COVID-19
Global and National Response
Lessons for the Future

Independent Commission on Development & Health in India

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Authors

Amit S Ray
Professor of Economics, Center for International Trade and Development,
Jawaharlal Nehru University

Ajay Pandey
Professor of Law & Executive Director, Clinical Programmes,
Jindal Global Law School

Bhavna B Mukhopadhyay
Chief Executive
Voluntary Health Association of India

Deepak Gupta
Former Additional Secretary (Health), Government of India;
Former Chairman, UPSC

J.V.R. Prasada Rao
UN Secretary General's Special Envoy for AIDS, Asia & the Pacific;
Former Secretary, Ministry of Health and Family Welfare, Government of India

Jo Shepherd
Research Officer, National Centre for Rural Health and Care, UK

Maurice Barry Mittelmark
Professor Emeritus, Department of Health Promotion and Development,
University of Bergen, Norway

Manmohan Agarwal
Former Professor of International Economics, Jawaharlal Nehru University;
Former RBI Chair, Centre for Development Studies

Madhumitha Balaji
Wellcome Trust/DBT India Alliance Early Career Fellow, Sangath

Dr. M M Singh
Director & Professor, Department of Community Medicine,
Maulana Azad Medical College, New Delhi

Dr. Navya Gangadharan
Post Graduate Researcher,
Department of Community Medicine,
Maulana Azad Medical College, Delhi University

Dr. Nidhi Bhatnagar
Associate Professor, Department of Community Medicine,
Maulana Azad Medical College, Delhi University

Pinaki Mitra
Executive Director, Sangath

Dr. P. C. Bhatnagar
Senior Director(Programmes), VHAI

Richard Parish
Professor Emeritus, University of Chester, UK;
Executive Chair, National Centre for Rural Health and Care, UK;
Co-Investigator, MRC PETRA Programme on Trade and Health

Dr. Sagar Galwankar
Chief Executive Officer, INDUSEM;
Associate Professor & Director for Research in Emergency Medicine, University of Florida;
Sarasota Memorial Hospital New Delhi

Shanta Lall Mulmi
Executive Director, RECPHEC, Nepal

Dr. Suneela Garg
Director & Professor, Department of Community Medicine, Maulana Azad Medical College, Delhi University

Dr. S K Raina
Professor & Head, Department of Community Medicine,
Dr. Rajendra Prasad Government Medical College Kangra at Tanda (HP)

S.Y. Quraishi
Chairman, Centre for Ethical Life & Leadership;
Former Chief Election Commissioner of India

Dr Vinya S Ariyaratne
General Secretary, Sarvdaya;
Lecturer, Community Medicine, University of Sri Jayewardenepura, Sri Lanka

Dr. Vikram Patel
Professor, Department of Global Health and Population,
Harvard TH Chan School of Public Health;
Co-Founder, Sangath

Independent Commission on Development and Health in India

Convener

Alok Mukhopadhyay

Members

Javid A. Choudhary
Former Secretary, Ministry of Health and Family Welfare, Government of India

Dr. L. M. Nath
Former Director, All India Institute of Medical Science, Delhi

J.V.R. Prasada Rao
UN Secretary General's Special Envoy for AIDS, Asia & the Pacific;
Former Secretary, Ministry of Health and Family Welfare, Government of India

S.Y. Quraishi
Chairman, Centre for Ethical Life & Leadership;
Former Chief Election Commissioner of India

Deepak Gupta
Former Additional Secretary (Health), Government of India;
Former Chairman, UPSC

Amit Shovon Ray
Professor of Economics, Center for International Trade and Development, Jawaharlal Nehru University

Darshan Shankar
Vice Chancellor, Institute of Trans-Disciplinary Health Sciences and Technology

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Preface

NATIONAL RESPONSE

Preface

COVID-19 has caused worldwide human, economic and social misery. It clearly exposed the vulnerability of our civilisation, and reinforced the importance of living in harmony with nature, not rampaging it in a conquering mode. In a post-COVID world, we must thoroughly internalise the lessons from the pandemics.

The most accepted definition of Health is, "State of complete physical, mental and social wellbeing, not just absence of disease", as enshrined in WHO's Constitution, adopted in 1948. Unfortunately, during the management of COVID-19, our focus has mostly remained in combating the disease. We failed to ensure that in that process other crucial elements of health are not damaged. We have remained in this mode till now, causing economic hardship to millions of people, compromising the management of other health challenges, as well as distorting the education and other essential facets of humanity. We must ensure that operation COVID-19 does not succeed at the cost of damaging the foundation of our civilisation.

During the crisis, it became evident that scientists advice and politicians decide. The situation get more complicated when the scientists involved are largely clinicians, not experienced public health professionals and epidemiologists. We have seen with considerable consternation how very powerful politicians overruled the scientific advice and took decisions, which adversely affected the sound management of the disease. In the United States, politically motivated unscientific stand of the leadership led to the worrying situation that it faces today. Similarly, in many countries, including India, a sudden lockdown was imposed on the whole country without adequate preparation. It is now clear that the sledgehammer approach of sudden lockdown of the countries is not the best solution. It is better to use a strategy of using localised strategic lockdown, like a jeweller's mallet.

Within couple of months of the outbreak of COVID-19, there was enough scientific knowledge about the disease and the effective way of managing it. Early diagnosis through testing the suspected cases, comprehensive contact tracing, home quarantine of mild and moderate cases with active follow-up, timely hospitalisation of the serious cases and protecting the elderly patients with co-morbidity, are the proven shield. Every country, which implemented these measures efficiently and managed to educate their population to follow the basic guidelines of hand-washing, social distancing and mask wearing, came out with significantly better outcomes. But unfortunately, many of these countries let their guards down too soon, which caused re-emergence of cases in most of Europe and elsewhere.

Now with the successful vaccines in the horizon, this nightmarish chapter might come to an end, but we need to deeply internalise the lessons of this

tough journey and prepare ourselves adequately for the future. The Report is an attempt to capture our experiential learning while combating the grim reality of COVID-19.

During this crisis, the fault lines of the health systems all over the world became clear. They can be summarised as follows:

I.   In most countries, human resources in health sector are inadequate. The problem is not only limited to developing countries, but also in developed countries going through demographic transition. A long-term solution of this critical problem need to be evolved with a sense of urgency.

II.   In the developing countries, both financial resources and health infrastructures are awfully inadequate. It is evident that a country's economic, social as well as political stability depends on the investment that it make in their health care. Health budget should not be treated as an expenditure, but an essential investment for sustainable development.

III.   A few years back, the WHO took initiative to highlight the importance of addressing the Social Determinants of Health, but not much action followed. The pandemic showed how more than one third of the global population, living in urban slums and rural settlements without proper infrastructure have hardly any chance to preserve themselves from the spread of the communicable diseases. Underbelly of all urban centres showed how little we have done in improving the living conditions of the economically disadvantaged.

        The crisis highlighted the vulnerability of the people working in unorganised sector. They lost their livelihood overnight due to sudden lockdown and had to undertake long inhuman journeys to their native places for their survival, during this tough phase. Similarly, a huge number of self-employed people lost their livelihood. It is imperative that we systematically address the challenges of social determinants of health, to ensure the health and development of whole population.

IV.   In the management of the pandemic, the government infrastructure played the most critical role reinforcing our belief that health is a merit good and should not be totally put in the market place. The government health systems should continue to be the backbone of health services.

V.   The pandemic brought to light the importance of the slogan, "All for Health". At the end of the day, not only the health professionals but civic and police administration as well as others had to work collectively to combat the spread of the disease. Unfortunately, the non-health actors in most countries are not trained in the basics of health care.

We need to ensure that during the initiation to the service all cadres of government and non-government organisations' go through simple training on basics of health and wellbeing.

VI.   In the management of the pandemic, the participation of the communities was limited. Our efforts would have been far more effective, if we had involved them right from the planning stage and ensured that they continued to play important role in decentralised management of the disease. Similarly, efficient mechanism for active participation of non-government organisations were not created. We have seen in the past, during global outbreak of HIV/AIDS, how much value they add to the government effort, if an enabling environment is created.

VII. The resistance of the citizens all over the world to simple preventive steps like using of masks or maintaining social distancing, brought to the light the fact that preventive and promotive health care should be an important health agenda for the future, so that our citizens practice the basics of healthy living.

We need a strong global weather station to pro-actively monitor the emerging health emergencies, sufficiently in advance so that vulnerable nations can get time to prepare for it. The WHO is supposed to play this role but somehow in the recent years, it's not so pro-active response to the outbreak of Ebola and similar situations have dented it's credibility. Obviously, there is a need for a paradigm shift in the WHO, so that it can be an energetic organisation developing strong collaborative arrangements with well-respected scientific institutions with proven track record. This will help the WHO not only rely on the professional knowledge available within the organisation, but enthusiastically obtains best scientific and technical advice that exists globally. The WHO has the advantage of global acceptance due to its contribution for many decades, as well as its presence all over the world. The organisation should be run by committed professionals, rather than job seekers and political appointees.

At present, the WHO is hesitant to raise issues with strong member countries. During the management of COVID-19, it was found to be going questionably soft on China for quite a while, appreciating their response to the outbreak, rather than pointing out Chinese government's denial and mismanagement of the pandemic during early weeks.

The present international laws binding the governments on the reporting of life threatening diseases, which has global consequence, are rather weak. Time has come to frame stricter international laws, which makes it mandatory for Member States of the United Nations to report such incidents promptly, so that it does not lead to far graver situations with global ramification. Similarly, most countries need to review their Laws which are evoked during

the pandemic. They were found to be deficient, not far reaching; and have little accountability to the public grievances. During the crisis, the need for creating an International Fund to promptly respond to such situations was felt badly.

The crisis sadly exposed that the benefits of globalisation does not come to active play when such disasters strike. Even otherwise organised European Union failed to respond to this crisis jointly during its' peak. On the other hand, Indian vaccine distribution to its neighbours and other countries stood out as a shining example of global cooperation. In the future, we need to develop mechanism for horizontal integration of response to the crisis of global proportion.

Due to the pandemic, the education system has gone through traumatic change resulting in dropout of millions of children throughout the developing world who are not beneficiaries of digitalisation. Many of them are going back to child labour. In many places, attending the school ensured a nutritious meal for the children. They are deprived of that now. We need to remember that education is not only about acquiring knowledge, but also understanding of the society through socialising with larger peer group, interacting with people, having access to sports, as well as other forms of culture and entertainment. It is essential that we find ways and means to open our educational institutions at the earliest with enough precautions.

We had to rethink of our work settings. In the long run, we need to figure out a system where people can work from home without compromising their productivity. This will have benefits of reducing traffic congestion, pollution as well as infrastructural fatigue. On the other hand, people for whom it is essential to attend work settings, we need to create healthier and safer work places, where they are least exposed to health hazards.

With physical contacts kept to a minimum, it is digital communication that proved to be a lifeline for the society across the world. We use internet to learn, to work, to communicate as well as to socialise. The pandemic and the subsequent lockdowns, not only compelled change in the mode of social interaction, but also the running of businesses. However, it has rushed into digital life at a velocity which was unfathomable, while only 27 per cent of families in India have access to internet. There is a huge digital divide between the urban and rural areas. We need significant push towards digitalisation both from the government and the private sector, to fill this unacceptable gap.

We are gradually coming out of this unimaginable crisis due to dedicated work, under most trying circumstances, by millions of health functionaries in all kinds of settings. In the initial phase, many of them had to work round the clock in an unknown territory without sufficient safety precautions.

Their brave dedicated response has shown how much latent potentiality is there in our human resources for health. We need to appreciate, nurture and compensate them adequately.

The scientists working in the vaccine front have almost done a miracle by coming out with effective vaccines in such a short time. They have added a glorious chapter in the history of science. Besides them, many political leaders and brave hearts from the public played a key role in pushing back this crisis.

We are at a time when health has at last received its due importance in the global development agenda. The initiatives like Macroeconomics Commission on Health, Global Fund, World Bank and Private Foundations' considerable investment in health sector, as well as in the agendas of Sustainable Development Goals; are some of the important expression of this concern. We are certain that post-COVID-19, the health care will receive further fillip, but favourable wind is of consequence if direction of the boat is right. The greatest economic force now sweeping through the health care system worldwide is that of the market. Health is a vital human good and medicare plays a key role in promoting it. Totally commercialising it even for the sake of choice and efficiency, runs a potent risk of submitting it to the market forces. The integrity of medicine itself is at stake. The State need to remain the principal provider of health care to safeguard it from this folly.

We need to look at the financial outlay that is required to meet the unfinished agenda of 'Health for All'. Most developing countries, including well performing economies, like India and China, invest far less than it is required to meet their health goals. Paradoxically, the cost of providing basic health care to the world's unreached population need an investment of up to 35 billion dollars, which is a fraction of 400 billions dollars that the world spends on armaments annually. This is particularly pertinent in the context of the fact that one of the most striking statistics is that a woman will die from complication in pregnancy in Sub-Saharan Africa 1 in 37 over the course of her lifetime, compared to 1 in 6,500 in the developed world.

A healthy nation is the sum total of the health of its citizens, communities and settlements in which they live. Therefore, it is only feasible if there is total participation of its citizens towards this goal. We have to look beyond the so-called predominantly reductionist bio-medical model of health care, to a holistic model of health care, which puts the human and the environment in the centre.

Alok Mukhopadhyay
Convener
Independent Commission on Development and Health in India

Photo Source Istock

Global Response
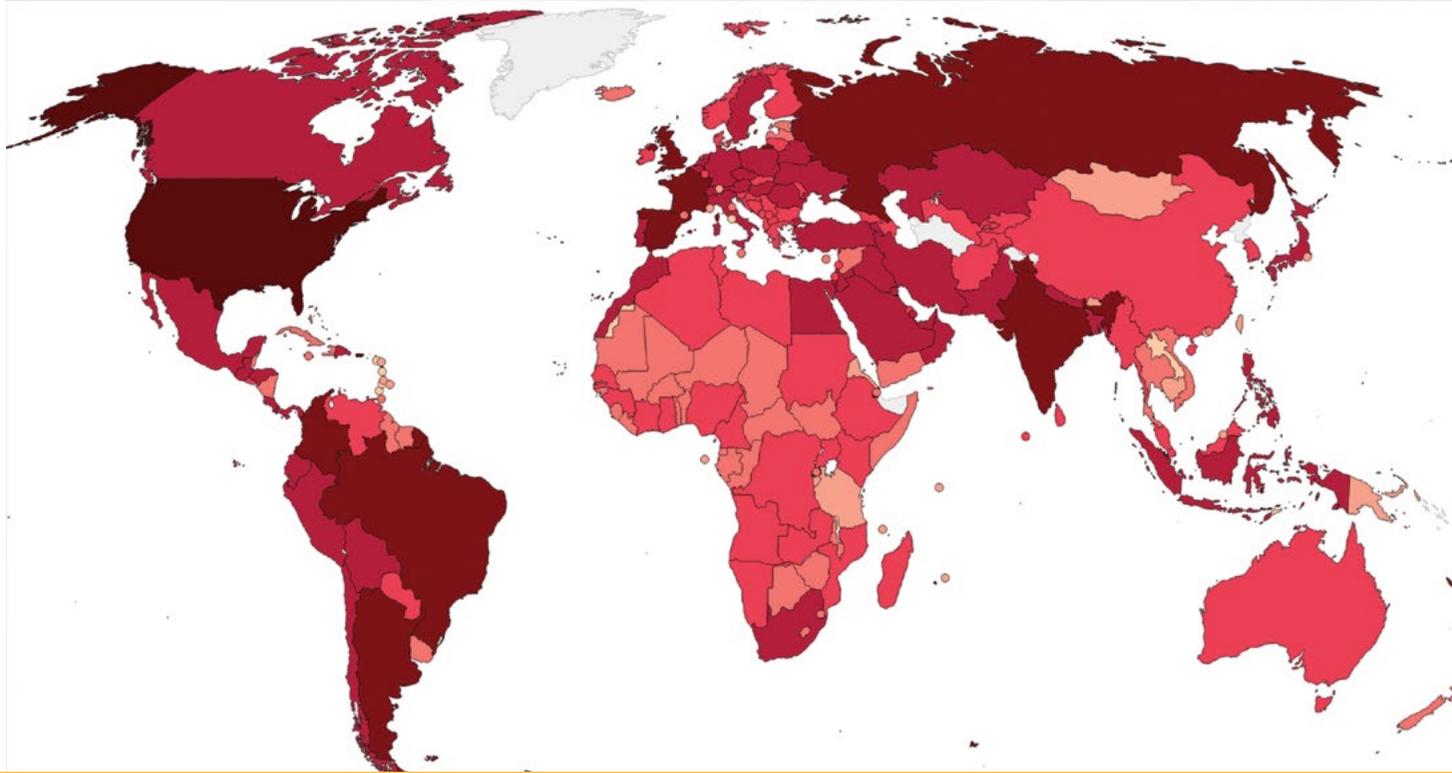
An Inter-Country Comparative Analysis of COVID-19 Outcomes

Introduction

The COVID-19 pandemic spread to the entire world by the first quarter of 2020, forcing countries to follow various containment models. While India, the USA and most of Europe chose complete or partial lockdown of their socio-economic institutions, to protect their citizens from the pandemic; there are countries that did not apply any form of lockdown. Instead, they have been trying strategies like contact tracing as in the case of South Korea and individual responsibility, as seen in the case of Sweden.

During the first quarter, most countries in Africa and Latin America were not as affected as Asia, Europe and North America. However, the trend changed for worse as newer countries, especially in South America, were engulfed by significant number of COVID-19 confirmed cases and mortality. India witnessed a sharp and exponential increase in its COVID-19 cases post May 2020, as the country started easing the world's biggest lockdown.

The following is a comparative analysis of about 165 countries from around the world, to evaluate the COVID-19 spread and fatality as of 30 September 2020. Nations for which COVID-19 related demographic data is available, further correlations have been analysed to draw some meaningful patterns.

Overview of COVID-19 for some of the Most Impacted Countries Globally

Table 1.1 evaluates the country-wise COVID-19 positive cases and mortality, compared to the national population. It also tabulates the date of confirmation of the first case in each country.

After being discovered in China, the first international COVID-19 positive case was confirmed in Thailand on 13 January, 2020, followed by Japan, i.e., on 16 January 2020. By 31 January 2020, all the other studied nations had officially confirmed their respective first cases and had started restricting international travel.

