' and 'mitigation' strategies.[5]

1. Analysis of World data

The outbreak intensity varies between different countries and currently the worst affected are United States, Brazil, Russia, India and UK in relation to the case distribution. The World Health Organization statistics depicts that Americas has highest prevalence of COVID-19 cases with a total of 3841609 confirmed cases followed by Europe and rest of the regions.

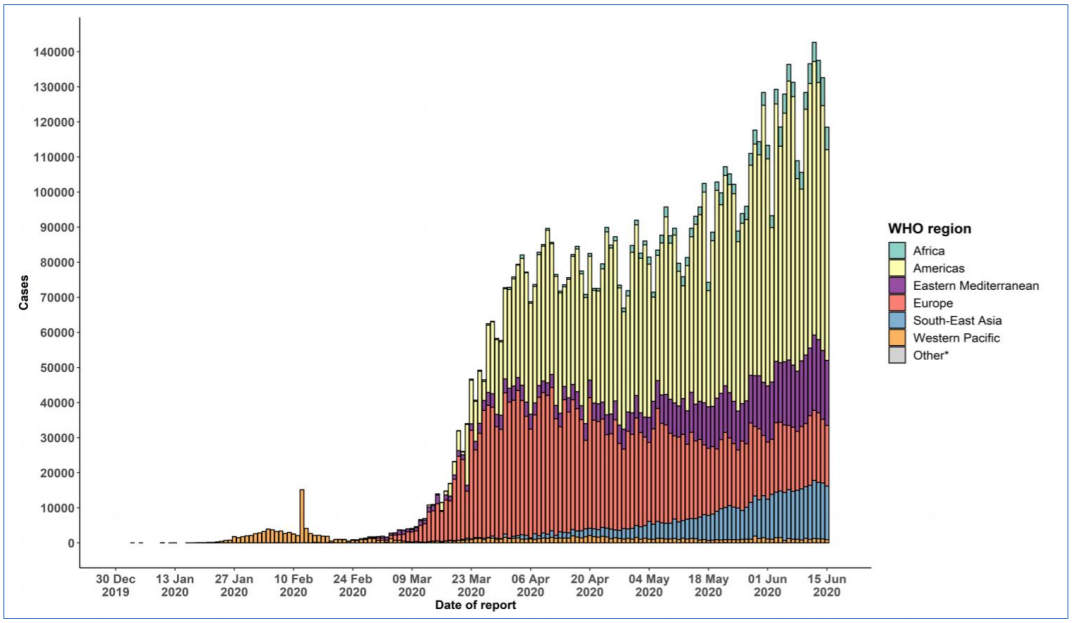


Figure 1: Epidemic curve of confirmed COVID-19, by date of report and WHO region,30th December through 16 June [3]