S.No.	Country	Total Population (1 July 2019)	Date of Confirmation of First Case	Total Confirmed Cases (30 September 2020)	Total Deaths (30 September 2020)	Case Fatality Rate (%) (30 September 2020)
1	USA	329,064,917	20 January	7,077,015	203,875	2.88
2	India	1,366,417,754	30 January	6,225,763	97,497	1.57
3	Brazil	211,049,527	26 February	4,745,464	142,058	2.99
4	Russia	145,872,256	31 January	1,176,286	20,722	1.76
5	Colombia	50,339,443	6 March	818,203	25,641	3.13
6	Peru	32,510,453	7 March	808,714	32,324	4.00
7	Spain	46,736,776	31 January	765,291	31,762	4.15
8	Mexico	127,575,529	28 February	733,717	76,603	10.44
9	South Africa	58,558,270	5 March	672,572	16,667	2.48
10	France	65,129,728	24 February	526,435	31,691	6.02
11	Iran	82,913,906	19 February	453,637	25,986	5.73
12	UK	67,530,172	1 February	446,160	42,072	9.43
13	Bangladesh	163,046,161	8 March	362,043	5,219	1.44
14	Italy	60,550,075	29 January	313,011	35,875	11.46
15	China	1,433,783,686	4 January	91,041	4,746	5.21
16	Japan	126,860,301	16 January	83,010	1,564	1.88
17	Australia	25,203,198	25 January	27,063	882	3.26

TABLE 1.1: Total Population and COVID-19 Updates of the Most Impacted Countries Globally

As of 30 September 2020 at 7,077,015, the USA had the highest number of total confirmed cases of which 203,875 persons had deceased. The USA was being closely followed by India in terms of total confirmed cases, and the cases shot the roof as the lockdown eased and testing increased. However, the mortality rate for India is among the lowest in the countries listed in Table 1, quite a feat, considering the considerably weak public health system of the country. India, the world's second-most populated country, went under total lockdown on 24 March 2020 which was undone in phases, June onwards.

Surprisingly, Bangladesh, one of the world's most densely populated countries and a neighbour of India and China, registered just 362,043 confirmed cases with a case fatality rate of 1.44 per cent. The confirmed cases are much lesser than the U.K., France, Spain and South Africa, all of which have less than half of Bangladesh's population and supposedly stronger health systems.

Further, as per Table 1, three of the top six most infected countries are located in South America - Brazil, Colombia and Peru, and two of the top six are in North America - the USA and Mexico. While the USA was among the most severely infected nations right from the first quarter of the COVID-19 spread, the other New World nations caught up in the later months.

Despite the stringent national lockdowns, Spain, Italy, the U.K. and France each had more than 300,000 confirmed cases, with Spain going as high as 765,291. These countries also witnessed high mortality, with their case fatality rates ranging between 4 to 11 per cent, highest being of Italy at 11.46 per cent.

Considering the population, Japan as well as China seem to have been successful at keeping the cases and fatality under control. While Japan focused on behavioural change without implementing a complete lockdown, China has been the pioneer of stringent lockdown methodology. The countries have noted 4,746 and 1,564 COVID-19 deaths respectively. However, the case fatality rate of China is considerably high (5.21 per cent). Both the countries registered a second wave of infections in June 2020, details of which have been discussed later.

Region wise COVID-19 Distribution

I. Asia

The current study has covered 45 countries in Asia for a comparative analysis of their total confirmed cases of COVID-19, as of 30 September 2020. The continent has been further divided into four geo-political regions to arrive at a more nuanced understanding of the situation.

1. East and South East Asia

Of the 16 countries located in East and South East Asia, Philippines has confirmed the most COVID-19 cases (309,303), closely followed by Indonesia (282,724). Both the countries are densely populated, with Indonesia being the fourth largest country globally in terms of population.

China, despite being the most populated country in the world and the place of origin of COVID-19, has officially confirmed just 91,041 cases since January till September. These

Graph 1.1: COVID-19 Confirmed Cases (East and South East Asia)
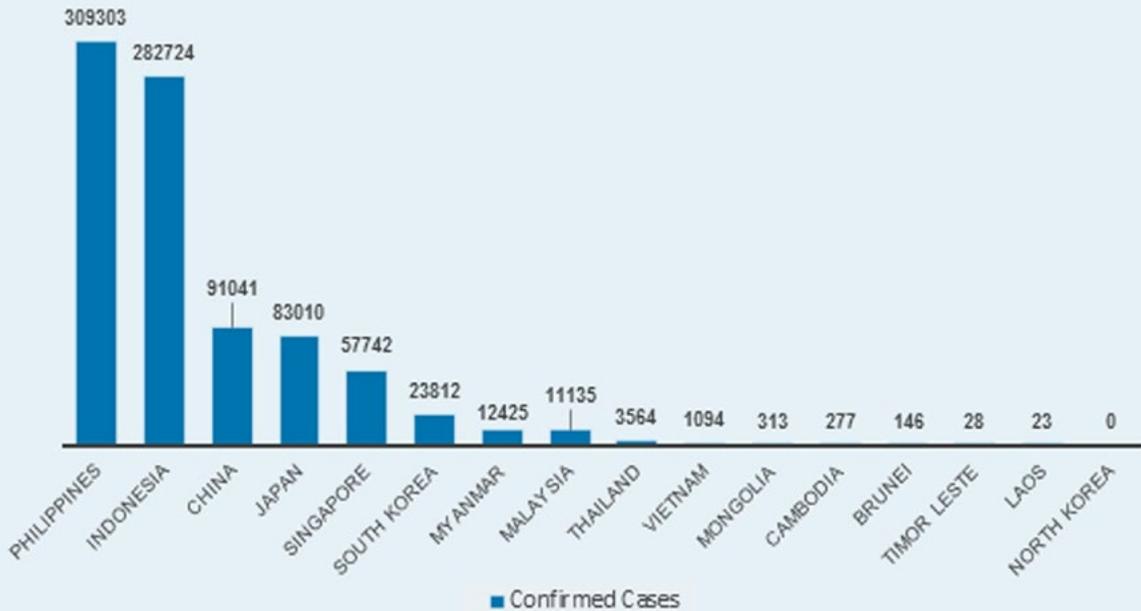
Source: WHO; till 30 September, 2020

controlled numbers have been attributed to the strict implementation of lockdown in the country, followed by even more stringent regional lockdowns when new waves of infections emerged post May 2020. The country used technology, as well as citizen data to track movements and restrict the spread of infections. The strategy has been discussed in more detail in the later chapter.

Singapore is smaller population wise as compared to countries such as Viet Nam, Thailand, Malaysia, Myanmar and South Korea. However, it has registered a much higher number of confirmed cases. Following immigrated cases from China in January, Singapore had registered sizeable cluster based infections in February-March 2020. This was followed by its overseas citizens and residents returning from around the world. In

April-May, clusters were detected in migrant workers' dormitories. Mid- August onwards, the country has mostly been registering community based transmission cases, with a daily rise of a nominal number of cases. The case fatality rate of Singapore at 0.05 per cent is among the lowest in Asia. No data is available for Democratic Republic of Korea (North Korea).

2. **South Asia**

India is the most populated and the most infected country in the sub-continent region, with 6,225,763 cases confirmed as of 30 September, 2020. Bangladesh and Pakistan have similar number of confirmed cases, each having about 5-6 per cent of the total cases confirmed in India, while having about 12 and 16 per cent of the population of

Graph 1.2: COVID-19 Confirmed Cases (South Asia)

Country	Confirmed Cases
INDIA	6225763
BANGLADESH	362043
PAKISTAN	312263
NEPAL	76258
AFGHANISTAN	39268
MALDIVES	10194
SRI LANKA	3374
BHUTAN	281

■ Confirmed Cases

Source: WHO; till 30 September, 2020
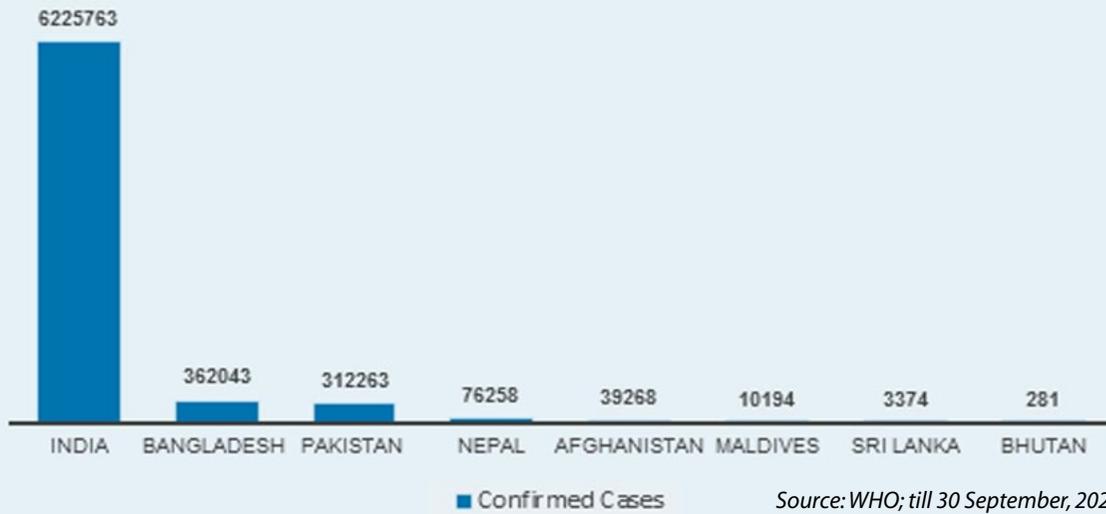
India, respectively. This implies that the two neighbouring countries have fared better in terms of proportion of population impacted by COVID-19.

Surprisingly, the small island country of Maldives has more number of cases than the larger Sri Lanka. Bhutan has registered the

least number of COVID-19 cases in this region, probably attributed to the size of the country.

3. **West Asia**

In West Asia, Iran has confirmed the most cases, closely followed by Iraq, Saudi Arabia and Turkey. Iran was in fact one of the most severely

Graph 1.3: COVID-19 Confirmed Cases (West Asia)

Country	Confirmed Cases
IRAN	453637
IRAQ	358290
SAUDI ARABIA	334187
TURKEY	317272
ISRAEL	233459
QATAR	125533
KUWAIT	104568
OMAN	98585
UAE	93090
BAHRAIN	70422
ARMENIA	50359
AZERBAIJAN	40119
LEBANON	38363
JORDAN	10049
SYRIA	4148
YEMEN	2035

■ Confirmed Cases

Source: WHO; till 30 September, 2020

**Graph 1.4: COVID-19 Confirmed Cases
(Central Asia)**

Source: WHO; till 30 September, 2020
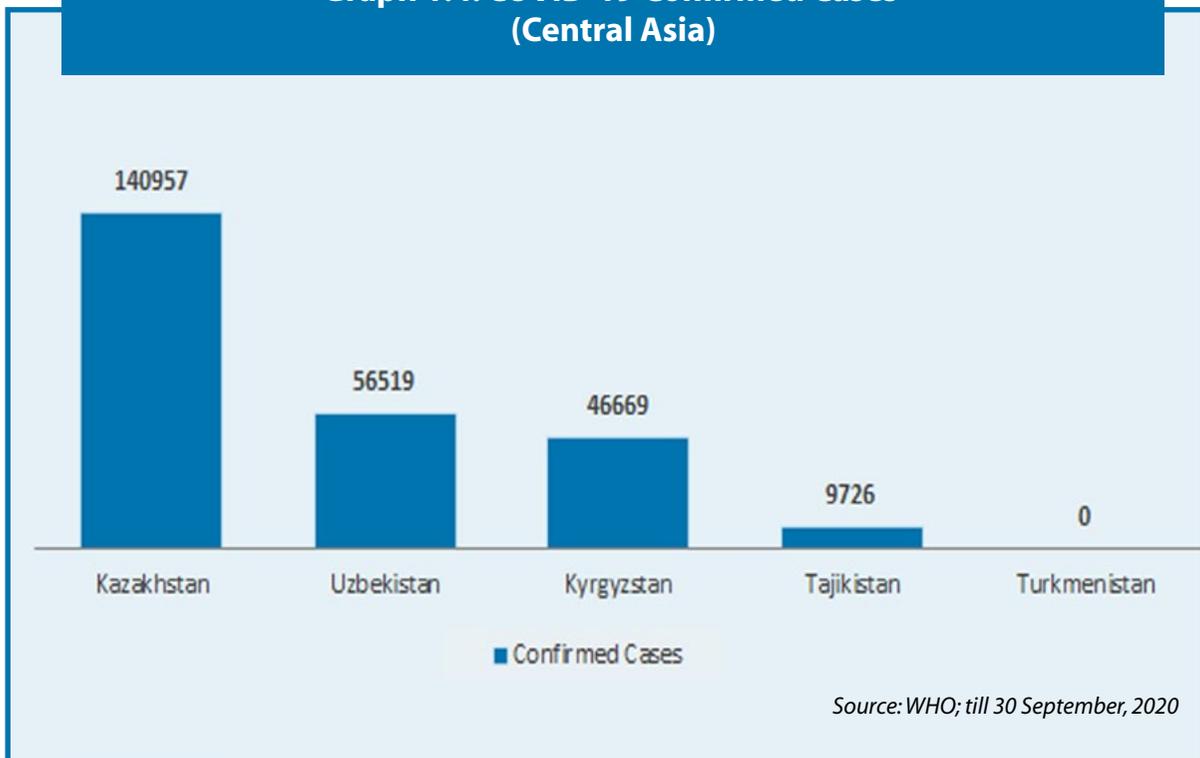
impacted countries, within the first couple of months of the spread of COVID-19. Almost all the countries in this region have been significantly infected, including the smaller ones. Qatar, Kuwait and Oman are considerably less populated than UAE, but have confirmed higher infections. Syria and Yemen have the lowest cases in the region. However, they have the highest case fatality rates in the region. In fact Syria has globally the highest case fatality rate.

4. **Central Asia**

Among the five countries in Central Asia, Kazakhstan has the highest number of confirmed cases. Uzbekistan and Kyrgystan have about half the number of the cases. In fact, Uzbekistan has double the population of Kazakhstan, but had less than half the

confirmed cases than the latter. No data is available for dictatorship Turkmenistan.

II. **Europe**

The current study has covered 38 countries in Europe for a comparative analysis of their total confirmed cases of COVID-19, as of 30 September 2020. The first graph visualises the confirmed cases in West, North and Baltic Europe, while the second graph gives a picture of the confirmed cases in Central and East Europe.

1. **West, North and Baltic Europe**

Among the top 5 most infected countries, Germany has the highest population but has the least number of total confirmed cases. Spain, on the other hand, has the lowest population among the five, but is on top of the

Graph 1.5: COVID-19 Confirmed Cases (West, North and Baltic Europe)

765291 — Spain
526435 — France
446160 — UK
313011 — Italy
289219 — Germany
122149 — Belgium
117420 — Netherlands
93165 — Sweden
74717 — Portugal
52751 — Switzerland
44607 — Austria
35740 — Ireland
27464 — Denmark
13788 — Norway
8431 — Luxembourg
4578 — Lithuania
3315 — Estonia
1729 — Latvia

■ Confirmed Cases

Source: WHO; till 30 September, 2020
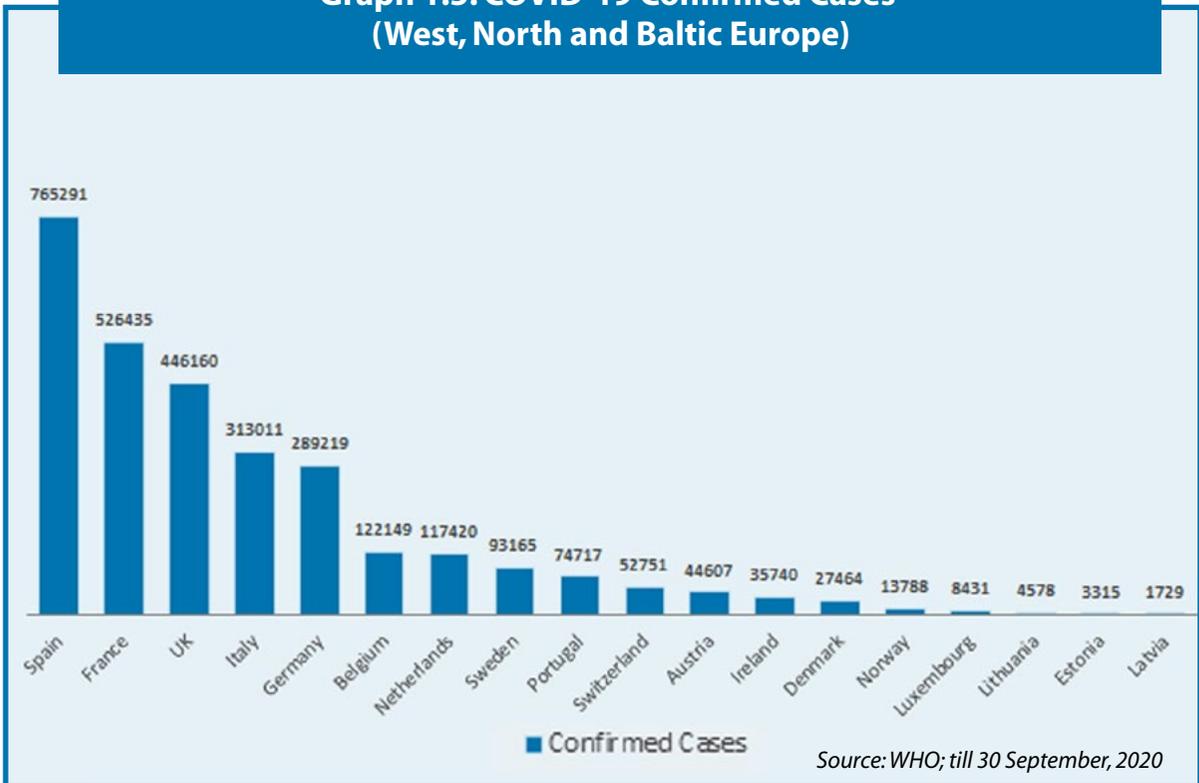
graph in terms of confirmed cases. In fact, Spain has the highest cases among the 18 countries covered in the given graph for the region.

The three sparsely populated Baltic countries - Lithuania, Estonia and Latvia have the lowest number of confirmed cases in the group. In fact, they are among the least affected European countries. However, these countries started witnessing a spike in cases September onwards. This could also be attributed to increased testing. Their low population, ranging between 1 to 3 million, must also be kept in mind while comparing them with other countries.

Sweden, a nation that chose individual responsibility over coerced lockdown when its neighbouring countries were under total shutdown, has confirmed 93,165 cases as of 30 September 2020. This is lower than Belgium, a slightly more populated West

European country. However, Sweden's cases are higher than similarly populated Portugal and neighbouring Denmark, a country that had implemented complete lockdown. The COVID-19 statistics in the early phase were similar for Denmark and Sweden, even as the two Scandinavian countries were implementing absolutely opposing measures against the global pandemic. However, Anders Tegnell, the architect of Swedish strategy had expressed that their model was more sustainable, and that Denmark would struggle the moment starts releasing the lockdown measures. However, as of 30 September, 2020; keeping in mind that Denmark is about half as populated as Sweden, it has confirmed less than one-third the cases confirmed in Sweden.

However, here it must be kept in mind that Sweden has been consistently increasing its testing capacity, reaching 1 million tests per

**Graph 1.6: COVID-19 Confirmed Cases
(Central and East Europe)**

Source: WHO; till 30 September, 2020

■ Confirmed Cases

week, by the last week of August 2020. Since then, the per day case confirmation has also remained consistently high.

In terms of case fatality rate, the top 5 countries - Italy, the U.K., Belgium, Sweden and France have more than 6 per cent case fatality rate each. Italy tops the case fatality rate list in the entire Europe, with an 11.46 per cent case fatality rate.

While Italy was one of the earliest and worst affected countries in the region by COVID-19, it is not facing similar circumstances in the later period, unlike other European counterparts that are experiencing an alarming spike in cases. The most likely explanation is a combination of factors: efficient test and tracing, a longer lockdown, and probably the individual responsibility that came due to the trauma

of the initial attack of the virus on the Italian public health system, thereby frightening Italians into widespread compliance with rules.