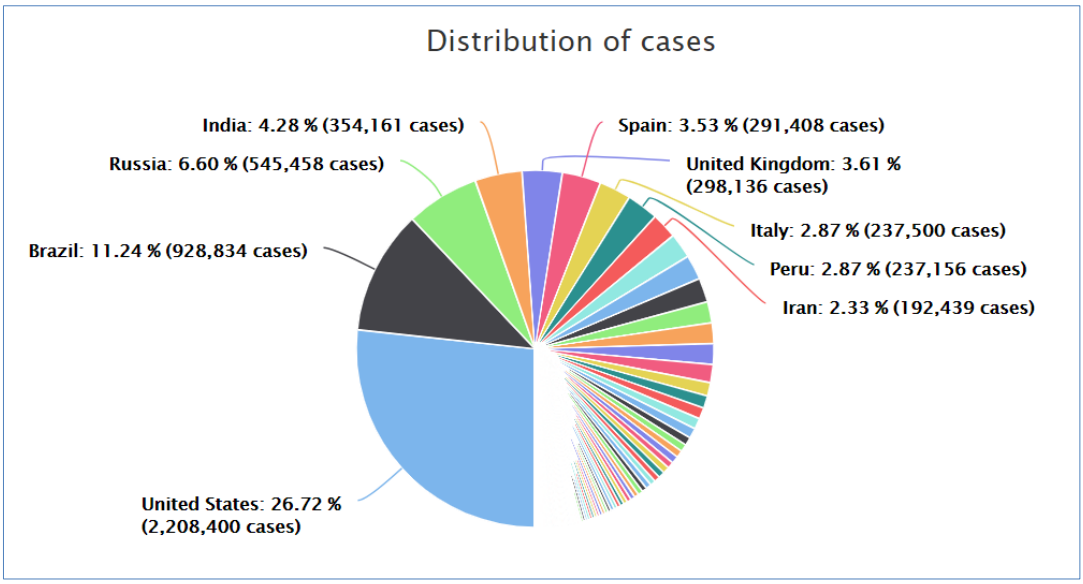


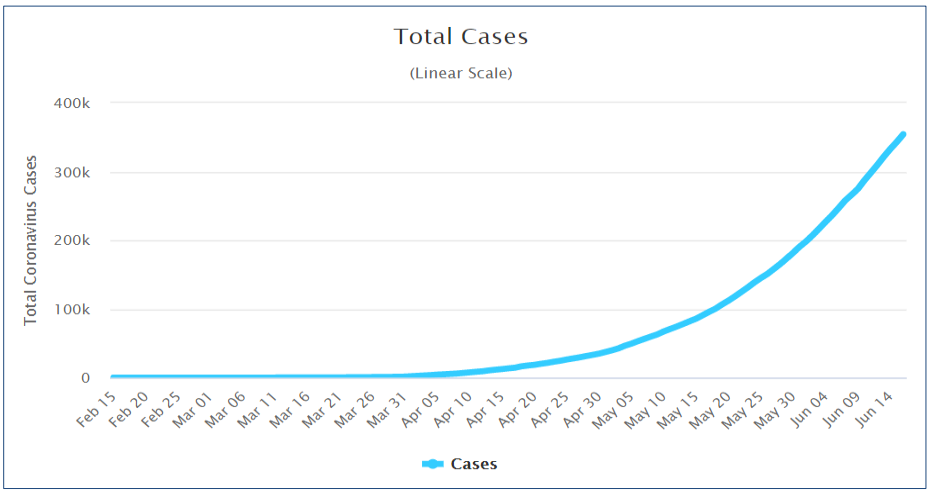
Figure 2: Country wise case distribution highlighting worst affected countries [6]

2. Analysis of India's Performance

As of 16th June 2020, in India, the total confirmed cases were 343 091 and total deaths were 9900 and transmission classification was "Cluster of cases" meaning areas experiencing cases, clustered in time, geographic location and/or by common exposures.[3]

Various measures taken to prevent the spread of virus include partial or complete lockdown, maintaining social distance, travel restrictions, self-isolation for people who suspect they are infected, increasing testing capacities, closing of schools and offices and workplace hazard controls. At individual level, actions recommended were wearing of mask in public setting, maintaining distance from those infected and frequent hand washing using correct technique. Along with these community measures, availability of frontline workers, adequate testing kits, PPEs and other medical supplies and preparedness of health systems have been pivotal to control the spread of virus. India had implemented a nationwide lockdown from March 22 which was extended till 31st May 2020. During this period, every activity in India happened with permission from various administration units.

After enforcing lockdown for a period of 2 months, the government announced a phase wise reopening of the country permitting states to take decisions on resuming activities for the citizens while also barring large public gatherings and religious congregations. This reopening of the country has contributed to significant rise in number of cases.