2. **Central and East Europe**

Among the 20 countries from Central and East Europe that have been studied, the top 5 are located in East Europe. Russia, in fact, is the country with the most infections in Europe, with 1,176,286 confirmed cases as of 30 September 2020. Russia's confirmed cases are in line with its high population.

However, Belarus, less populated than Czech Republic, Greece and Hungary, has higher cases than these countries. On an average, the case fatality rates in Central and East Europe are lesser, as compared to the more developed West Europe.

Graph 1.7: COVID-19 Confirmed Cases (North Africa)
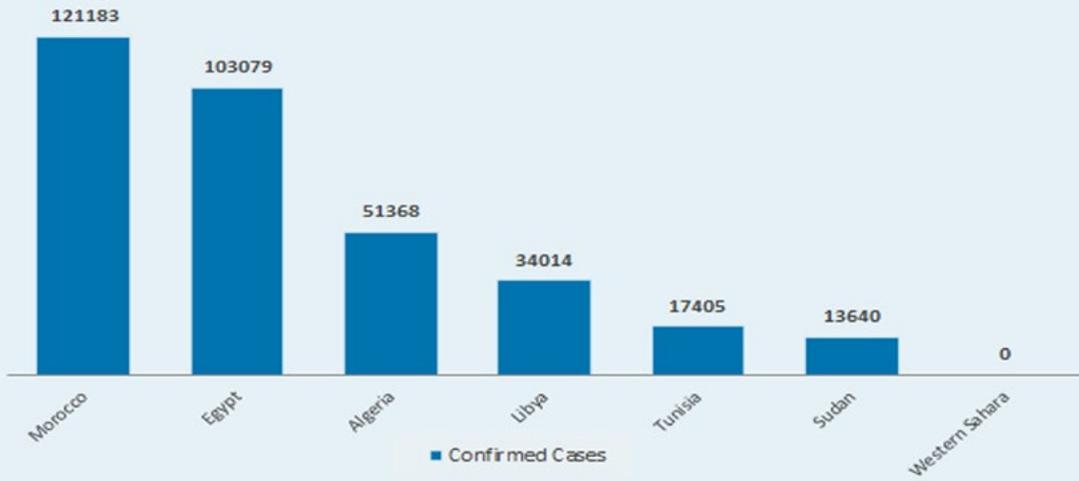
Source: WHO; till 30 September, 2020

III. Africa

The total confirmed cases in 52 Countries of Africa have been analysed by dividing them into 4 geographical zones - North, Central & East, West, and Southern.

1. North Africa

There are 7 countries in North Africa of which data is available for all except Western Sahara.

Despite being less populated that Egypt, Algeria and Sudan, Morocco has confirmed the highest cases, closely followed by Egypt. Morocco was under lockdown since March, and as the Government eased the restrictions June onwards, a daily spike in cases was observed, which catapulted the total cases in the Mediterranean country. However, its case fatality rate at 1.78 per cent is much lower as compared to the other countries in the region. Sudan at 6.53 per cent has the highest case

Graph 1.8: COVID-19 Confirmed Cases (Central and East Africa)
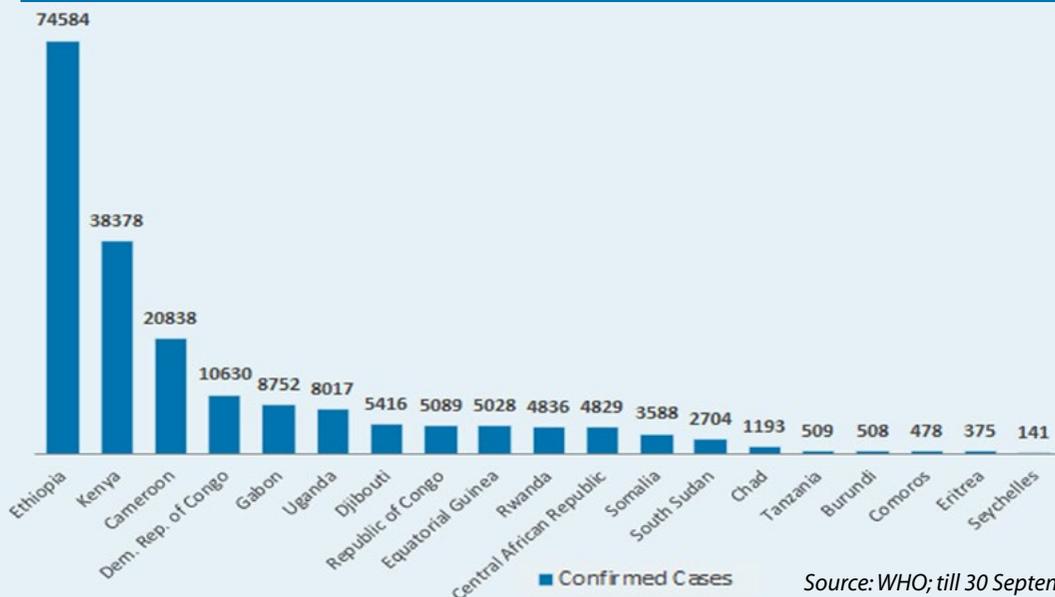
Source: WHO; till 30 September, 2020

Graph 1.9: COVID-19 Confirmed Cases (West Africa)
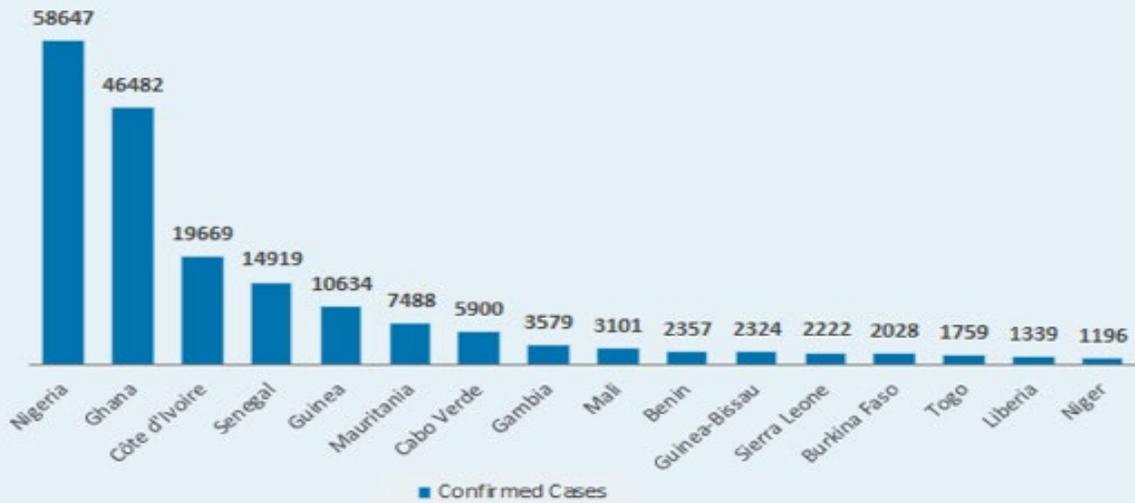
Source: WHO; till 30 September, 2020

fatality rate in northern Africa, followed by Egypt at 5.74 per cent.

2. Central and East Africa

Of the 19 countries studied from this region, Ethiopia has the highest number of cases. It is followed by Kenya, Cameroon and Democratic Republic of Congo. Chad has the highest case fatality rate (7.12 per cent) followed by Tanzania

(4.13%). The island country of Seychelles has zero case fatality rate.

3. West Africa

West Africa seems to be least impacted by COVID-19, with Nigeria having the highest number of confirmed cases (58,647), followed by Ghana (46,482). This, despite the high population of these countries. Liberia and Niger

Graph 1.10: COVID-19 Confirmed Cases (Southern Africa)
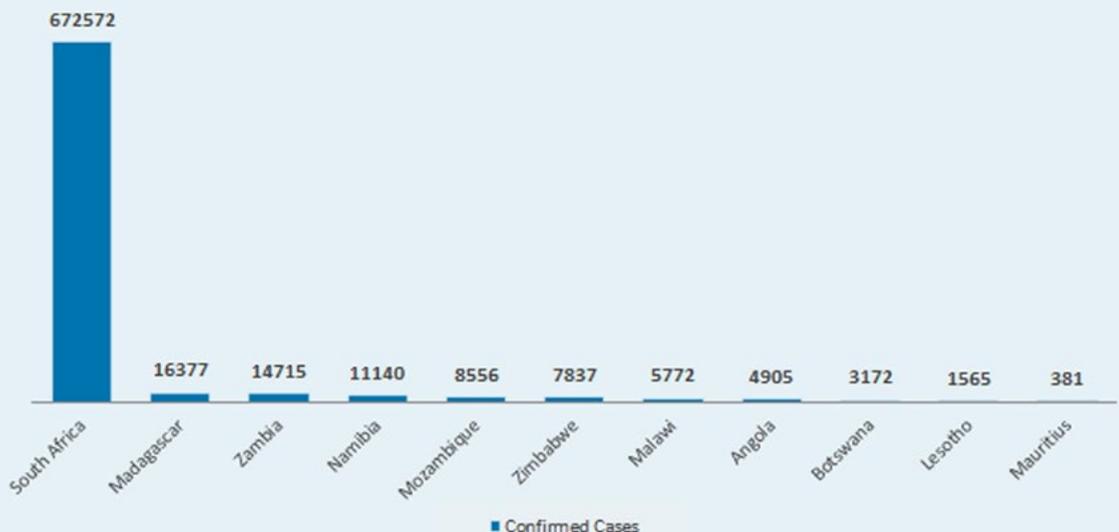
Source: WHO; till 30 September, 2020

have the lowest confirmed cases, but highest case fatality rates at 6.12 and 5.77 per cent respectively.

4. **Southern Africa**

South Africa is the country with the highest number of cases in the African continent. As of 30 September 2020 South Africa had 672,572 confirmed cases and a case fatality rate of 2.48 per cent. Angola has the highest case fatality rate in Southern Africa at 3.65 per cent.

No other country is comparable to South Africa in this region, in terms of number of cases.

While the South African Government believes that the country is well past the surge, it is speculated that the infections are spreading to the rural areas as well. Further, research from the South African Medical Research Council

(SAMRC) documented that the excess deaths in the country have seen a more than 59 per cent increase as compared to the previous years. This indicates that the currently reported case fatality rate of COVID-19 could be misleading, and the actual number of people who have died from the virus could be much higher than reported.

The island country of Madagascar is the second most impacted country in southern region, having more number of cases than other countries such as Angola and Mozambique, which have comparatively higher population.

IV. North America

Of the 14 nations covered from North America, the USA has the highest number of confirmed cases, not just in the continent but the entire world as of 30 September 2020. Mexico has

Graph 1.11: COVID-19 Confirmed Cases (North America)

Source: WHO; till 30 September, 2020
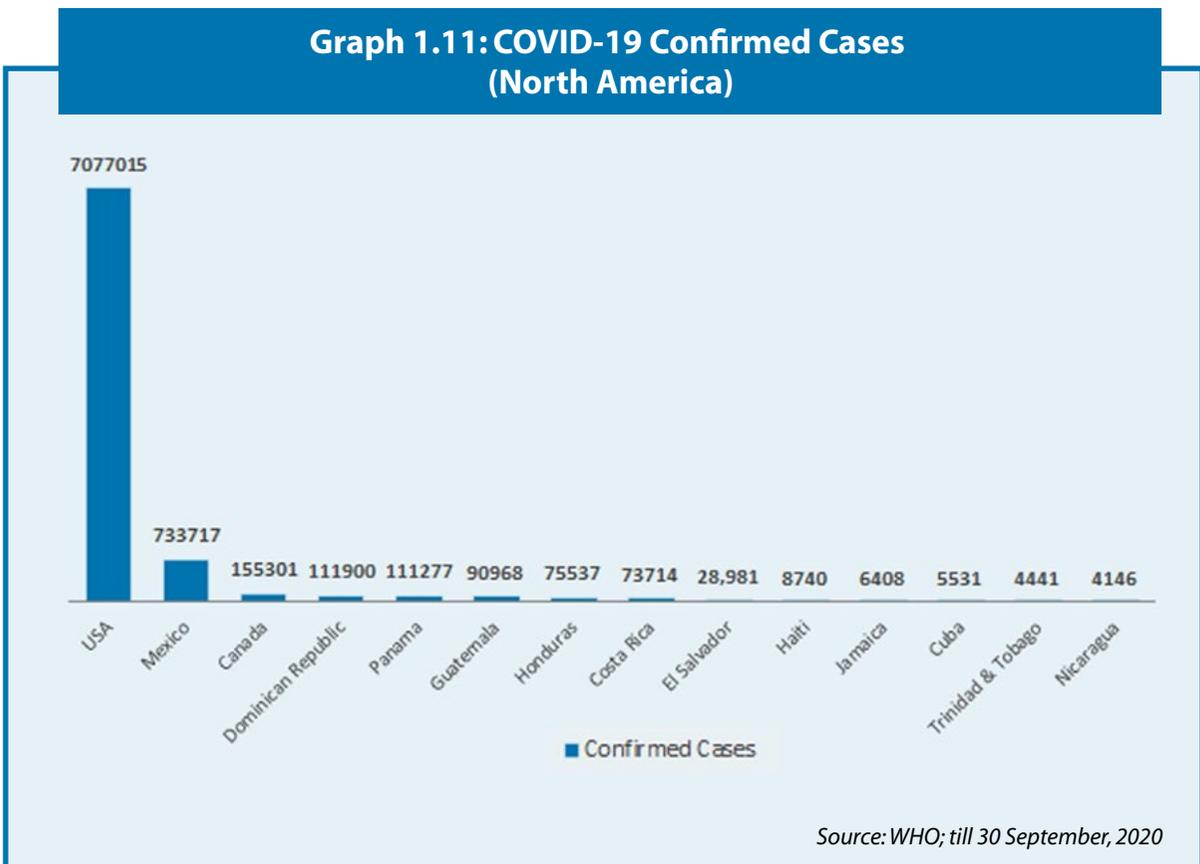
Graph 1.12: COVID-19 Confirmed Cases (South America)

Source: WHO; till 30 September, 2020
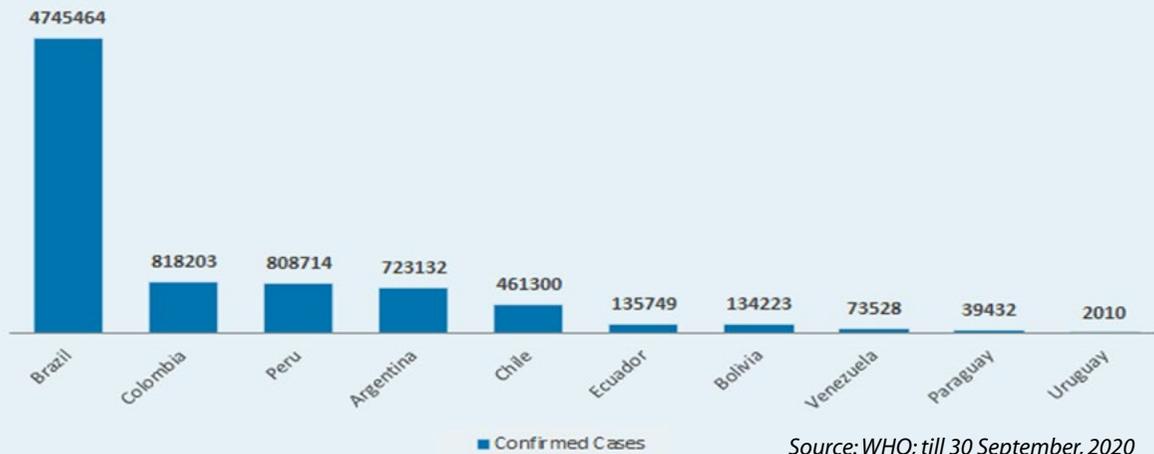
the second highest confirmed cases and the highest case fatality rate (10.44%). While Canada has comparatively much lesser confirmed cases than the USA, its case fatality rate is almost double than America.

Panama and Dominican Republic have population lesser than Cuba and Haiti respectively but the former two countries' cases are more than ten times than the latter two.

V. South America

Of the 10 countries studied in South America, Brazil has the highest confirmed cases in the region, and is among the top 5 infected countries in the world. Colombia and Peru have comparable number of confirmed cases as of 30 September 2020. Argentina has lesser population as compared to Peru, but is having lesser number of confirmed cases. With 8.33 per cent, Ecuador has the highest case fatality rate.

VI. Oceania

The present study covered 4 island nations from the Oceania region, based on the significant number of confirmed cases and their sizeable population. Australia has the highest number of

Graph 1.13: COVID-19 Confirmed Cases (Oceania)

Source: WHO; till 30 September, 2020
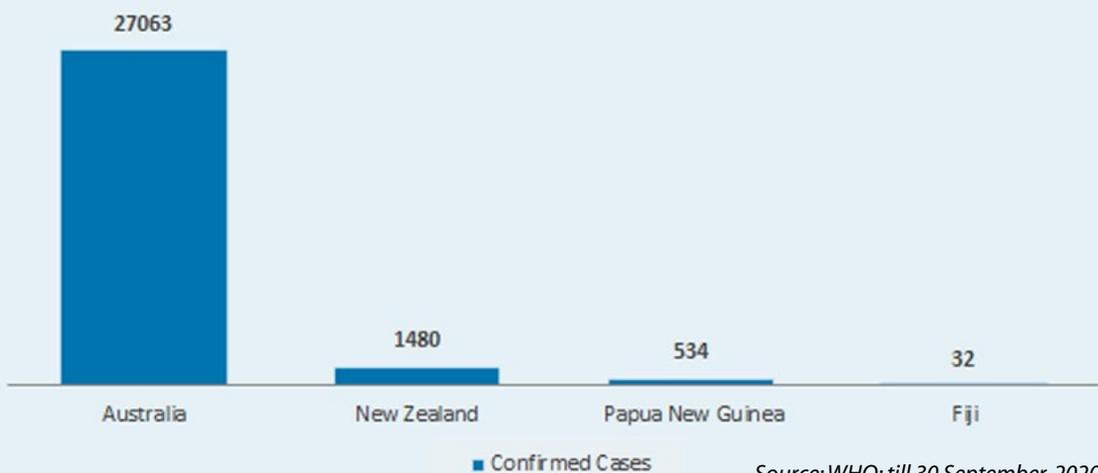
confirmed cases, at 27,063 as of 30 September 2020. Compared to many other nations across the world, the number appears much below average. The case fatality rate of Australia is 3.26 per cent. While Fiji has the highest case fatality rate among the 4 countries, it has just 32 total confirmed cases as of 30 September 2020.

Country wise COVID-19 Case Fatality Rate

Most of the Asian countries have a case fatality rate lower than 3 per cent. The highest case fatality rate in Asia is of Yemen at 28.89 per cent, followed by Iran (5.73 per cent), China (5.21 per cent) and Syria (4.75 per cent). China has the highest case fatality rate in East and South East Asia. Small Asian countries such as Mongolia, Cambodia, Timor Leste, Laos and Bhutan

have registered zero deaths. Larger nations, including India, Japan, Bangladesh, Pakistan and Philippines have less than 2 per cent case fatality rates. Overall, despite the higher population and population density, and comparatively weaker health systems, most of the Asian countries have been able to maintain much lower case fatality rates, as compared to their Europe and America.

Graph 1.14 depicts the twenty countries that have a case fatality rate of more than 5 per cent. War torn Yemen has the highest case fatality rate (28.89 per cent), followed by Italy (11.46 per cent) and Mexico (10.44 per cent). While Yemen confirmed only 2,035 cases as of 30 September 2020, the COVID-19 induced deaths in the country were excessive proportionally. Seven of the top 20 countries are considered to be developed nations. Only

Graph 1.14: Countries with more than 5% COVID-19 Case Fatality Rate
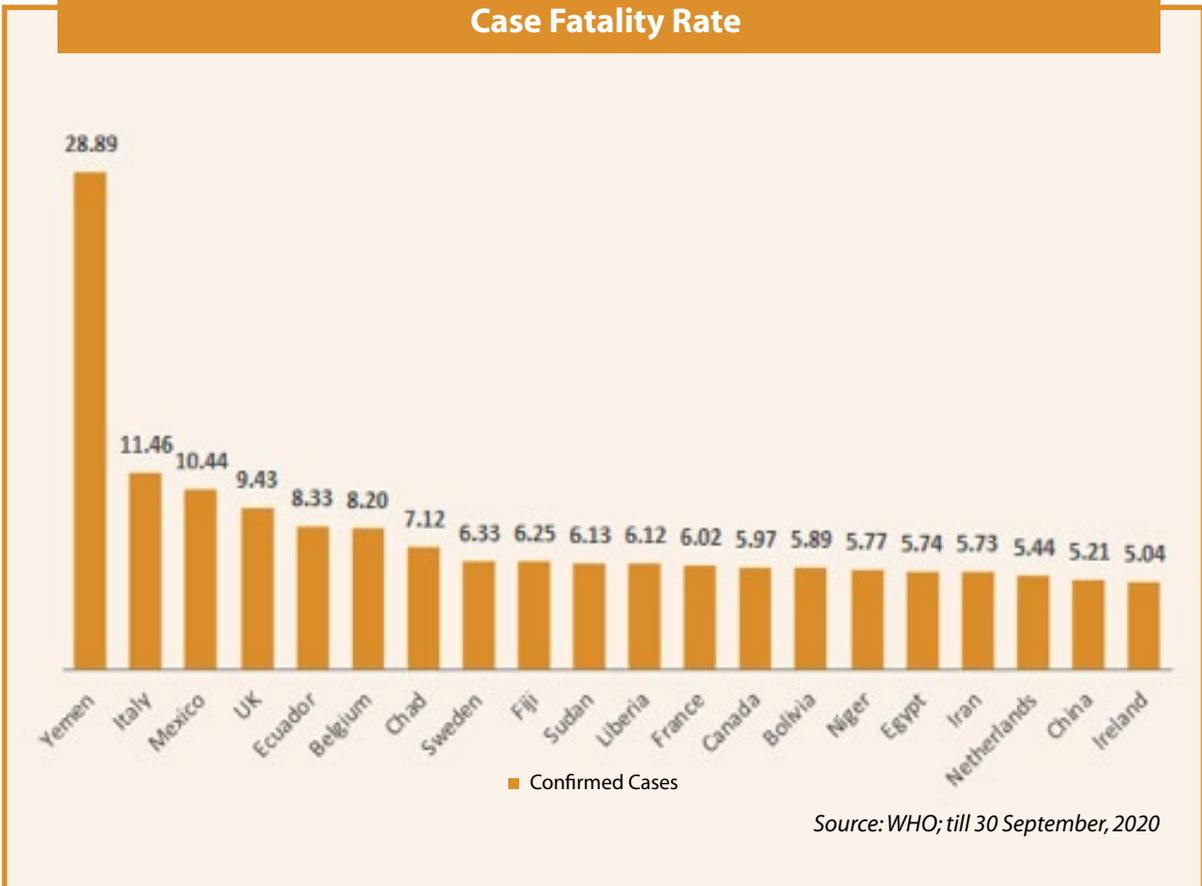
Source: WHO; till 30 September, 2020

Graph 1.15: Countries with 3-5% COVID-19 Case Fatality Rate

Syria 4.75, Mali 4.22, Spain 4.15, North Macedonia 4.14, Tanzania 4.13, Peru 4.00, Bulgaria 3.96, Kosovo 3.96, Romania 3.82, Indonesia 3.75, Afghanistan 3.71, Angola 3.65, Nicaragua 3.64, Guatemala 3.55, Switzerland 3.38, Algeria 3.36, Germany 3.28, Australia 3.26, Sierra Leone 3.24, Vietnam 3.20, Colombia 3.13, The Gambia 3.13, Malawi 3.10, Bosnia-Herzegovina 3.07, Honduras 3.05

■ Confirmed Cases

Source: WHO; till 30 September, 2020

China and Iran are among the worst case fatality rates from Asia.

Graph 1.15 depicts 25 countries that have case fatality rate between 3 to 5 per cent. 9 of the countries are from Europe in this list. Graph 1.16 depicts the 16 countries which have a case fatality rate of less than 0.5 per cent. The seven countries that have observed zero case fatality rates are small in population size, and the total confirmed COVID-19 cases.

Singapore, as discussed earlier, has extremely high number of confirmed cases, as compared to its neighbours, but has an impressively low case fatality rate. The UAE also has maintained a low case fatality rate, despite the high confirmed cases.

18 countries have 0.5-1 per cent case fatality rate and 82 countries have 1-3 per cent case fatality rate. Most of the Asian countries fall in the latter bracket.

Graph 1.16: Countries with less than 0.5% COVID-19 Case Fatality Rate

Botswana 0.50, Slovakia 0.47, UAE 0.45, Sri Lanka 0.39, Bahrain 0.35, Maldives 0.33, Burundi 0.20, Qatar 0.17, Singapore 0.05, Mongolia 0.00, Cambodia 0.00, Timor Leste 0.00, Laos 0.00, Bhutan 0.00, Eritrea 0.00, Seychelles 0.00

■ Confirmed Cases

Source: WHO; till 30 September, 2020

Spread of COVID-19 and Public Healthcare System

As per the U.S. News & World Report 2020 Best Countries report (formed in partnership between U.S. News & World Report, BAV Group and the Wharton School of the University of Pennsylvania), the following 10 countries are considered to be having the best public healthcare system:

1. Canada
2. Denmark
3. Sweden
4. Norway
5. Germany
6. United Kingdom
7. Japan
8. Australia
9. The Netherlands
10. Switzerland

Further, depending on the criteria, various countries can be considered as having some of the best health care systems. For instance, in terms of choice of doctor and hospitals, Germany, Switzerland and France are considered to be the best. In terms of no-deductions at the time of care, Britain, Canada and the public hospitals of Australia are considered. In terms of low drug prices, Norway and Australia are considered to be the best.

The graph below visualises the spread of COVID-19 in these top ten countries: The U.K. has been the most affected among these 10 countries, with the highest number of confirmed cases as well as deaths. It is followed by Germany and Canada. Canada however, has a higher case fatality rate as compared to Germany.

Graph 1.17: COVID-19 Impact in Top 10 Public Healthcare System Countries

Source: WHO; till 30 September, 2020
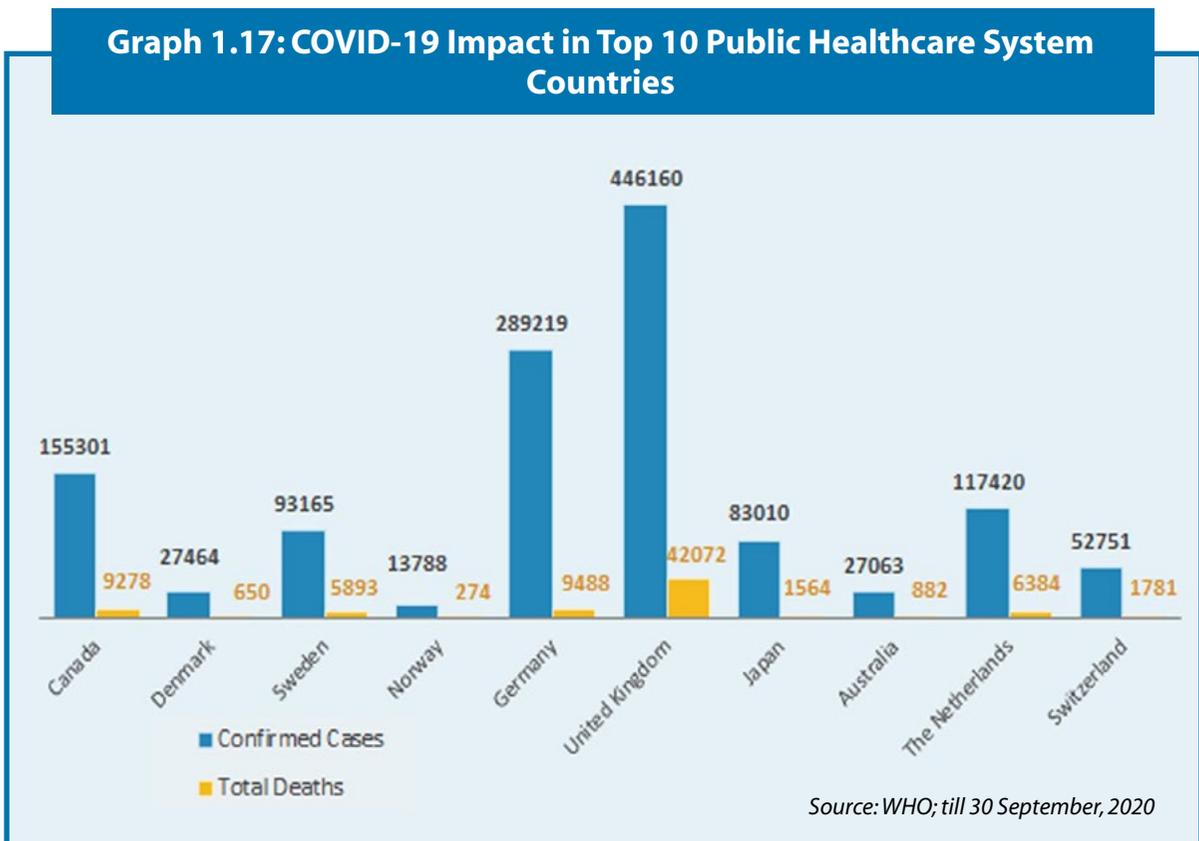
S.No.	Country	Population	Total cases	Total Deaths	Case Fatality Rate
	TABLE 1.2: Impact of COVID-19 on Top Ten Public Healthcare System				
1	**Canada**	37,411,047	155301	9278	5.97
2	**Denmark**	5,771,86	27464	650	2.37
3	**Sweden**	10,036,379	93165	5893	6.33
4	**Norway**	5,378,857	13788	274	1.99
5	**Germany**	83,517,045	289219	9488	3.28
6	**United Kingdom**	67,530,172	446160	42072	9.43
7	**Australia**	25,203,198	27063	882	3.26
8	**Japan**	126,860,301	83010	1564	1.88
9	**The Netherlands**	17,097,130	117420	6384	5.44
10	**Switzerland**	8,591,365	52751	1781	3.38

Source: WHO, till 30th September 2020

The U.K has the highest case fatality rate (9.43 per cent), followed by Sweden (6.33 per cent), Canada (5.97 per cent) and Netherlands (5.44 per cent).

Among these, Norway appears to be having the lowest number of confirmed cases while Japan has the lowest case fatality rate. However, Norway's population is much lower as compared to the other countries, ensuring that the public health systems are not as burdened..

COVID-19 Deaths and Age-wise Distribution

On analysing the latest official updates available for 15 countries from across the world, a general trend has emerged. The majority of COVID-19 deaths in all these countries have been occurring in the senior citizens age group. Apart from India (51.42%), Ukraine (74.88%) and Argentina (82.75%), more than 90 per cent of COVID-19 deaths in the rest of the countries have hit the 60 above population.

			60 years and above		0-59 years	
S. No.	Country	Date of age-wise data	Total deaths	Total deaths in this age group	Percentage of deceased in this age group	Total deaths in this age group	Percentage of deceased in this age group
1	**South Korea**	28 September[4]	406	381	93.84%	25	6.16%
2	**Japan**	30 September[5]	1536	1453	94.6%	76	4.95%
3	**Sweden**	29 September[6]	5890	5648	95.89%	242	4.1%
4	**Germany**	29 September[7]	9,456	8987	95.04%	469	4.95%
5	**Italy**	22 September[8]	35,727[15]	34,076	95.37%	1,650	4.62%
6	**Portugal**	17 August[9]	1778	1694	95.28%	84	4.72%
7	**Denmark**	29 September[10]	650	632	97.23%	18	2.77%
8	**Ukraine**	27 September[11]	3957	2963	74.88%	994	25.12%
9	**Spain**	10 May-30 September[12]	3629	3313	91.29%	316	8.71%
10	**Netherlands**	6 October[13]	6,482	6275	96.8%	207	3.2%
11	**France**	24 September[14]	21,023[15]	19,519	92.84%	1,381	6.57%
12	**U.S.A.**	19 September[16]	188,470[15]	172,725	91.65%	15,741	8.35%
13	**India**	22 August[17]	56,288	28,942	51.42%	27,346	48.58%
14	**Australia**	14 October[18]	897	877	97.77%	20	2.23%
15	**Argentina**	13 October[19]	24,364	20,160	82.75%	4,204	17.25%

TABLE 1.3: Country-wise COVID-19 Data by Age

Source: WHO, till 30th September 2020

India is a peculiar case among all these countries as its younger population is appearing to be as prone to the virus induced death, as its senior population. 48.58 per cent of India's COVID-19 deaths are among under 60 population. Of these, 52 per cent cases are in the 51-60 age group, and almost 80 per cent cases have been observed in the 41- 60 years age group.

Ukraine too has observed one-fourth of its total COVID-19 deaths in the under 60 age group. Of these, more than 65 per cent deaths occurred in the age group of 50-59 years, and more than 88 per cent deaths were observed in the age group of 40-59 years.

The higher deaths among younger population can be correlated with the weaker public health care system, younger demography

of the country, and higher co-morbidities observed in the age groups above 40 years in India.

Unlike in Europe, India also observed relatively fewer deaths among people over 80. This can be attributed to the lower life expectancy in India (69.1 years), compared to 83.2 years in Italy, 80.9 years in Germany, and 78.4 years in the U.S.

COVID-19 and Sex-based Distribution

Table 1.4 elucidates the sex wise data of COVID-19 deaths in 12 countries from around the world, for which data was available. It must be noted here that while earlier India, the USA and Japan were not releasing sex-wise data, it is now available for India and the USA. Earlier, India was partially releasing some sex-based data during some of the daily press briefings.

				Male		Female	
S. No.	Country	Date of age-wise data	Total deaths	Total deaths in this group	Percentage of deceased in this group	Total deaths in this group	Percentage of deceased in this group
1	**South Korea**	28 September[4]	406	216	53.2%	190	46.8%
2	**Sweden**	29 September[6]	5890	3,222	54.7%	2,668	45.3%
3	**Germany**	29 September[20]	9,456	5,244	55.45%	4,212	44.54%
4	**Italy**	22 September[8]	35,727	20,491	57.36%	15,236	42.64%
5	**Portugal**	17 August[9]	1778	895	50.33%	883	49.66%
6	**Ukraine**	27 September[11]	3957	2137	54.0%	1820	45.99%
7	**Denmark**	29 September[10]	650	367	56.46%	283	43.54%
8	**Netherlands**	29 September[21]	6,371	3,498	54.9%	2,873	45.1%
9	**France**	24 September[14]	21,023[15]	12,262	58.33%	8,595	40.88%
10	**U.S.A.**	19 September[16]	188,470[15]	101,819	54.02%	86,647	45.97%
11	**India**	22 August[17]	56,288	38,973	69.24%	17,315	30.76%
12	**Australia**	14 October[18]	897	432	48.16%	465	51.84%

Source: WHO, till 30th September 2020

Except for Australia, all the other 11 countries have observed a higher case fatality among males, as compared to females. While the latest data on sex-wise confirmed cases were not available for all these countries, the earlier sex-based data (April-May 2020) available for countries including Germany, Sweden, South Korea, Denmark, Spain and Italy showed that despite the fact that more females were infected as compared to males, fatality rates were higher among males.

India has shown more skewed data as compared to other countries, as almost 70 per cent of the COVID-19 deaths have been among males.

Conclusion

The present study has been conducted to arrive at a global picture of the pandemic situation, after almost three quarters of its discovery in China. While the data has been changing quite rapidly, and the countries covered in the current analysis could end up looking much different a few months from now, a global mapping of the situation can assist us in arriving at a mid term assessment of the impact of the pandemic on various geo-political regions, age groups and sex.

It appears that the elderly male population across the countries under study have been more susceptible to COVID-19 fatality. It must be kept in mind that the study is based on the official cumulative data provided by these countries. Factors like lack of aggressive testing, buckling public health systems, late isolation of hotspots within the countries, co-morbidities; also

contribute heavily to the data. Lower cases in some countries could also be attributed to less aggressive testing.

Moderate case fatality rates in Germany could be a result of higher testing. The Scandinavian countries, while initially displayed moderate results in terms of sheer numbers despite following differing strategies, the numbers are spiking in Sweden as their testing became more aggressive.

The analysis of the cases and case fatality rates in the top notch public health system based countries has shown that the pressure of the pandemic can shake even the strongest systems, especially due to a weak strategy, as observed in the UK.

The impact of COVID-19 in terms of sheer numbers has been more heavily felt by West Europe as compared to the rest of the continent. Even though East Europe is not as developed and rich as its western counterpart, the region has reported lower number of cases. It could again, be an output of either less aggressive testing, or strict restrictions on movement.

Lower number of cases are being confirmed in many African countries. However, the continent also has some of the highest case fatality rates. Aggressive testing, especially in the rural outskirts of the urban hubs must be promoted. Further, apart from viewing data cumulatively, newer waves of regional infections can also be driving higher cases and deaths.

The Middle East has observed a moderate number of total confirmed cases in most of

the countries. However, case fatality rates in the tension filled areas of Yemen and Syria must not be ignored, even if the total cases are not as high as their neighbours.

Most of the Asian countries (apart from West Asia), despite their high population and population densities have managed to maintain moderate, to low case fatality rates. The 0.05 case fatality rate of Singapore, despite having 57,742 confirmed cases as of 30 September 2020 is worth mentioning here.

While South America was not in the grave picture in the first quarter, as of end of September 2020, three of the Latin American countries are among the top 6 countries with most number of confirmed cases.

Perhaps, Oceania has been the least impacted by the pandemic with seemingly moderate to less cases in the 4 countries under study.

A report by United Nation World Tourism Organisation (UNWTO) found that as of 1 September 2020 while 81 per cent destinations in Europe had eased the travel restrictions, the same was true for only 28 per cent of Asia-Pacific destinations. Further, Asia-Pacific region's response was also shaped by the 2003 SARS outbreak. On the other hand, the European and American response struggled to balance the relevant guidelines and best practices with individual freedom.

Overall, the pandemic has perhaps hit most of the developed nations with higher number of positive cases. Increased testing, data transparency, and availability of better health care facilities in the developed regions could be the major reasons behind the higher number of infections detected in these countries.