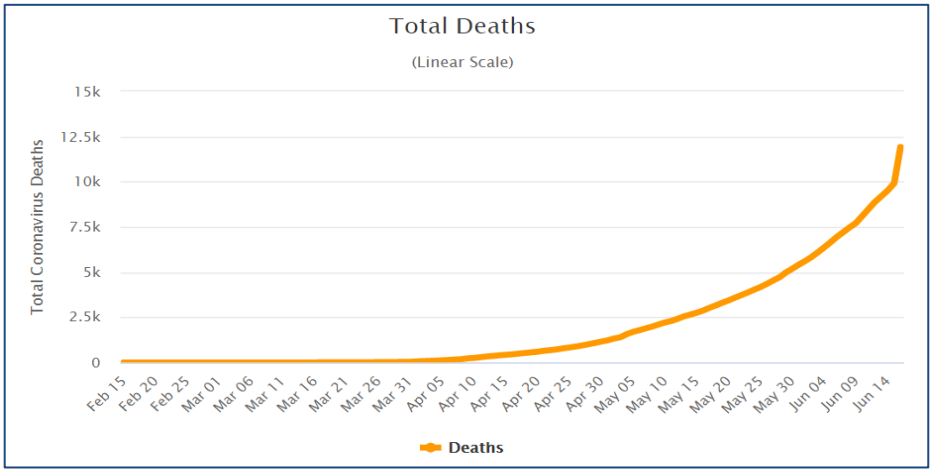


Figure 4: Increase in total COVID 19 cases and total deaths in India as of June 14, 2020[7]

This pandemic has caused global socio-economic disruptions. It led to postponing of events, widespread shortage of essential items supplies and spread of misinformation through social media platforms. Therefore, there is a great need to conduct research through syndromic surveillance and proper case control studies to find out associated risk factors and severe or less severe outcomes.

WHO Health Emergency and Disaster Risk Management Framework

The WHO works with many partners to improve health outcomes of people at risk of a disaster. It supports the implementing country and communities to manage health risk associated with emergencies and disasters. In order to ensure effective utilization and management of resources at the time of disaster, WHO developed the following 10 components of Emergency and Disaster Risk Management Framework: -

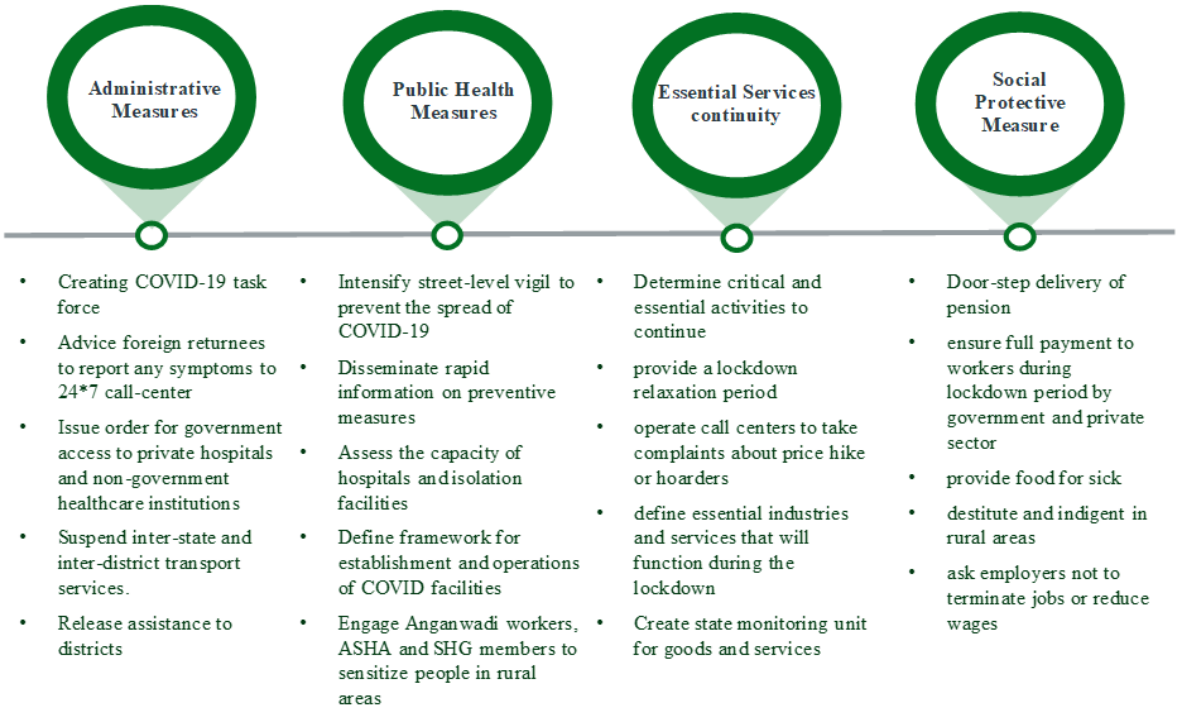
1. POLICIES, STRATEGIES AND LEGISLATION – Strategic planning and policy development. Defining roles and responsibilities of stakeholders.
2. PLANNING AND COORDINATION – Planning and coordination amongst key actors.
3. HUMAN RESOURCES – Planning, Training and capacity building of health workforce
4. FINANCIAL RESOURCES – Ensuring adequate financial allocations for implementation of Health EDRM programs.
5. INFORMATION AND KNOWLEDGE MANAGEMENT – Strengthening surveillance and warning systems.
6. RISK COMMUNICATIONS – Effective risk communication by government and media to people at risk.
7. HEALTH INFRASTRUCTURE AND LOGISTICS – Making health infrastructure safe and prepared for emergencies and improving logistics and supply chain system to prevent shortages.
8. HEALTH AND RELATED SERVICES – Identification of essential services.
9. COMMUNITY CAPACITIES FOR HEALTH EDRM – Strengthening local workforce and community participation
10. MONITORING AND EVALUATION – Standardized indicators to monitor risk, capacities and program implementation