Photo credit-Q107toronto

Photocredit-© AFP via Getty Images

Strategies for Prevention and Control of COVID-19

The world has been fighting to contain the COVID-19 outbreak. Countries have been implementing various strategies around the world, which largely involve preventive measures to control the outbreak. The key strategy has been early protection, early identification, early diagnosis, and early isolation to effectively curb the rapidly growing outbreak.

Across the world, regimes followed various containment models. While many countries including India and the USA chose complete lockdown of their socio-economic institutions to protect their citizens from the pandemic, it came with a heavy price; a severe economic and social stalemate. On the other hand, there are countries that implemented partial lockdowns. For example, Japan implemented selective lockdown for the elderly and people with co-morbid conditions (like high blood pressure, cardiac issues and diabetes). At the other extremity of the spectrum are countries.

A) Complete Lockdown Strategy

While it was too early to credit any strategy as the most effective and sustainable against the novel coronavirus, the majority of countries globally chose to bring their socio-economic activities to a halt to isolate their residents, in order to prevent the rapid and uncontrolled spread of COVID-19. While "lockdown" isn't a technical term used by public-health officials, it can refer to anything from mandatory geographic quarantines to non-mandatory recommendations to stay at home, closures of certain types of businesses, or bans on events and gatherings.

In order to effectively prevent large scale transmission of cases to other regions, a majority of countries starting with China implemented lockdown. Other measures such as security checks with body temperature assessment, became mandatory for the entry to communities and various public facilities.

Origin of Lockdown in Hubei Province, China

By 22 January 2020, the novel coronavirus had spread to major cities and provinces in China, with 571 confirmed cases and 17 deaths reported. Cases were also confirmed in other regions and countries, including Hong Kong, Macau, Taiwan, Thailand, Japan, South Korea, and the United States. According to Li Lanjuan, a professor at Zhejiang University's school of medicine and member of the high-level expert team, convened by the National Health Commission, she had urged a lockdown on Wuhan on several occasions between 19 and 22 January 2020, as a last resort to contain the epidemic.

At 2 a.m. on 23 January 2020, Wuhan City issued the Circular No. 1 of the Epidemic Prevention and Control Headquarters, informing residents of Wuhan that in order to effectively cut off the virus transmission path and curb the spread of the epidemic, from 10:00 a.m. on January 23 2020; Wuhan city buses, subways, ferries, and long-distance passenger transportation would be suspended. For no special reason, citizens should not leave Wuhan and the airport and railway station leaving Han passage were temporarily closed. The recovery time was to be announced separately. The circular caused chaos in Wuhan, as an estimated 300,000 people were reported to have left Wuhan by train alone, before the 10 a.m. lockdown.

By the afternoon of 23 January 2020, the authorities began shutting down some of the major highways leaving Wuhan. The lockdown came two days before the Chinese New Year, the most important festival in the country, and traditionally the peak traveling season. Following the lockdown of Wuhan, public transportation systems in two of Wuhan's neighbouring cities, Huanggang and Ezhou, were also placed on lockdown. In fact, by 24 January 2020, 12 other cities in Hubei were placed on traveling restrictions, bringing the number of people affected by the restriction to more than 50 million.

Organisations Involved in Decision Making in China During Lockdown

A number of organisations active at various levels of governance structure, have been actively involved in the decision making process in China, since the detection of the first cases of novel coronavirus. At city level, Wuhan Center for Disease Control and Prevention detected cases of "pneumonia of unknown cause" towards late December. Wuhan Municipal Health Commission on 30 December 2019 issued an urgent notification to medical institutions under its jurisdiction, ordering efforts to appropriately treat patients with pneumonia of unknown cause. On 31 December 2019, the municipal commission released a briefing on its website about the pneumonia outbreak in the city, confirming 27 cases and telling the public not to go to enclosed public places, or gather.

At provincial level, Hubei Province New Coronavirus Infection Pneumonia Prevention and Control Headquarters was established on 20 January 2020 at Wuhan, capital of Hubei Province for the control and treatment of the pneumonia, caused by the novel coronavirus. The headquarters, headed by the mayor Zhou Xianwang, consist of eight groups including those in charge of emergency response supply, traffic, medical treatment and epidemic control.

There are two national level institutions responsible for the management, implementation and evaluation of the response: National Health Commission (NHC) and the China Centres for Disease Control and Prevention (China CDC). NHC came up with a set of guidelines on early discovery, early diagnosis, and early quarantine for the prevention and control of the viral pneumonia of unknown cause.

Upon the detection of a cluster of pneumonia cases of unknown etiology in Wuhan, the Communist Party of China (CPC) Central Committee and the State Council launched the national emergency response. A Central Leadership Group for Epidemic Response and the Joint Prevention and Control Mechanism of the State Council were established.

Details and Impact of Lockdown Strategy in China

When China pioneered the sudden shutdown strategy against the epidemic in January 2020, it was considered an aggressive stance with considerable skepticism about its sustainability. This was largely based on the scale and strictness of the lockdown, with millions of people in the affected provinces.

To give an extent of the lockdown measures in Wuhan, transport into and out of the city was shut without exceptions, even for medical emergencies. All shops were closed except those selling food or medicine. Private vehicles were banned without special permission and most public transport was stopped. Schools and universities were already on vacations which were extended indefinitely. Silence and emptiness prevailed. Movement of people from their homes was further restricted as the lockdown ensued. As the policy turned more aggressive, officials started visiting door to door for health checks, and if anyone was found to be ill they were coerced into isolation. Soon after Wuhan was locked down, strict measures were put to place in other parts of the country. Footage from Inner Mongolia,

more than 1,000km from Wuhan was shared by state-owned Global Times which showed authorities using drones to track and scold the residents traveling outside without masks.

The result of this aggressive strategy were reflected as early as March 2020, when China officially reported the first day without any domestic transmission of COVID-19. Lockdown was lifted from Wuhan on 8 April 2020, after 76 days. As of 28 September 2020, the country of origin of the pandemic has officially reported 90,993 confirmed cases of COVID-19 with just 4,746 deaths, much lower as compared to other major countries across the world. However, the country did face a second wave of COVID-19 in certain regions.

China's Strategy Against COVID-19's Second Wave

By 2 March 2020, the total COVID-19 cases had crossed 80,000 in China. Since then, the country witnessed a flattening of the curve based on the officially reported data, such that there were less than 50 daily cases in May and June. However, China again saw a spike in daily cases post June 2020 in certain regions, which reflected in increase in the COVID-19 cumulative data of the country.

June 2020 Resurgence in Beijing

By early June 2020, with fewer active cases across the country, Beijing had relaxed many of its restrictions, to an extent that locals were no longer mandated to wear masks outdoors. In such a scenario, a new patient emerged in the city on 11 June 2020 through which subsequently, 335 cases were traced, most of which belonged to the Xinfadi wholesale market in southern Beijing. The market, as a result, was rapidly closed.

Thousands of people were placed under quarantine, followed by the testing of 11 million people for the virus. The city banned outbound travel of residents living in at-risk areas and required others to show negative COVID-19 test results in order to leave.

While the authorities are still investigating the cause of the outbreak, early tests found traces of the virus on a cutting board at Xinfadi market that was used to process imported salmon.

July 2020 Outbreak in Xinjiang

On 28 July 2020, China's National Health Commission announced 64 locally transmitted COVID-19 cases, of which 57 were found in Urumqi, Xinjiang's capital. The region is home to Uighur and other Turkic Muslims, treatment of whom has drawn much international condemnation and genocide accusations against the Chinese authorities. Officials dispatched thousands of police officers to impose a lockdown in Urumqi and other cities, including Kashgar, announcing a "wartime" campaign. Medical experts eventually diagnosed more than 800 cases of the coronavirus.

In the coming weeks, the Chinese Government imposed a sweeping lockdown, and expanded testing across the Xinjiang region to control the fresh outbreak. The lockdown, which according to government notices, has affected at least four million people and has revived concerns about human rights abuses in Xinjiang.

Chinese officials have not provided detailed information about the restrictions, their scope or rationale. As per the official notices, at least three cities in the region have been affected, but the lockdown is likely to be more extensive. Throughout August, residents in at

least 9 jurisdictions, covering a population of more than 10 million, used Weibo and other social media sites to post about being under lockdown.

However, local officials have tried to portray themselves as responsive and transparent. In fact, in an unusual gesture, the state-run news media published cellphone numbers of government and party officials in Urumqi, encouraging needy residents to call them and saying they stood ready to "effectively solve the difficult demands of the people of all ethnic groups."

Further, academicians observed that the measures in Xinjiang were consistent with the Chinese government's strategy of restricting outbreaks "at all costs." Human rights, choice and dignity often take a backseat while achieving the paramount task of eliminating the virus from a region. It was similar to the strategy implemented while controlling the outbreak in Wuhan in January, where the Government imposed a similar lockdown that lasted 76 days.

The extreme strategies by the authorities seem to work, as the number of locally transmitted cases in China dropped to four on 15 August 2020, all of which were in Xinjiang. On 1 September 2020, after reporting zero new symptomatic cases for 17 consecutive days, the authorities announced the gradual lifting of the stringent lockdown measures from the region to "resume ordinary life and economic production".

Evolution of China's Strategy

Unlike most countries that have been strategising to only slow COVID-19's spread,

China has been aiming to eliminate the virus within its borders. Initially China had imposed a strict lockdown in Hubei Province after the first viral outbreak in January 2020, confining nearly 60 million people to their homes. Since late March 2020 when China first reported zero locally transmitted cases, new infections have been met with sweeping lockdowns and contact tracing and testing. But multiple small clusters of cases continue to appear.

In the June 2020 outbreak, Beijing used what city authorities called "precise control" to lock down residential areas one neighbourhood at a time. All food and beverage workers across the city were required to take virus tests, and some bars were ordered to shut. However, most malls and restaurants in parts of the city where no cases had been detected were allowed to remain open. The city focused on tracing and rapidly isolating everyone who had potentially been exposed to the virus. Volunteers went door to door across the city, asking residents if they had been in contact with people who may have been exposed to the virus.

However, Beijing is unlikely to serve as a model for other countries to deal with similar second-wave outbreaks. For instance, Chinese authorities used security camera footage of the personal car licence plates, to determine whether they had been near the market. If affirmative, such residents were ordered to take virus tests. Such kind of actions are not easily implementable in other countries.

Similarly, the treatment of residents in the Xinjiang region can hardly be considered replicable for any other country, considering the reports of human rights violations associated with the strategy.

WORLD **COVID LOCKDOWN** | Date of **Lockdown Implementation** (2020)

Norway — 12 March

Denmark — 13 March

Britain — 20-23 March

Czech Republic — 16 March

Belgium — 13 March

Poland — 13 March

Republic of Ireland — 27 March

Italy — 9 March

Kuwait — 13 March

India — 24 March

Argentina — 21 March

France — 16 March

Thailand — 3 April

Spain — 14 March

Greece — 13-16 March

Saudi Arabia — 25 March- 6 April

Malaysia — 16 March

South Africa — 26 March

New Zealand — 25 March

Global Spread of Lockdown Strategy

On 30 January 2020, Dr. Tedros Adhanom Ghebreyesus, Director-General of the World Health Organization (WHO), following the advice of the Emergency Committee convened under the International Health Regulations (2005), declared the outbreak of COVID-19 a public health emergency of international concern and issued Temporary Recommendations. Post this, throughout February, countries started implementing travel restrictions to and from affected countries, and contact tracing of positive cases all over the world.

However, when cases started surging, doubling rate increased and mortality rate started growing; European countries started applying lockdown to implement mass quarantine. Another month and a half went by

before the WHO called COVID-19 a pandemic on 11 March 2020. It urged the countries to "continue efforts that have been effective in limiting the number of cases and slowing the spread of the virus."

Dr Hans Henri P. Kluge, WHO Regional Director for Europe similarly urged the countries to "continue to implement a containment strategy while accelerating their efforts to control the disease. Swift action is essential and each day can make a difference."

By this point, the virus had killed more than 4,000 people, and had infected 118,000 people across nearly every continent. This is probably when "lockdown" seemed the most effective tool to slow down the spread of COVID-19 and most of the countries chose to go ahead with it, rather than risking the lives of their citizens by experimenting other measures, while continuing socio-economic

Great Barrington Declaration

The Great Barrington Declaration was drafted at the American Institute for Economic Research in Great Barrington, Massachusetts and signed there on 4 October, 2020. Since then, it has been signed by more than 6,000 scientists and medical experts across the globe, as well as 50,000 members of the public. It advocates an alternative, risk-based approach to the COVID-19 pandemic that involves "Focused Protection" of those most at risk, and seeks to avoid or minimise the societal harm of lockdowns.

The movement believes that keeping the lockdown policies in place until a vaccine is available would cause "irreparable damage, with the underprivileged disproportionately harmed". The health harms cited include lower childhood vaccination rates and worsening care for heart disease and cancer patients.

Further, they claim that the risk from coronavirus is 1,000 times greater for the old and infirm, with children more at risk from flu than COVID-19. In this regard, as immunity builds in the population, the risk of infection to all, including the vulnerable falls. This would be a much more "compassionate" approach.

The declaration appeals that those who are not vulnerable should be allowed to resume life as normal – back to in-person teaching in schools, young people back at workplaces rather than working from home, the opening of restaurants and other businesses, and the resumption of sports, music, and cultural activities.

The declaration recommends a number of measures to protect the vulnerable, including regular testing of care-home workers, with a move as far as possible towards using staff who have acquired immunity. Retired people living at home should have groceries and other essentials delivered, and should meet family members outside rather than inside, when possible. Simple hygiene measures, such as hand washing and staying home when sick, should be practised by everyone.

The movement is being perceived as well intentioned, however, some experts have found ethical, logistical and scientific flaws in the declaration, especially with respect to herd immunity. The major arguments against it being the lack of evidence of a reinfectionproof herd immunity against COVID-19, and the lives of frontline workers being put at risk.

Second Wave Infections in Europe

As of October 2020, Europe had over 200,000 active COVID-19 cases, a dramatic high since July 2020 when the cases were under 15,000. This prompted major countries to implement fresh restrictions and even regional lockdowns to contain the spread. The rise in cases in Europe did not spare even Germany, which had a successful track record in containing the spread. On 25 October 2020, Spain declared a state of Emergency to impose curfews to fight the virus, after it became the first European country to record more than a million cases of the virus.

One reason behind the surging cases across Europe could be the general increase in the testing levels across all countries. This resulted in the identification of even asymptomatic and mildly symptomatic cases. However, this increase in testing does not explain the full epidemiological picture in these countries.

For instance, in many countries, the increase in test positivity is accompanied by an increase in hospital and ICU admissions, signalling more serious cases.

Experts have pointed at complacency especially after cases reduced post June 2020. Resistance at an individual level to wear masks must be noted while observing the second wave of COVID-19 pandemic in Europe.

activities. Italy and Denmark were some of the first countries in the continent to implement lockdown.

Following China; India, France, Italy, New Zealand, Poland, and the UK implemented the world's largest and most restrictive mass quarantines.

Some smaller European countries, such as Greece, Portugal, Czech Republic and Austria, appear to have dealt with their outbreaks more effectively by keeping the number of cases relatively low. What these countries did differently was to start the lockdown earlier than others, adopting measures more quickly than the other European countries, thus limiting the speed of the contagion.

Unlike in France, Spain, Italy and Germany, the numbers of new daily cases are now declining rapidly. Italy, France and Spain progressively enforced the lockdown measures as the infection curve got steeper.

Around the time of the third confirmed COVID-19 death in each country, doubling time was typically between one and six days. Two weeks later, the Czech Republic and Austria had already managed to slow down the spread of the virus and increase that time span to more than 10 days. At the same point, confirmed cases in France and the U.K. were still doubling every three to four days.

However, the lockdown is only buying the countries time, to really defeat the virus, data driven and targeted approach involving mass testing as seen in South Korea is required.

B) Partial Lockdowns

Germany and Japan implemented limited lockdown which played a role in containment along with other mechanisms.

1. German Containment Model

The COVID-19 pandemic was confirmed to have reached Germany on 27 January 2020, when the first COVID-19 case was confirmed and contained near Munich, Bavaria. The majority of the cases in January and early February in 2020 originated from the headquarters of a car parts manufacturer there. On 25 and 26 February 2020, multiple cases related to the Italian outbreak were detected in Baden-Württemberg. A large cluster linked to a Carnival event was formed in Heinsberg, North Rhine-Westphalia, with the first death reported on 9 March 2020. New clusters were introduced in other regions via Heinsberg, as well as via people coming from Italy, Iran and China, from where non-Germans could arrive by plane until 17-18 March 2020.

German disease and epidemic control is advised by the Robert Koch Institute (RKI) according to a national pandemic plan. Germany has a common National Pandemic Plan, which describes the responsibilities and measures of the health care system actors in case of a huge epidemic. In early March 2020, the national plan was extended for the handling of the ongoing coronavirus pandemic.

Four major targets are included in this plan:
a)   Reduce morbidity and mortality.

b)   Ensure treatment of infected persons.
c)   Upkeep of essential public services.
d)   Short and accurate information fordecision-makers, media and public.

The plan has **three stages** which might eventually overlap:

Containment	Protection	Mitigation
circumstances of dedicated cases and clusters	circumstances of further spreading infections and unknown sources of infections	circumstances of widespread infections
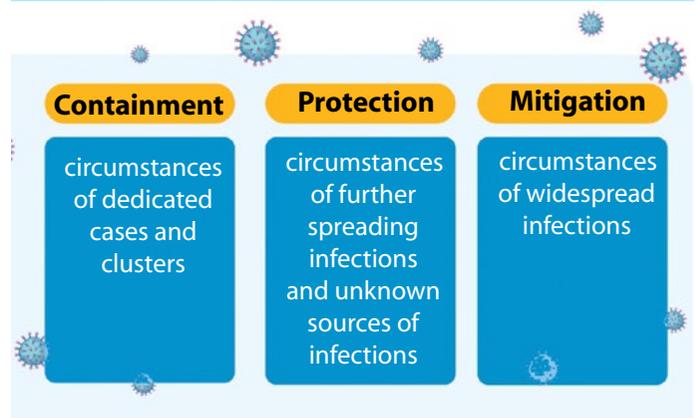
The outbreaks were first managed in a containment stage, which attempted to minimise the expansion of clusters. The German government and several health officials stated that the country was well prepared, and at first saw no need to take special measures to stock up or limit public freedom.

Since 13 March 2020, the pandemic has been managed in the protection stage as per the RKI plan, with German states mandating school and kindergarten closures, postponing academic semesters and prohibiting visits to nursing homes to protect the elderly. Two days later, borders to five neighbouring countries were closed. On 22 March 2020, the

German Government announced a national curfew authorising individuals to leave their living quarters for certain activities; e.g. commuting to work, engaging in sports, or purchasing groceries but not in groups exceeding two people, if they do not share the same household.

By 16 June 2020, 186,839 cases were reported with 8,800 deaths (4.7% death rate) and approximately 173,100 recoveries. The low preliminary fatality rate in Germany, compared to Italy and Spain, resulted in a discussion and explanations citing the country's higher testing, higher amount of available intensive care beds with respiratory support, absence of COVID-19 analyses in post-mortem tests, and higher amount of positive cases among younger people.

The head of the Robert Koch Institute had warned that the German death rate would increase over time. However, as of 28 September 2020, Germany officially has reported 285,332 confirmed cases with 9,460 deaths (3.3% death rate) and 252,500 recoveries. The death rate has rather decreased since June, 2020 and Germany's mortality rate per 100,000 is among the lowest in Europe. Only 660 deaths have been added since mid June 2020; quite less in comparison to other countries such as the USA and India.

The German strategy was a considerable success because of its strong public health system, efficient and decisive governance, educated masses, and healthy communication with public.
Built over a course of period through the efforts of many governments, the German health-care system was well prepared with COVID-19 at its doorstep. A strong network of general practitioners ensured that the mild cases were handled with expertise by them, while hospitals catered to more severe cases. Overall, everyone had full access to medical care.

Further, Germany utilised the considerable time to prepare for the onslaught of the outbreak. Taking the COVID-19 threat seriously from the beginning, the country's ICU capacity was increased by 12,000 beds to 40,000 by freeing up intensive care beds, and pushing back elective surgeries to stay prepared for potential COVID-19 patients. Thus, hospitals in Germany were not overwhelmed and were even treating airlifted critically ill patients from neighbouring countries such as Italy and Spain. Many hospitals also shared data with a federal website to map out their supply chain needs, relative to other facilities. The website is now serving as a live-dashboard of all available ICU beds in participating hospitals across the country. Finally, with a population of around 83 million people, Germany has been able to perform up to one million diagnostic tests per day.

The country further encouraged mental health wellbeing, by endorsing activities with appropriate physical distancing and consistent social interaction through video calls to cope with isolation.

Lastly, disinformation and rumours were fought with the help of a strong and accessible education system along with regular public communication. Scientists had honest and open communication with the public, sharing complex ideas and guidelines with the public. This instilled confidence and generated public support for the efforts of the government system.

2. Japanese Containment Model

The Japanese Government adopted various measures for the prevention and mitigation of the outbreak, after the first known case of COVID-19 in the country was confirmed on 16 January 2020 in a resident of Kanagawa prefecture who had returned from Wuhan, China. On 30 January 2020, Prime Minister Shinzo Abe established a national task force to oversee the government's response towards the pandemic. On 27 February 2020, he requested the temporary closure of all Japanese elementary, junior high, and high schools until early April 2020.

As the pandemic became a concern for the 2020 Summer Olympics, the Japanese government and the International Olympic Committee negotiated its postponement until 2021. On 7 April 2020, Prime Minister Abe proclaimed a one-month state of emergency for Tokyo and the prefectures of Kanagawa, Saitama, Chiba, Osaka, Hyogo and Fukuoka. About a week later on 16 April 2020, he expanded the declaration to encompass the rest of the country. The emergency was lifted on 25 May 2020.

No restrictions were placed on residents' movements, and businesses from restaurants to hairdressers stayed open. People's movements were not tracked through technology based methods. The country doesn't even have a centre for disease control. In fact, Japan tested just 0.2 per cent of its population — one of the lowest rates among developed countries. Yet the first wave curve was flattened, with deaths well below 1,000. By 25 May 2020, the day when emergency was lifted, there were 16,581 confirmed cases, 830 fatalities and 2,139 active cases. The active cases came down to just 770 on 20 June 2020.

Due credit was given to the role of Japan's contact tracers, who swung into action soon after the first infections were traced in January. Japan's public health centres proved to be extremely advantageous as the country has a huge health workforce, experienced in infection tracing such as influenza and tuberculosis. These local experts focused on tackling so-called clusters, or groups of infections from a single location such as clubs or hospitals, to contain cases before they got out of control.

Instead of social distancing, Japan promoted simple messaging of avoiding the "Three C's" closed spaces, crowded spaces and close-contact settings - rather than keeping away from others entirely.

Epidemiologists also highlighted Japanese people's health consciousness as possibly the most important factor. Also, the possibility that the virus strain spreading in Japan may have been different, and less dangerous, to that faced by other nations, was also raised.

Second Wave Infections

However, things took a turn against the Japan model of no lockdown and limited testing, as cases started increasing once the state of emergency was lifted in late May 2020. Unfortunately, Japan now risks becoming an example of haste; as it moved too early to normalise its economy. With the officials encouraging full re-opening of businesses, by June, restaurants and bars were fully open, sports events such as baseball and sumo-wrestling were resumed as usual.

As of 28 September 2020, Japan registered 82,131 confirmed cases of COVID-19 with 1,548 deaths and 5,593 active cases. Infections first concentrated in the capital have spread to other urban areas, while regions without cases for months have become new hotspots. Experts cite a hasty reopening, along with an absence of proper reopening strategy. Contradictory and confusing communication from central and regional governments were also observed. For instance, while the national government encouraged travel, local officials in Tokyo warned against it. A blame game ensued.

The national government stands by its decision against another state of emergency, as citing the low death rate and fewer critical cases. However, public health experts view these parameters as a success of the treatment facility and believe that the government should rather evaluate its success through containment strategies. "Hospitals can treat the infected but only the government, through public health measures, can reduce the number of infected people," said Koji Wada, a public health professor, at the International University of Health and Welfare in Tokyo.

Photo Source: -Japan pon August 7,2020_CFP

C) Alternate Strategies

The strategies of two countries stand out the most when it comes to alternatives to complete lockdown. While South Korea strengthened its contact tracing and testing mechanism to track and treat every case possible within its territory, Sweden relied on individual responsibility rather than forced lockdown.

1. South Korean Model

At the peak of outbreak, South Korea was having an exponential daily rise in cases, even more than that of Italy, with around 950 new cases reported on a single day. Since then, a series of measures were taken by the government which ensured a flattening of the curve, resulting only in 9000 odd cases with just 131 deaths till the third week of March 2020. By 16 June 2020 the country had recorded 12,155 confirmed cases and 278 deaths. Clearly, South Korea effectively controlled the first wave of COVID-19, unlike many other countries. Due credit goes to their unique approach which yielded such extraordinary results. In its efforts to fight and contain the virus, South Korea combined testing with contact tracing.

South Korea adopted a strategy that rested on four major pillars:

1. The first pillar is of transparency and complete openness in sharing updated information on new infection, through Korea Centre for Disease Control simultaneously with all the stakeholders including the media. The experiences of SARS-2002 and MERS-2015 came in handy and the people were well aware of the drills to be followed.

2. The second pillar was of containment and mitigation. As the Coronavirus is highly contagious; immediately after the spread of information, all the suspected people were tracked and every confirmed case was traced and contained in a location. Mitigation involved a lowering of the peak of the outbreak through social distancing campaign, introduced just after the big break of the pandemic in the Daegu region at the end of February 2020. South Korea has managed to restrict the community spread to Daegu only, which has 85% of Korea's cases. It also decided to close all schools and impose voluntary restrictions on large gathering. It is to be noted here that no city was put under lockdown. Thus, their containment policy was highly successful.

3. The third pillar was the implementation of triage and treatment system developed during MERS epidemic of 2015. In the triage system, 5 isolation hospitals were created for critical and severe cases, whereas mild to moderate cases were sent to community hospitals. Hotels, gyms and residential complexes were revamped for new hospital beds. Thus, they continued to enhance their capacity and utilised their existing capacities to their help.

4. The fourth pillar promoted massive screening and fast tracking of suspect cases, underpinned by accelerated production of diagnostic kits, with a weekly diagnostic capability of 4,30,000. It is to be noted that anyone could go for the test and the report was available by evening. This process of testing was free of cost, and once any person was confirmed of the disease, the other three pillars were implemented to ensure that the virus did not spread beyond the local borders. South Korea carried out the most number of tests, especially among high risk group individuals, to contain the virus. But health experts believe that is not a practical solution for a country like India with over a billion population.

Thus, using these four pillars, South Korea staged an exemplary fight against the pandemic of COVID-19, despite being impacted severely in the initial stage.

Second Wave Infections

South Korea started witnessing the beginning of a second wave of infections in mid-August when the active COVID numbers started getting recorded in triple digits. As of 29 September 2020, there have been 23,699 confirmed cases of COVID-19 with 407 deaths in South Korea.

Reports have been suggesting that a major reason behind the second wave has been the disagreement of the conservative church groups with the Government's health policy measures. Since the outbreak of the virus and an increase in infection numbers, the South Korean government has limited indoor gatherings to 50 people and outdoor gatherings to 100 people. Certain church groups across the country have been eyed by the Government as violators of these new impositions.

In mid-August 2020, South Korea reported approximately 279 new COVID-19 cases, the first time since March. At least 300 new cases were linked to the Sarang Jeil church, according to the Seoul metropolitan government. Infections were first recorded among church members on 12 August 2020 following which the head pastor and other church members violated government rules by participating in a mass anti-government rally in central Seoul, on 15 August 2020. After speaking at the rally, the pastor tested positive for COVID-19, along with 739 other members of the church.

Further, the health officials in the country have unrestricted access to individuals' private mobile data. Smartphone GPS history was used to track and share the locations of confirmed patients, which was earlier being shared on government websites as well. While the names were kept anonymous, other details including age, gender and workplace were available.

2. Swedish Model

Placing faith on individual responsibility, Sweden has left its schools, gyms, cafes, bars and restaurants open throughout the spread of the pandemic. Instead, the government has urged citizens to act responsibly and follow social distancing guidelines. By 16 June 2020, 51,614 confirmed cases with 4,874 deaths were registered in the country. As of 29 September 2020, there have been 90,923 confirmed cases of COVID-19 with 5,880 deaths.

As per Anders Tegnell, the strategy's architect, an epidemiologist at Sweden's Public Health Agency, the Swedish laws on communicable diseases are mostly based on voluntary measures, on individual responsibility. It clearly states that the citizen has the responsibility not to spread a disease. There is not much legal possibility to close down cities in Sweden using the present laws. Quarantine can be contemplated for people or small areas, such as a school or a hotel. But legally they cannot lock down a geographical area.

The country is coming under flak for this approach. 22 acclaimed scientists highlighted that public-health authorities had failed, and urged politicians to step in with stricter measures. They pointed to the high number of coronavirus deaths in elder-care homes and Sweden's overall fatality rate, which is higher than that of its Nordic neighbours - 131 per million people, compared with 55 per million in Denmark and 14 per million in Finland, which have adopted lockdowns. Anders Tegnell explicitly worries that the Denmark will struggle to find a way out of the lockdown. The moment they start releasing the lockdown measures, there could be a panic as cases start rising again.

Further, the chart depicting daily new admissions into Swedish critical care with COVID-19 appears to have been roughly flat for the past couple of weeks. Above all, in those places where the virus was already widespread, such as the UK, Italy and Spain, lockdown hasn't correlated with a flatter curve.

Death rates per million is not the only data point in this difficult equation. It is important to analyse the balance between protecting people as reasonably as possible against this new threat, while limiting collateral damage of the country in the process.

Between 31 August and 6 September, 2020 (counted as Week 36 by the authorities) Sweden carried out 126,219 tests for ongoing COVID-19 infection of which only around 1,300 (1.2 per cent) came back positive. This was the first time the country of ten million population met its national goal of over 100,000 tests a week, since setting the target in mid-April 2020. The positives turned to be much lower than the 19 per cent positive tests during some weeks in April 2020. The country has the lowest rate of spread in Scandinavia.

Conclusion

While China has been showcasing its strategy of aggressive shutdown, along with use of surveillance as a key to its success in handling the crisis, it comes with grave socio-economic costs. Not all countries, especially democracies, can afford to successfully replicate the China strategy, without compromising its economy and individual rights.

On the other hand, South Korea never had to implement a lockdown, it promoted behavioural change among its citizens to

learn to live with the virus. As a result, the economy did not crash like many other countries. Similarly, Sweden ramped up its testing capabilities while relying on individual responsibilities and adaptive capabilities. Japan's limited testing and no lockdown model has come under serious questioning, since the resurgence of the virus in the country.

The rising second wave of infections all over Europe as of October 2020 in countries that implemented complete as well as partial lockdowns, is a serious concern. Even Sweden, the country that did not implement a lockdown, observed a steady increase in cases September 2020 onwards. While, increased testing could also be responsible for this rise, other epidemiological observations must not be ignored.

Needless to say, COVID-19 has impacted countries without discrimination; developing, as well as developed countries are reeling under the adversities of the global catastrophe. Considering the diversity of circumstances and dynamic changes; at this point of time, it would be unwise to declare a single strategy as the most effective one. However, each country has provided India with lessons to learn and adapt.

Photo source -OliScraff_AFP via Getty Images

USA

Norway

UK

Nepal

Latin America

Srilanka

South Africa
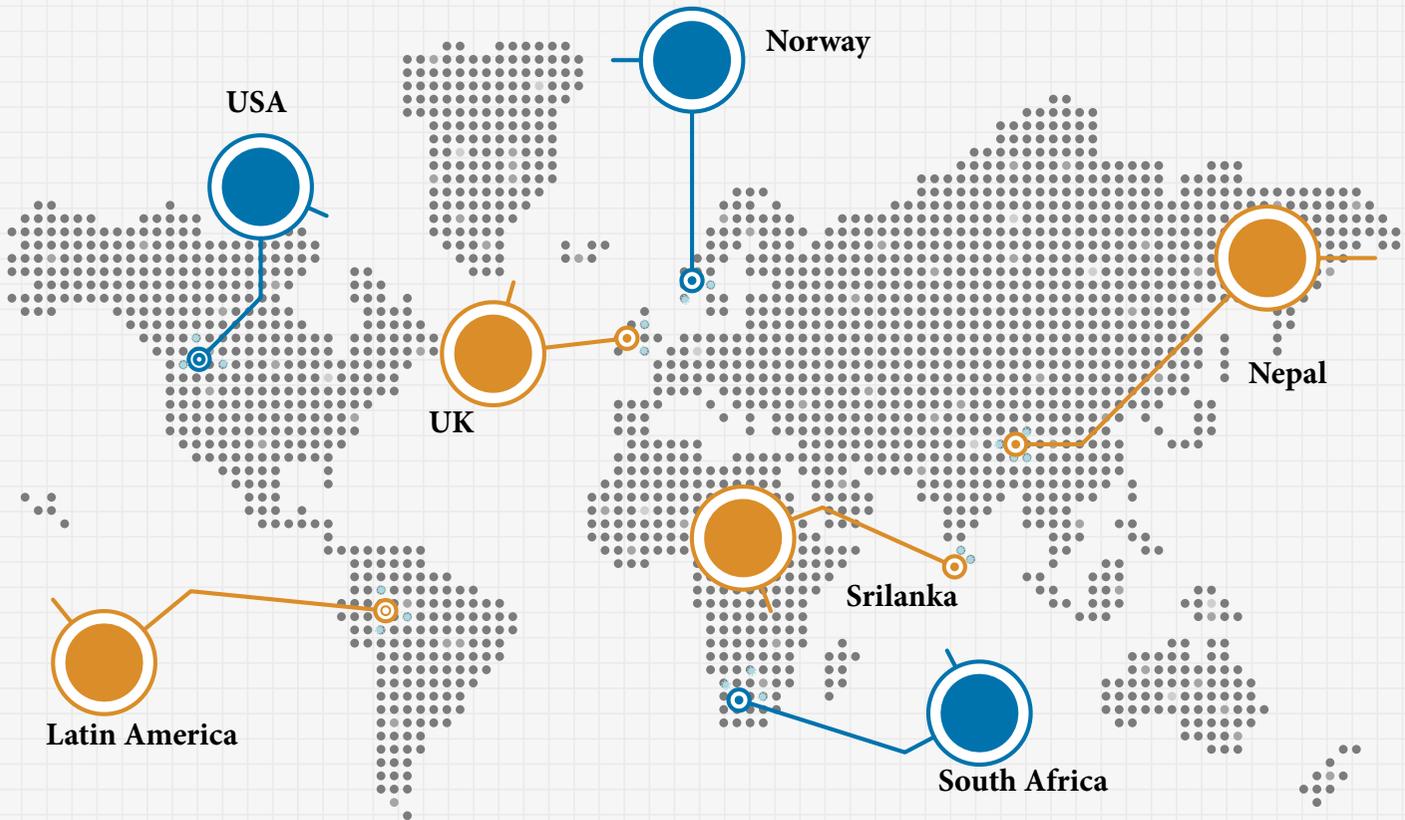
Looking through the Kaleidoscope
COVID-19 situation around the world

COVID-19 is an unprecedented global health challenge that has reached almost every nook and corner of the world. The following unit is a kaleidoscope of COVID-19 coverage from around the world. These international stories provide an insider's view on the pandemic situation and subsequent management in Norway, the United Kingdom, the United States of America, Sri Lanka, Nepal, Latin America and Africa. We hope that when it comes to the impact of COVID-19, this section is able to showcase the similarities as well as differences in both developed and developing regions.

Source: REUTERS

Coronavirus in Norway

The response to the Coronavirus in Norway may be characterised as 'relaxed vigilance'.

As of 'vigilance'; the health authorities' message to the population is that the virus is dampened by social distancing, seeking medical help when symptoms are evident, social isolation/quarantine according to health regulations, and alertness to the need to protect at-risk groups. Otherwise, people are urged to adhere to the Government's continually updated advice presented in the electronic and print media. For example, as of this day of writing this; face mask use in public is not yet a government recommendation, but there are signs that this is soon to come.

As of 'relaxed,' the health authorities' message

is that COVID-19 affects different people in different ways, but most infected people will develop mild to moderate illness and recover without hospitalisation. This advice is based on preliminary findings from the short term follow-up of Norway's early cases. As knowledge advances about possible Corona virus-induced long term morbidity and disability, the population may become more alert to the (possible) seriousness of the virus as a long term threat to the country's health.

According to the national public health authorities, approximately one percent of Norway's population has been infected by SARS-CoV-2, as of August 2020. This relatively low rate is attributed to the success of disease control measures. The health consequences

directly attributable to the virus seem modest, and this sows confusion in many minds because the public discourse has a disaster tone.

However, the social consequences of disease control measures impact a much broader swath of the nation. This aspect is taken up later in this report. As of the health situation, the Norwegian Institute of Public Health summaries the present status as follows:

"Monitoring data and modelling show that the spread of infection is still at a low level. Following a decrease in reported COVID-19 cases from week 13, there has been an increase in the number of reported cases in the last two weeks (196 cases in week 31 and 94 cases in week 30). The number of hospitalisations and admissions to intensive care units is still low. The number of COVID-19 associated deaths have fallen weekly since week 15. The general mortality rate in the population is calculated to be normal in recent months. Mathematical modelling indicates an increasing spread of infection in mid-July. So far, in the epidemic, it is estimated that about 0.7 per cent of the population has been infected with COVID-19. The overall monitoring shows an increase in infection rates last week, but still a low spread of COVID-19 in the population (5.4 per 100,000 inhabitants in the last two weeks). Infection occurs mainly around known cases, and in connection with travel activity, local outbreaks, and clusters. It is too early to conclude whether the increase in outbreaks in recent weeks is the beginning of an upward trend. Increased travel activity seems to result in somewhat

How much social distance?
Keep your distance to help slow down COVID-19

Advice for everyone
- Follow good cough etiquette and good hand hygiene.
- You and your closest circle can be together as normal.
- Keep a distance of at least 1 metre from everyone but your closest circle.
- If you have respiratory tract symptoms you should stay at home.
- If you have symptoms of COVID-19 you should be tested.