1. POLICIES, STRATEGIES AND LEGISLATION

India's Response

India's central strategy in the fight against nCOV is the "cluster containment strategy" which involves early identification of cases and preventing its transmission and spread.

The Indian states are contributing to aggressively fighting the battle with the virus by coming up with innovative strategies. States are employing the following types of strategic measures [8]:



Some of the State policies and Strategies are as follows:

1. **Kerala**- After reporting the first case of COVID-19 in the country, Kerala was under a great pressure to control the spread of virus. The state which once had the highest number of cases has been able to bring the infection count under control. Kerala upscaled its testing capacities and is following stringent contact-tracing process and publishing of the route map of an infected person. The state also started a "walk-in facility" for safe testing. The Chief

Minister of Kerala addresses the citizens every day ensuring clear risk communication. Moreover, the state has built shelters post nationwide lockdown and is distributing cooked meals to control the movement of migrant workers. Furthermore, the state government has launched the CoronaSafe Network with 2 elements: The Corona Care Centre for converting schools and colleges into hospitals in order to compensate for inadequacies and the Corona Literacy Mission to spread awareness about the nCOV.

2. **Odisha -** This state had emergency precautionary measures already in place as it endures about 25% of India's natural disasters. The cyclone shelters are currently being utilized to house migrant workers. It had imposed statewide lockdown much before the nationwide lockdown was announced and was also the first state to announce the extension of lockdown highlighting the state's readiness for such disasters. Odisha has planned to establish exclusive COVID-19 hospitals in every district. The state is also providing free treatment to all COVID-19 patients. It was the first state to come up with an incentive program by offering INR 15, 000 to all foreign returned on declaring themselves on the government portal. The State is strategically using IT to strengthen their containment plan. Shelter, cooked meals and counseling is being provided to all those in need. More than 7,000 Mission Shakti Self Help Groups of the state are making masks in bulk and protection gear for those on the frontlines to avoid any shortage. They are also running village kitchen centers to cook food for the needy.

3. **Rajasthan -** The Bhilwara district of Rajasthan, once the epicenter of new coronavirus cases in Rajasthan, is now being praised for its containment strategy by the rest of the country. The stringent containment strategy is a mix of strict imposition of full lockdown with the sealing of the borders, mass health screening to detect influenza like symptoms and identification of clusters and mapping of contacts. As many as 2000 teams carried out door to door screening of the entire population and enforced home quarantine to those who were suspected to have been infected. Special Teams were formed in every village including community health workers to ensure that people followed self-quarantine. The government additionally worked on increasing quarantine capacity by readying more than 6000 hostel and hotel rooms in which patients could be quarantined.