You are a CLOSE CONTACT
A distinction is made between "household members and equivalent close contacts" who need to be in quarantine and "other close contacts". You will be told which applies to you.

Other close contacts:
FOLLOW-UP FOR 10 DAYS
- You can go to school or work.
- Check daily for symptoms of respiratory tract infections or if you feel unwell.
- You should be tested as soon as possible and be re-tested after 2–3 days.
- If you are a healthcare worker and have contact with patients, inform your employer to assess if you should go to work.

Household members or equivalent:
QUARANTINE FOR 10 DAYS
- Do not go to work or school.
- Do not use public transport.
- You can go for a walk, but keep a good distance from others, well over 1 metre.
- You can carry out necessary errands to the supermarket or pharmacy.
- Avoid visits.

FOR ALL CLOSE CONTACTS:
- Limit the number of people you have close contact with, avoid large gatherings and crowds.
- People who live together can be in normal contact.
- People you live with are not in quarantine.
- If you have symptoms of respiratory tract infections you should isolate yourself and be tested.
- A negative test does not shorten the time in quarantine/follow-up.
- A positive test result means that you go into home isolation.

You have confirmed or probable COVID-19 and are in HOME ISOLATION
- Stay at home.
- Keep away from household members.
- If possible, use your own room and bathroom.
- Clean surfaces frequently.
- Ask someone to help you with food shopping.
- Discuss with your doctor how you should monitor your health.
- Your household members are in quarantine.

NIPH

Updated 2020-06-05

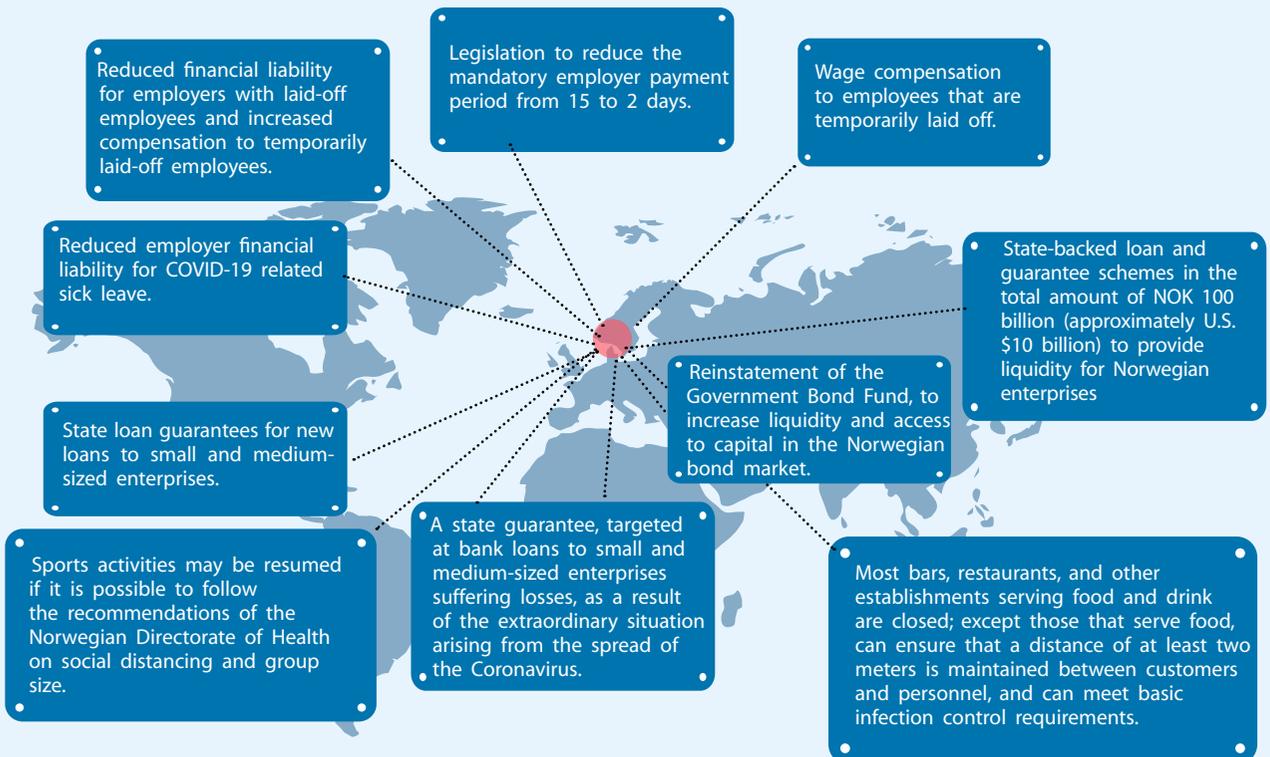Applies for quarantine after international travels as well

increased imports of infection, and mainly from countries covered by the quarantine obligation. This will be closely monitored in the future. Identified cases must be followed up locally through tracking of close contacts, isolation of those who are ill, high test capacity, and implementation of quarantine according to current advice." Based on the above assessment, the Government's main advice to the population is to maintain social distance. Travel advisories are constantly changing as the situation evolves in Norway and other countries. The Government communicates its advice about social distancing using the graphic in the previous page.

As to social consequences of Coronavirus in Norway at the family and community levels, research is underway to chart mental health, domestic violence, temporary as well as long term unemployment effects on industry and business, and local economic effects of business closures along with facility restrictions (spaced seating in restaurants and in public transportation, and many similar interruptions to daily social life). Little is yet known about the extent of social sequela of the disease control measures. However, the public discourse on this theme dominates social attention on TV, in the newspapers, and social media, along with the homes, workplaces, and other gathering places of the country.

The Government as well as non-governmental agencies and organisations have mounted a broad response to mitigate the impact of Coronavirus on the social and financial life of the country.

Present Situation in Norway

Reduced financial liability for employers with laid-off employees and increased compensation to temporarily laid-off employees.

Legislation to reduce the mandatory employer payment period from 15 to 2 days.

Wage compensation to employees that are temporarily laid off.

Reduced employer financial liability for COVID-19 related sick leave.

State-backed loan and guarantee schemes in the total amount of NOK 100 billion (approximately U.S. $10 billion) to provide liquidity for Norwegian enterprises

State loan guarantees for new loans to small and medium-sized enterprises.

Reinstatement of the Government Bond Fund, to increase liquidity and access to capital in the Norwegian bond market.

Sports activities may be resumed if it is possible to follow the recommendations of the Norwegian Directorate of Health on social distancing and group size.

A state guarantee, targeted at bank loans to small and medium-sized enterprises suffering losses, as a result of the extraordinary situation arising from the spread of the Coronavirus.

Most bars, restaurants, and other establishments serving food and drink are closed; except those that serve food, can ensure that a distance of at least two meters is maintained between customers and personnel, and can meet basic infection control requirements.

Writing for KPMG (a global network of independent member firms offering audit, tax, and advisory services), Anders H. Liland and Per Ivar Skinstad summarise the present situation in Norway succinctly:

The role of public health in tackling the Coronavirus is a main topic of conversation. As one might imagine, the measures summarised above; mainly the last two, have resulted in a storm of public debate. Nevertheless, the public seems satisfied with the Government's actions. According to public opinion research by The Norwegian Public Monitor, 9 out of 10 Norwegians support the Government's measures to limit the spread of the virus. There is less faith in the ability of Government organisations to cope with the surge in social security cases that arise from the control measures. Just 22 percent of those polled indicate they trust the Norwegian Labour and Welfare Administration to handle well the increased applications for Coronavirus-related welfare benefits.

Yet, the population is trying to do its part. Data from the Norwegian Public Monitor indicate a high rate of compliance with control measures, even if one in three finds it challenging to know if they are following the guidelines that apply to them.

• Eighty six per cent are avoiding family and friends.

• Two out of three worked out of their homes during the first week of strict measures.

• Thirty-one per cent find the new everyday life after the Coronavirus outbreak to be psychologically challenging.

• Sixty-eight per cent of parents find that their children's digital/homeschooling is providing an acceptable alternative to the now-closed schools.

• Eighty-six per cent are avoiding contact with family and friends. The number of people who respond that they have contact with others is reduced daily. The largest number of people who maintain contact with friends and family are in Northern Norway, where the virus has spread the least.

• 76 per cent have cancelled or postponed holidays.

COVID-19 in the United States of America

Introduction

The COVID-19 pandemic was confirmed in the United States of America on 20 January 2020 when a man who had returned from Wuhan, China on 15 January 2020 from visiting family, to his home in Washington, sought medical attention on 19 January 2020. As of 30 September 2020, the United States remains the most affected country with 7,077,015 total confirmed cases, of which 203,875 persons have deceased.

The US is among the worst-hit of developed nations in terms of its death rate. In fact, as per some demographic estimates, for the first time since World War II, the country's life expectancy at birth could drop by a full year. In other words, the pandemic has temporarily nullified the gains made during the past 15 years against all other causes of death.

Status of COVID-19 in the USA

The US has the highest number of confirmed infections in the world - about 25 per cent of the global total, despite having less than 5 per cent of the population. After the initial spike in late March 2020, social distancing restrictions gradually brought down the infections with cases stabilising by May 2020. But as states lowered lockdown measures, cases began to rise, reaching a countrywide high in July 2020.

California, Texas and Florida - the three most populous U.S. states - have recorded the most Coronavirus infections and have long surpassed the state of New York, which was the epicentre of the outbreak in early 2020.

Initial Response to COVID-19

Despite significant resource based advantages including biomedical and scientific expertise, the US is among the worst COVID-19 hit nations. While countries such as South Korea, Thailand, Japan and Australia acted decisively to bend the curve of infections downward, the US was merely able to plateau in spring 2020, which too changed into a dramatic upward slope in the summer.

Public health experts pin pointed a number of concerning factors that led to this situation. A major reason is the US Government's response being a 'a patchwork of responses by state and local governments, divided sharply along partisan lines'.

As per Ronald Klain, who coordinated the US response to the West African Ebola outbreak in 2014, by early February 2020, the country should have triggered a series of actions, precisely zero of which were taken. Those crucial early weeks could have been used for mass-producing tests to detect the virus, asking companies to manufacture protective equipment and ventilators, and otherwise steeling the nation for the worst. Instead, President Trump focused on the border.

On 31 January 2020, President Trump announced that the US would bar entry to foreigners who had recently been in China, and urged Americans to avoid going there. While travel bans sound sensible, in practice, they are not that efficient at restricting either travel or viruses as they prompt people to seek indirect routes via third-party countries, or to deliberately hide their symptoms.

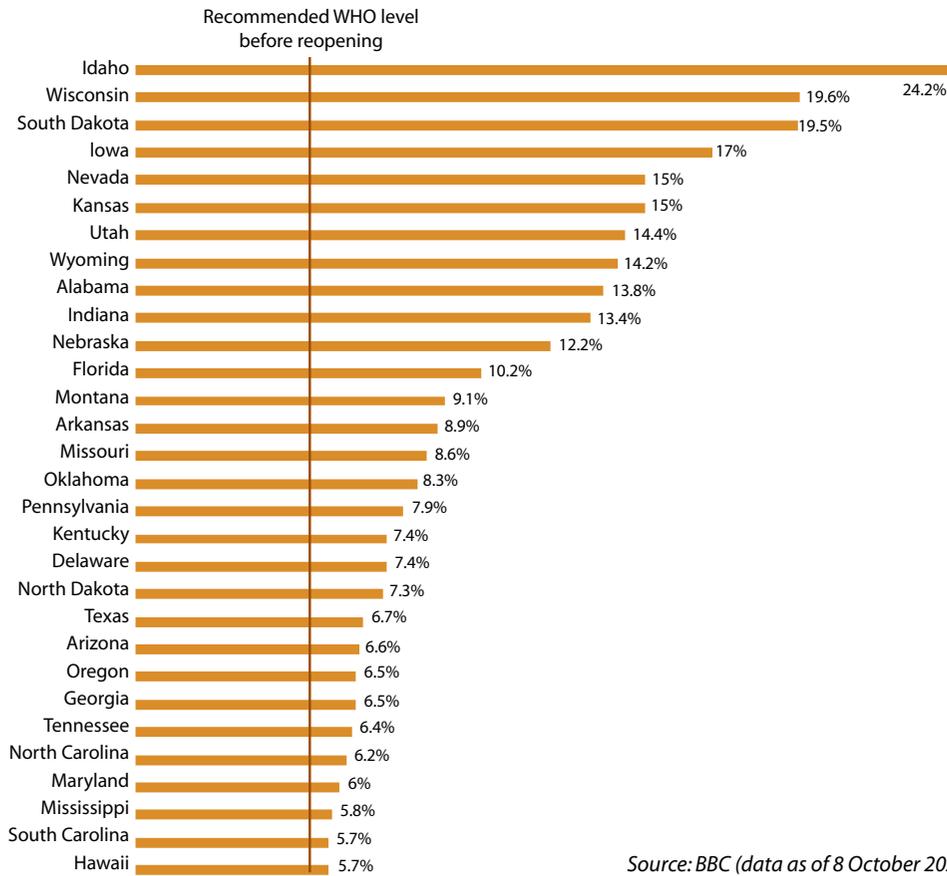President Trump's travel ban included numerous exceptions, and thus, being porous, allowed thousands of people to enter from China. Further, when he later announced a ban on flights from continental Europe, a surge of travellers packed America's airports to manage before the ban became active. Additionally, the ban can create a harmful false confidence as less focus on testing, tracing, building up the health system is given. In April 2020, the US President made a fundamental policy shift that majorly shaped the US response to the pandemic. He shared that states would have primary responsibility for containing the virus, with the federal government in a "back-up" role. This built a lack of an overall national response and resulted in extreme variation in the national response to COVID-19 by and within states. For instance, as of August 2020, 33 states had instituted mandatory mask orders, while other states imposed softer orders, or none at all.

Another prominent reason accounting for the degrading COVID-19 management in the US could be located in the neglected and underfunded state, and local public health system.

The Ever-rising Case Load

The country has once again witnessed a dramatic rise in the cases post August 2020. One contributing factor of the rising cases in the US has been the return to school for students. As per a study by the US Centres for Disease Control on about 100,000 COVID-19 cases reported between 2 August and 5 September 2020 - around when college students began returning to school; weekly cases among those aged 18-22 increased by 55 per cent nationally. The greatest increases came from the Northeast (which includes New York, Connecticut and New Jersey) and the Midwest, which is a region located west of the Northeast, including Illinois, Indiana, Ohio and Wisconsin. By first week of October 2020, about 130,000 cases were identified in more than 1,300 American colleges.

US States with Positive Case Rate Above 5 Per cent

Recommended WHO level
before reopening

State	Rate
Idaho	24.2%
Wisconsin	19.6%
South Dakota	19.5%
Iowa	17%
Nevada	15%
Kansas	15%
Utah	14.4%
Wyoming	14.2%
Alabama	13.8%
Indiana	13.4%
Nebraska	12.2%
Florida	10.2%
Montana	9.1%
Arkansas	8.9%
Missouri	8.6%
Oklahoma	8.3%
Pennsylvania	7.9%
Kentucky	7.4%
Delaware	7.4%
North Dakota	7.3%
Texas	6.7%
Arizona	6.6%
Oregon	6.5%
Georgia	6.5%
Tennessee	6.4%
North Carolina	6.2%
Maryland	6%
Mississippi	5.8%
South Carolina	5.7%
Hawaii	5.7%

Source: BBC (data as of 8 October 2020)

Another compounding factor is the change in seasons, as the arriving cold weather will drive people indoors to more constrained environment with potentially poor ventilation, where the risk of spread is heightened. Further, in general, viruses tend to survive more easily in cold conditions. Additional fears are arising out of the possible injunction of COVID-19 with the US influenza season, which typically begins in October. This might pose a great challenge for the health system in the country.

Way Forward

It is quite baffling to witness the US, a nation significantly involved in capacity building of other countries for events like COVID-19, struggling to control a pandemic within its own boundaries. Even though the US lacks a national strategy for testing and conducting surveillance for COVID-19, it has previously helped other countries develop such strategies for other diseases.

To begin with, the country requires a national level response strategy to implement some of the most basic public health preventive measures across the country. Beyond a basic national level plan, the states can design their own response strategies as per the regional requirements. For instance, basic measures such as wearing a mask and maintaining physical distance can be made mandatory at national level, while more severe measures such as shutdowns and limitations on gatherings can be implemented as per the local population density, occupation mapping, etc.

Undoubtedly, the country's health and economic security will continue to be adversely affected until governance level changes are made.

COVID-19 in Africa and Latin America

The COVID-19 pandemic was confirmed in South America much later than other world regions, with the first positive case found in Brazil on 26 February 2020. By 3 April 2020, all countries and territories in South America had confirmed at least one case. The first case in Africa was confirmed on 14 February 2020 in Egypt. Within three months, the virus had spread throughout the continent, as Lesotho, the last African sovereign state to have remained free of the virus, reported a case on 13 May 2020.

During the first quarter, most countries in Africa and Latin America did not have as many cases as Asia, Europe and North America. However, the trend changed for worse as newer countries, especially in South America, were engulfed by significant number of COVID-19 confirmed cases and mortality.

Majority of Africa and Latin America were under strict lockdown. Countries such as Argentina, imposed some of the longest lockdowns in the world. However, lockdowns have led to significant economic costs all over the world, putting livelihoods at risk and pushing populations into poverty. Governments in both Africa and Latin America have faced the harsh conundrum; to choose between protecting public health through extreme restrictive measures versus acting for the much-needed economic recovery.

Status of COVID-19 in Latin America

As of 30 September 2020, three of the top six most infected countries in the world - Brazil, Colombia and Peru were located in South America. While much of the global spotlight of COVID-19 in South America has focused on Brazil, the region as a whole is facing a humanitarian crisis. The continent comprises about 5.5 per cent of the global population. Yet, it accounted for more than 20 per cent of reported COVID-19 deaths as of September 2020.

Brazil had confirmed the third highest death toll in the world after the US and India, as of 30 September 2020 with 142,058 deaths. President Jair Bolsonaro dismissed the virus as a "little flu" and opposed lockdown strategy, despite being infected with the disease himself. He used terms such as 'hysteria', 'fantasy created by media' and 'neurosis' to downplay the severity of the pandemic situation. Most South American countries have, however, followed WHO recommendations far more closely. As their first COVID-19 cases were confirmed in March 2020, Bolivia, Colombia, Ecuador, and Peru implemented some of the longest and strictest lockdowns in the world. Much of Latin America has been locked down since mid-March 2020, with some countries such as Colombia only lifting nationwide restrictions at the start of September 2020. The region has seen some of the longest lockdowns in the world, with citizens in many cities advised to leave their homes only when absolutely necessary. Even though Brazil, Peru, Colombia, Chile and Argentina are among the most affected countries, citizens are abandoning physical distancing.

Considering its population, Chile has one of the worst outbreaks in the world, with more than 27,000 cases and 1,000 deaths per million inhabitants. Initially, the number of fatalities

reported was lower than other countries in South America, even with less cases. However, in May 2020, while the official number of cases and deaths increased rapidly, several sources reported additional numbers of excess deaths which were not counted. By June 2020, the Government confirmed thousands of additional deaths due to COVID-19, including suspected cases where PCR tests were not available.