4. **Maharashtra** – Presently, Maharashtra has the highest number COVID-19 positive cases in India. It has devised a cluster containment plan to limit the spread of virus and is using

technology as well as traditional patrolling methods for monitoring of densely populated areas. In every district, multiple drones are used to monitor movements on the streets. The state government devised a multi-pronged strategy arrest the spread of infection in Dharavi which is Asia's biggest Slum cluster which includes distribution of hydroxychloroquine, pool testing, door to door screening and converting stadiums and schools into quarantine centers.

2. PLANNING AND COORDINATION

India's Response

Government of India has set up 11 empowered groups for coordination with private and multilateral agencies for COVID-19 related comprehensive and integrated response. This group has been empowered to address the issues pertaining to identifying problem areas, formulating effective solutions, delineate policy and formulate plans. The empowered groups have shared with all stakeholders the government's response so far, need for capacity building, facilitating logistic and supply chain management for medical supplies, medical emergency management plan, availability of quarantine facilities, disease surveillance, communication and public awareness while also connecting various stakeholders for identification of gaps and providing recommendations.[9]

States like Maharashtra have set up committees at state and district level for better coordination between public and private hospitals in tackling the spread of COVID-19. These committees will ensure the availability of medical supplies for healthcare workers and that coordination between government and medical fraternity is worked out for state and district level implementation of all coronavirus-related guidelines by MoHFW and World Health Organization.

3. HUMAN RESOURCES

India's Response

The central government has ramped up measures to ensure the safety and security of the doctors and healthcare workers at the forefront of the fight against coronavirus. Apart from bringing in ordinance to make crime against health workers a non-bailable offence, the government has also brought in a set of measures, set up teams to help and assist health workers. The government has assigned various cadres of personnel and volunteers to ensure the maintenance of essential medical services.

Following the recommendation of empowered group on capacity building based on identification of various COVID related activities, a nationwide database of healthcare professionals and volunteers called **Covidwarriors** has been created for states and UTs to help develop their COVID 19 crises management plan based on human resource available who can be accessed for various activities thus providing help to the elderly, the disabled and orphans. Data of 1.2 Crores healthcare workers and volunteer workforce has already been shared on the dashboard till date.

To cater to the training requirements of the healthcare staff, the GOI has come up with a training module for management of COVID-19 named 'Integrated **Govt. Online training' (iGOT) portal** on Ministry of Human Resource Development's DIKSHA platform to help them acquire necessary skills and knowledge for successfully handling the outbreak. [10] The Courses on this platform have been launched for healthcare workers, government officials and organizations involved in Volunteering work.

The portal provides curated and role specific content needed to tackle the pandemic through any device including mobile phone, laptop and desktop that can be delivered at their place of work or home.

The ministry has also issued a standard operating procedure for allocation of staff for hospital management. A separate team has been created to assist states in cluster containment plan, ICU and ventilator management.

4. FINANCIAL RESOURCES

India's Response

Initially, there was a collective cry by many state governments due to lack of financial support or availability of a specific COVID relief fund from central government for COVID 19 specifically.

Owing to this, the central government okayed Rs 15,000 Crores for 'India COVID-19 Emergency Response and Health System Preparedness Package' to mount an urgent response for containing the spread of the virus in India through development of dedicated treatment facilities and setting up laboratories among others. The fund will be utilized in three phases.

The government created Prime Minister's Citizen Assistance and Relief in Emergency Situations Fund (PM CARES Fund) on 28 March 2020 following COVID 19 pandemic in India. This fund is being used for containment and relief efforts against the coronavirus outbreak and similar outbreak situations in future. The first allocations from the fund was announced on 13th May in which approx. Rs. 2,000 crores were allocated for the purchase of 50,000 ventilators, Rs. 1,000 crores for the support of migrant workers and ₹100 crore was to support the funding of a vaccine for COVID-19.

Testing and treatment for COVID-19 will be free of cost for Ayushman Bharat beneficiaries at empaneled hospitals and private laboratories which would cover over 50 Crores citizens eligible under the scheme. The National Health Authority (NHA), which is the implementing authority of the scheme, has empaneled about 1,500 additional hospitals under the scheme in the past month to meet the load of Covid-19 patients. In addition to this, several state governments have set up dedicated relief funds to accept donations for COVID 19 from individuals and corporates.

The Finance ministry announced a medical insurance of Rs.5 million per healthcare worker with the aim of providing around 2 million healthcare workers with the benefit of the insurance.

The Centre has also recommended the states to make sure healthcare facilities have adequate funds for providing essential services and more funds should be allocated based on facility caseload.

The government also took some general measures such as providing adequate rations for PM Garib Kalyan Anna Yojana beneficiaries, direct benefit transfer related measures for

farmers, MNREGA workers, SHGs, Ujwala scheme beneficiaries etc. and employment related measures in order to mitigate the negative impact of COVID on the lives of people.

5. INFORMATION AND KNOWLEDGE MANAGEMENT

India's Response

The primary surveillance program in India for COVID 19 is Integrated Disease Surveillance Programme (IDSP), a decentralized surveillance mechanism with the objective of strengthening decentralized lab-based IT enabled disease surveillance system to monitor disease trends and to detect and respond to outbreaks in early rising phase. Under the program, a dashboard has also been created which captures live data on logistics, isolation beds, PPEs, resources and manpower. Active surveillance is being done for those suspected to be infected and those who may have come in contact with the infected in the form of contact tracing.[11].

India has built a coronavirus tracker based on mobile location with the name AarogyaSetu. For the first time, the country has introduced a PDS (participatory disease surveillance) model for any disease. The core function of the app is risk assessment, contact tracing and syndromic mapping. The app determines the risk status of the individual and categorizes them as low, moderate, or high. This app can ensure that information about confirmed and suspected cases in the community is available for the community and government.

As many as ten premier research institutions have been allotted funds to study mathematical modelling for Covid-19 and help provide the most probable estimate for the future transmission of the virus in the country. The mathematical models are crucial as they help policymakers to make informed decisions to combat the disease based on the most probable scenarios.

6. HEALTH INFRASTRUCTURE AND LOGISTICS:

India's Response

The government took the following steps to prepare a robust health infrastructure and logistic system to deal with COVID 19:

1. Establishment of simplified purpose-designed governance and coordination mechanisms to complement response protocols.

- On March 12, 2020, the central government invoked the Epidemic Diseases Act, 1897 to take appropriate measures to contain COVID 19 outbreak. All states were advised to invoke the provisions of Section 2 of the Act, which empowers the government to take special measures to "prescribe regulations as to dangerous epidemic diseases".
- The states were instructed form teams in every district for the assessment of delivery of essential services, gap identification and work on reallocation of manpower and rearranging delivery of services.

2. Optimization of service delivery settings and platforms.

- Facility mapping of private, public and non-profit sectors.
- Laying clear guidelines for the states for the involvement of non-government organisations in the provision of non COVID services.
- Setting up of first level 24*7 hospital emergency units, in CHCs to provide non COVID acute care services.
- Encouraging utilization of tele-platforms by patients
- Regular monitoring of portals such as DVDMS to prevent stock out of essential medical supplies.

3. Establish effective patient flow at all levels.

- Entry point screening during triaging
- Setting up of Triaging mechanism.
- Training of healthcare staff to handle patients with influenza like symptoms
- Referral to higher facilities through helplines established by government.

4. Rapidly re-distribute health workforce capacity-Several measures adopted to prevent shortage and skewed distribution.

7. RISK COMMUNICATIONS:

India's Response

Risk Communication is a very complex exercise in India due to the presence of varies dialects and cultures across the country. Naturally, the plan to chalk out a customized crises communication plan for every state and section of the society been a big challenge during the pandemic.

India adopted a comprehensive communication and behavior change interventions strategies involving stakeholders from various backgrounds and disciplines. The primary focus of this communication was on addressing social distancing measures, such as avoiding large social gatherings and lockdown. The government has been actively using Social Media and messaging platforms to improve communication outreach amongst all sections of the community.

But the risk communication in the initial days of the outbreak in India lacked clarity. The early affected states prepared their own state-specific response, while other states such as New Delhi was still unsure of a nationwide strategy. While the state government had started imposing state-wide curfews, a clear direction from the centre only came on 19 March when Prime Minister Narendra Modi called for a Janta Curfew' on 22 March. This announcement again did little to acknowledge uncertainty. Two days later, the Prime Minister announced the complete countrywide lockdown for 21 days, resulting in panic buying situation in several parts of the country. The government abruptly enforced an otherwise much-needed lockdown, without first securing enough public confidence except from a thin urban stratum. Both the messages were high on 'symbolism' but lacked clarity and detailing.

On the contrary, various states, especially Kerala and Maharashtra, implemented a comprehensive and holistic crisis communication strategy by constantly engaging with its citizens by clearly dishing out official statistics and addressing uncertainty of the situation. They also announced precautionary measures to be observed and conveyed the respective governments' action plans through various media channels. Kerala implemented a three-tier communication system, to take directives quickly downstream the organization and execute an action plan. These interactions, though repetitive at times, ensured timely and maximum outreach and, as far as possible, minimized the scope for any undue panic among the public.

8. HEALTH AND RELATED SERVICES

India's Response

MoHFW released the guidelines on "Enabling Delivery of Essential Health Services during the COVID 19 Outbreak" dated 14th April 2020 for provision of essential services. The guidelines also mentioned the health system approach for delivery of these essential services including

1. Facility mapping [12] –
    - Mapping government and non-government health facilities at all levels of healthcare.
    - Identification of essential Non COVID services for continuity of service delivery.
    - Involvement of non-government facilities to provide essential non COVID services where public sector capacity faces a shortfall.
    - Setting up of 24*7 hospital emergency units at CHCs for critical care and obstetric care.
    - Utilization of Mobile Medical Units for services such as follow up care for RMNCH+ services, NCDs etc.
2. Alternate service delivery mechanisms
    - Encouraging utilisation of tele-platforms and apps to prevent overcrowding at the facility.
    - Modified Outreach for services like disease screening and ante natal care and utilization of Peripheral facilities such as SHCs, PHCs and HWCs for this.
    - Optimization of Home-visits by community health workers for providing healthcare services to high risk beneficiaries while maintaining social distancing norms.

3. Triaging -
    - Establishing triaging mechanisms at all healthcare facilities.
    - Training of frontline health workers in protocols for screening, isolation and triage

- Reporting rise in cases of infectious disease with fever as a symptom.

4. Management of HR:
    - Redeploying staff from non-affected areas and facilities and mobilise resources from other areas like Railways, PSUs, ESIC etc.
    - Hiring private doctors, AYUSH doctors and dentists for COVID and essential non COVID services.
    - Filling the vacancies which are already there.
    - Accelerated training of medical, nursing, and healthcare workers using web-based portals and apps.

5. All frontline health care workers need to undergo training in SOPs for Infection Prevention Control and precautions to be followed when dealing with patients or sample irrespective of symptoms and have to adhere to advisories for infection prevention, personal protection and physical distancing norms, for facility level care, outreach visits or home-based care. Provision of sufficient masks, gloves and other personal protective equipment to health workers must also be ensured.

9. COMMUNITY CAPACITIES FOR HEALTH EDRM

India's Response

Community participation is an important pre condition for successful risk communication, which involves constructively communicating the threats because of virus, inspiring correct health practices, and tackling rumors. As the virus spreads to rural areas, intensified testing and associated quarantine, isolation and treatment activities will burden our public health system. Therefore, it would be difficult to contain the spread of virus without community participation.

The Women self-help group in India is one such example of community participation which has risen to the challenge of COVID 19 pandemic.

In over 90 percent of India's districts, away from the limelight of the cities, SHG women are producing facemasks, running community kitchens, delivering essential food supplies, sensitizing people about health and hygiene and combating misinformation.

In Kerala, the Kudumbashree network, one of the country's oldest community of women consisting of more than 4 million members were the earliest to start mass production of masks. They also possess many years of catering experience which is now being utilized by the state government to provide meals to poor. Similarly, in Jharkhand, SHGs are helping district administrations identify pockets of hunger and starvation and helping to run a dedicated helpline for returning migrants and other vulnerable families working in the parts of the country back to the state.

They are helping to curb rumor and spread awareness using their vast networks via tele counselling helplines. In Kerala, Kudumbashree are raising awareness about hand hygiene and social distancing through mobile phones, IEC materials and regular meetings. In Bihar, Jeevika, the state's SHG platform is spreading the word about hand washing, quarantine and self-isolation through leaflets, songs, videos and phone messages.

SHGs women working as banking correspondents(*bank sakhis)* have emerged as a vital resource to provide doorstep banking services to far-flung communities.

10. MONITORING AND EVALUATION

India's Response

Due to increase in COVID-19 cases in India, state governments are implementing strict monitoring mechanisms to ensure that those quarantined stay at home. Globally, Technologies like geotagging is helping health and government officials in monitoring active cases and spread of diseases.

In Kerala, contact tracing involves health workers who go door to door and use CCTV footage for tracing the movements of positive patients. Karnataka and Telangana are using apps with geotagging features to closely monitor home quarantine. Telangana is using

TSCop app to geotag houses of foreign returns, linking it to its patrolling officers. Karnataka has partnered with Infosys to develop an interactive voice response system (IVRS), with daily calls to those quarantined at home.
The government has made an action plan for strengthening of surveillance network to monitor the spread of COVID-19 in India utilizing the services of WHO's national polio surveillance network team. Ministry of Health and Family Welfare, India and World Health Organization-South-East Asia initiated a systematic engagement of the WHO's national polio surveillance network, and other field staff, for India's COVID-19 response, tapping into the best practices and resources that helped India win its war against polio.

Conclusion

A SWOT Analysis of the current nCOV situation in India based on the study shows the following:

Strengths:

- Rapid measures undertaken to contain the spread of virus such as imposing travel restrictions and lockdown.
- Mandating thermal screening checks for travellers and at offices and other public places.
- Presence of a strong pharmaceutical industry for research, manufacturing and export of drugs.
- Development of strategies for availing adequate health infrastructure, manpower and logistics to prevent shortages.
- Leveraging innovation and technology to improve health outcomes of COVID 19.

Weaknesses:

- Even though India has adopted several strategies to combat the spread of virus, it is important to work upon improving its testing policy.
- India faces a challenge in the manufacturing of testing kits and relief material indigenously, making us dependent on imports.
- Lack of spread of awareness in some parts of the country especially in rural India.

- Unavailability of proper channels to identify current financial needs of states for the allocation of COVID funds.
- Unclear risk communication by the government causing fear and confusion amongst people.
- Shortage of emergency healthcare infrastructure and professionals -
    - Doctor to patient ratio: 1:1445
    - Hospital beds to people ratio: 0.7:1000
    - Ventilators to population ratio 40000: 1.3bn

Opportunities:

- Development of strong third-tier governance system (panchayat level, similar to Kerala's governance model) for educating and monitoring people.
- Carrying ahead intellectual repository created to fight the crisis into the post-pandemic world.
- Making use of R&D ecosystem for rapid development of COVID-19 vaccine/antidote
- Making use of start-ups, MSMEs and Indian labs for the productions of PPEs, testing kits, ventilators, etc.
- Increase the frequency and reach of awareness campaigns to educate and help people overcome psychological barriers.

Threats:

- Failure in contact tracing may lead to worsening of the present situation and increase in the probability of being hit by the second wave of covid-19.
- Higher chances of frontline workers contracting the disease and thus crumbling the already fragile manpower availability.
- Breach of lockdown protocols and social-distancing norms

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