In the second quarter, Brazil, Chile, Colombia, Mexico, and Peru lost a combined 30 million jobs, with female, young and low-educated workers hit particularly hard. Although many jobs will be recovered as the activity resumes, current estimates point to lasting income losses, potentially reversing some of the social progress achieved till the pandemic.

COVID-19 Management in Latin America: Behind the Curtains

As per experts, there are several factors in Latin America that make this pandemic more difficult - inequality, poverty surrounding big cities, informal economies, and difficult areas of access. Latin American countries have had some of the most persistent income inequalities in the world, which are unfortunately predicted to worsen with the pandemic.

The economies are largely informal, with the informal labour market making up 54 per cent of all work across the region, even up to 70 per cent in countries such as Peru. This vast majority of unorganised workforce has minimal access to social protection, and their capability to follow quarantine and social distancing measures is limited. Overall, they also have less access to health care. Many of those working informally, in jobs like construction and domestic work, are often without bank accounts and unable, or ineligible, to receive any government support.

Political power is also extremely concentrated in Latin American countries. Rising inequalities have driven domestic political tensions, and social unrest in Colombia, Bolivia, and Chile. There is corruption in the use of public resources, which often results into a strengthened private sector at the face of deteriorating public health services. Only few countries in the region, most notable being Brazil, have universal health care without which tackling the pandemic will be extremely grinding.

COVID-19 Jump in Argentina: November 2020 Update

Argentina had been repeatedly cited as an example in the containment of the Coronavirus in Latin America. As of 30 September 2020, the country had 723,132 confirmed cases of COVID-19 and just 16,113 deaths. However, as the nation relaxed its confinement measures, the country as of 26 November 2020 confirmed 1,381,795 COVID-19 cases, the ninth highest tally worldwide and second highest in South America, surpassed only by Brazil.

Despite many measures remaining in place, the outbreak has intensified in the past few months, especially in Buenos Aires province. The government has relaxed many restrictions, though domestic and international travel is still tightly restricted.

Status of COVID-19 in Africa

The first case in Africa was confirmed in mid February 2020. By the second week of June 2020, Africa had surpassed 200,000 cases in total. The continent took 98 days to record the first 100,000 cases, and just 18 days for the second 100,000. The number exceeded a million by 6 August 2020, with five countries - South Africa, Egypt, Morocco, Ethiopia and Nigeria comprising over 75 per cent of the total confirmed cases.

The highest number of infections in Africa have been in South Africa, followed by Morocco, Egypt, Ethiopia and Tunisia. The first case in South Africa was confirmed on 5 March 2020, with a male citizen testing positive upon his return from Italy. The first death due to the disease was reported on 27 March 2020. The implementation of the restrictions came at a huge cost. Livelihoods were lost on a large scale. South Africa, which had one of the most stringent lockdowns in the world, lost 2.2 million jobs during the first half of the year. More and more African countries have been forced to re-open their economies, even though the number of cases is much higher than when they ordered the shutdowns.

In Ethiopia, the national Government declared a five-month state of emergency in April 2020 while allowing economic activities to continue during the public health crisis. Despite that, the pandemic has affected Ethiopia's flower export industry significantly. After Europe was hit with the COVID-19 pandemic, the demand for flowers has plummeted, and the price dropped by more than 80 per cent. More than 150,000 employees in this industry are also at the risk of losing their jobs.

Further, in countries such as Nigeria and Angola, oil accounts for as much as 70 to 75 per cent of the total government revenue and 90 per cent of export earnings. The decline in revenues from oil exports and commodities has also constrained the ability of these African countries to generate the required revenue, to cope with the pandemic. In Ghana, the female dominated informal sector has been adversely affected by the lockdown. The national economy has plummeted due to global crash of crude oil prices, along with the national lockdown. Between March and June 2020, for example, Ghana's tourism and hospitality industry, the

country's third-highest foreign exchange earner, was estimated to have incurred losses of USD 170 million.

COVID-19 Management in Africa: The Big Picture

It was feared that the pandemic could pose extreme challenges in Africa, in terms of pandemic control as well as huge economic crises. This was because rural Africa has inadequate healthcare systems, having problems such as lack of equipment, lack of funding, insufficient training of healthcare workers, and inefficient data transmission. Further, urban Africa poses additional risk factors for the spread of COVID-19 in the form of congestion in major cities, high population density in slums, and poor urban planning. These factors directly hinder physical distancing, personal hygiene and sanitation, as well as movement.

However, as of September 2020, the continent has displayed low mortality, as compared to other continents. The mortality rates of African countries are relatively low compared to Europe, due to the younger age of their populations; with more than 60 per cent population under the age of 25. It is also believed that the pre-existing expertise in epidemic control, cross-immunity from other Coronaviruses, and low travel along with outdoor living could also be contributing to Africa coping better.

There are several reasons that are being cited for Africa's low COVID-19 numbers. For one, most African governments took drastic measures to slow the spread of the virus right from the beginning. Public health measures including avoiding handshakes, frequent hand-washing, social distancing and wearing of face masks were swiftly introduced.

Further, the pandemic came at a time when the Democratic Republic of Congo was dealing with its biggest outbreak of Ebola, yet. Neighbouring states were on high alert, and

the health screening of travellers for Ebola was extended to include COVID-19. Several West African states, which battled the world's worst ever outbreak of Ebola from 2013-16 had also mastered the public health measures that have been used to prevent COVID-19, including isolating the infected, tracing their contacts and then getting them quarantined while they get tested.

However, the case numbers could be much higher in reality than the confirmed counts, due to low testing rates in many African countries. "Most African countries are focused on testing travellers, patients or contacts, and we estimate that a significant number of cases are still missed," says the WHO's Matshidiso Moeti. Just ten countries - South Africa, Morocco, Ethiopia, Egypt, Kenya, Nigeria, Cameroon, Rwanda, Uganda and Ghana - account for about 75 per cent of the total tests conducted in Africa.

Way Forward

In Latin America, policies should remain focused on containing the pandemic and cementing the recovery. Premature withdrawal of fiscal support should be avoided. However, further support should be accompanied by explicit, legislated and clearly communicated commitments to consolidate as well as rebuild fiscal defences over the medium term.

While some Latin American countries are promoting diagnostic and vaccine related R&D, African countries currently do not manufacture diagnostic tools domestically, and import more than 90 per cent of their pharmaceuticals. Further, Africa does not produce vaccines. This high dependence on imports further makes African health security extremely vulnerable. Limited testing is happening across the African continent, making it impossible to draw any useful conclusions or comparisons. Thus, it is believed that the true impact of the pandemic will only be known in the coming several years.

Photo Source: - Nurphoto via gettyimage

COVID-19 Management in Nepal

Background

The first case of COVID-19 was detected in January 2020 in Nepal, and by 16 September 2020, it rose to a total of 58,327 cases. In view of this alarming situation, Nepal declared National Public Health Emergency on 23 March 2020, including lockdown of the country for almost 4 months. The pandemic in India has resulted in the massive inflow of Nepali migrant labourers back to Nepal. Individuals coming from abroad are kept in quarantine for 14 days, and isolation in hospitals, for those testing positive.

Government of Nepal has given top priority to COVID-19 control and prevention, currently using laboratory testing and surveillance, quarantine, isolation and providing personal protective materials to health workers including other essential health equipment and logistics which have been increased significantly. It is to be noted that 41,706 were discharged from the hospital which comes to 71.5 per cent of the total positive cases and the mortality rate has been 0.64 per cent. This is an example of significant improvement in clinical management of the hospitals in Nepal.

In the initial first three months, the situation was in control with the very few number of corona infected person. Since the Government has increased the coverage of RT-PCR test, the number of the COVID-19 infected person reported has increased significantly from 14 January 2020, to the present level of more than 1,500 COVID-19 positive cases everyday. Some of the municipality areas close to Bihar and UP border were identified as hotspots because of the open border with India. Kathmandu valley with more 600 infected people per day, became the hotspot of COVID-19 pandemic covering about 50 per cent of the national data.

To address these situations, the following efforts have been made by State and Non-State sector.

State Initiative

i. Major entry point of India and China were closed, but due to the pressure of inflow of migrant workers from India recorded as far more than 45,000; the Government has arranged health desks in all entry points with the quarantine centres at national, provincial and local government levels. To manage these alarming situations, 1,077 Contract Tracing Teams have been mobilised.

ii. Necessary technical persons with equipment have been managed to upgrade the capacity of National Public Health Laboratory to test suspected cases of COVID-19 infection. Later, new RT-PCR testing for coronavirus was installed in national hospital hospitals outside Kathmandu valley, in all 7 provincial hospitals and some district hospitals. RT-PCR testing laboratories have been established in private sector as well and now the number of RT-PCR testing facilities for coronavirus infection have reached to 40.

iii. Identified Sukra Raj Infectious and Tropical Disease Hospital, Teku as COVID-19 treatment centre and later Armed Police Hospital and Patan Hospital as level-3 treatment centres. The State is continuing to expand new COVID-19 treatment centres. Provincial governments also prepared COVID-19 treatment centres. More beds have been added for patients with life threatening symptoms, needing intensive care treatment.

iv. The technical team developed "Health Sector Emergency Response Plan: COVID-19 Pandemic" which was in turn approved by the Government. This has given the road map to this emergency response.

A. Organisational Management

i. Inter-sectoral Coordination Committee was formed at the national level under the chair of Deputy Prime Minister and Defence Minister, to coordinate the activities of home, finance, civil aviation, immigration, supply and other ministers. Inter-sectoral coordination mechanism was formed under the leadership of the Chief Minister, at Provincial level and coordination mechanism was made in place at district level and municipality level.

COVID-19 Situation in Nepal

1. RT-PCR Tests: 914,290
2. Positive Cases: 64,122
3. Isolation: 17,478
4. Quarantine: 745
5. Cured: 4,233
6. Cured percentage: 72.1%
7. Deaths: 411
8. Death percentage: 0.64%

Data as of 20 September 2020

ii. International borders were closed and lockdown was declared at both air and surface level crossings. Offices and services with non-essential functions both at Government and non-government levels were closed.

B. Relaxation in Lockdown

In view of the economy of the country, and also the pressure from the small enterprises including petty traders and daily wage labourers, from September 2020, the Government relaxed the lockdown. This permitted to open shops, small entrepreneurs, public transportation including long route buses, domestic flights and selected International flight with strict safety measures. However, the Government continued to ban organising seminars, workshops, parties including big gathering with more than 25 persons. The Government did not permit opening bars, beauty parlours, fitness centres, sauna; where movement would be high.

C. Policies and Treatment Guidelines

i. Declared National Public Health Emergency from 24 March 2020 with lockdown in all offices and domestic transport.

ii. Developed and approved different standards related to infection prevention.

iii. Use of convalescent plasma therapy and Remdicivir, an anti-viral drug for severe COVID-19 infections treatment have been started.

iv. Developed norms for reporting of COVID-19 deaths.

D. Media Briefing

Everyday from 4:15 - 4:30 PM, the Government carries a televised broadcast and "Media Briefing" on the daily situation of the pandemic. This includes national, provincial and district level data on total RT-PCR tests, total infected persons, total in isolation, in quarantine and also the number of patient in ICU and ventilator. The media briefing also gives the number of patient discharged in the last 24 hours. The Ministry of Health and Population express condolence to each person whose family member may have died of COVID-19.

At the societal level, the senior citizens have experienced traumatic situation and panic at the thought of the COVID-19 pandemic. Most of the rural children have been deprived of online classes. The daily labourers are in the state of "no-work, no pay".
People are starving. There is significant increase in suicide rate. In addition, sexual violence including rape cases have increased during the quarantine period.

Keeping into account the above situation, regular media briefings, counselling from the sociologist, paediatric specialist, psychiatrists, ayurveda, naturopathy and yoga specialist; are ongoing, helping people to manage the pandemic situation.

E. Public Awareness

Print and electronic media play a very active and effective role in making the public aware on COVID-19. All the TV, Community Radio, newspaper and online media have been playing a very active role in making the "Public" aware of safety measures. Some TV channels also telecast educational dramas. These messages

Photo Source:-BikramRai

are simple and easy to understand. In addition, Nepal Telecommunication Authority, being the largest company in terms of National coverage, sends out COVID-19 Safety messages, instead of just the regular ring tone of both mobile and telephone network.

Civil Society Initiative

i. In order to compliment government effort, the civil society is also playing a very active role in making the public aware. In this context, the virtual meeting organised by People's Health Movement and by RECPHEC on the role of Ayurveda and Indigenous medicine, in addressing COVID-19 pandemic, is worth mentioning here. Besides, RECPHEC produced wall-posters and pamphlets with simple message on proper use of mask, washing hands/sanitiser, and maintaining social distancing, these communication material have been widely distributed by District Police and Municipality office.

ii. Initially, most of the ambulance drivers hesitated to take COVID-19 infected patients to the hospital. They panicked at the idea. Hence, some youth came forward to pitch in by providing Ambulance Service with all safety measures. Now the situation has normalised for the better, and the ambulance drivers are available day and night, to serve the COVID-19 patients, while wearing PPEs and abiding by other safety measures.

iii. The youth have also come forward with car services free of cost for needy people to be taken for hospital services. These services are ongoing.

Protest For Better Testing For Corona Virus Disease

iv. In order to draw attention of the Government and to get them to initiate the RT-PCR test, the youth launched **"Enough is Enough"** campaign. With maximum access and usage of social media, the responses received were very good. These youth groups also staged a "sit in" campaign in front of the Prime Minister's residence.

v. With spike in hunger situation of daily wage labourers and their families, some NGOs started "Feeding Centres" which are still continuing.

vi. Some youth groups also initiated new campaign saying *"hune le dine, nahune le laijanun"* that translates to: **"***Donate if you have, Take back if you don't.***"** People have donated rice, daal, oil, sugar, salt at maximum level voluntarily, while the youth make family packs of these daily ration needs and distribute them.

Conclusion

More than 6 months of lockdown has badly affected the national economy. In addition to the daily wage labourers; small and petty business communities are having problem of survival, because of the absence of daily needs. In addition, the trauma created by COVID-19 has resulted into different psychological problems. Further, the senior citizens and others with chronic health problem like heart disease, sugar, kidney are not getting regular checkups, including dialysis facility. Hence, there is big question on "Public Health Services" of the State. The maternal mortality has tremendously increased in the last 6 months, due to unavailability of services in the hospital.

It is a well accepted fact that we have to live with this virus. The second waves of COVID-19 in European countries have once again threatened the whole world. But there is a hope from the various vaccines under development in Russia, U.K, USA, India and other countries.

The pandemic has given a message to the world, that we should not further exploit nature in the name of "Development". We have to live with nature. Let the future generation internalise this life saving message.

Management of COVID-19 in Sri Lanka

Background

The first case of COVID-19 in Sri Lanka was reported on 27 January 2020, when a female Chinese tourist quarantined at the National Institute of Infectious Disease (NIID), tested positive for the infection. The first Sri Lankan to be tested positive for COVID-19 was a 52-year-old tour guide, on 11 March 2020. After an effective control of the first wave of the epidemic, which was confined largely to a few clusters, Sri Lanka entered into a new phase with a rapid increase in the incidence of COVID-19 cases during the first week of October 2020.

As of 31 October 2020, Sri Lanka has a total of 10,663 COVID-19 infected patients, of which 6,264 are under medical care, 4,399 have recovered and 20 have deceased. The state authorities have taken proactive measures to contain the spread of the virus. Due to a multitude of coordinated actions by the Government of Sri Lanka, the first wave was effectively controlled, without reaching the stage of community transmission. This paper discusses the status of COVID-19 pandemic in Sri Lanka, from a public health and civil society perspective.

Factors that Led to the Successful Control of COVID-19 in the First Phase

The following factors have led to the successful control of COVID-19 pandemic in Sri Lanka:

1. Well established Public Health System:

The pre-existing robust and universal health care system, which has an extensive outreach to all communities in Sri Lanka, in a generally equitable way, was key to the effective management of the COVID-19 pandemic in Sri Lanka. The Government allopathic health services encompass preventive, curative, rehabilitative and promotional health care services.

A strong public sector service provider network is distributed throughout the country with a high penetration level. Any category of public sector service provider is available for service in less than 4.8 km (average), from a person's residence. However, private sector health care is also thriving in Sri Lanka, mostly focusing on the curative healthcare service delivery and is concentrated in the urban settings. An effective and rapid response was possible due to the ability to mobilise the physical and human resources within this health care delivery structure.

2. Coordinated mechanism at the Centre:

In late January 2020, a 22 Member "National Action Committee to Prevent the Spread of Coronavirus in Sri Lanka" was appointed by the President of Sri Lanka. On 16 March 2020, the President established a "National Operations Centre for Prevention of COVID-19 Outbreak" with the Army Commander as the Head of the organisation. Another Presidential Task Force was appointed on the 26 March 2020 to direct, coordinate, and monitor the delivery of continuous services, for the sustenance of overall community life. This included the direct supply of food provisions produced in rural areas to consumers, giving priority to the more vulnerable Districts of Colombo, Kalutara, Gampaha, Puttlam, Jaffna, Mannar, Kilinochchi, Vavuniya and Mullaitivu. In April 2020, "Sri Lanka Preparedness & Response Plan

COVID-19" (SPRP) was released by the Ministry of Health, which recognised the role of CSOs in Risk Communication and Community Engagement (RCCE) component of the Plan.

Further, early on in the pandemic, the UN convened the Humanitarian Country Team (HCT) mechanism and invited key local and international CSOs to be a part. Different clusters were formed, and Sarvodaya was chosen to be a co-chair, along with the MoH in the Health Cluster chaired by the WHO Representative (WR) in Sri Lanka.

3. Screening and Quarantine measures at points of entry:

As early as middle of January 2020, screening measures were adopted at the main international airport, to detect any inbound or outbound passengers with fever and respiratory symptoms. From March first week, mandatory quarantine of two weeks was introduced, for all incoming passengers with the establishment of quarantine centres managed by the Army, and supervised by the health staff. This arrangement continued up until the end of October 2020, when the protocol was changed.

4. Disease surveillance, case detection and contact tracing:

Disease surveillance remained in the hands of the Epidemiology Unit, and was carried out through the Regional Epidemiologists, Medical Officers of Health (MOHs) and the Public Health Inspectors (who were the frontliners in direct contact with COVID-19 positive cases and their households). Military Intelligence was used in contact tracing, which continues to date.

Testing

Initially, Sri Lanka had limited testing capacity. However, the Ministry of Health was able to enhance the testing capacity within a short

COVID-19 Sri Lanka Total number of PCR Tests Performed as of 30 October 2020

(Source: https://bit.ly/32Yv6zu, accessed on 1 November 2020)

period of time. By October 2020, a daily average of over 8,000 PCR tests were being carried out. This growth can be traced in the graph shared above.

Treatment

Government took an early policy decision to hospitalise all COVID-19 positive individuals, even if they were asymptomatic, to facilitate monitoring and to prevent the spread of the disease to the community. All contacts were taken out of their homes, and were placed in government run Quarantine Centres. The National Institute of Infectious Diseases (NIID), the only specialised hospital in Sri Lanka for communicable diseases was designated as the main hospital for management of COVID-19 patients. As the patient numbers increased, MoH designated several other hospitals to accommodate COVID-19 suspected individuals. As of October 2020, there were 41 hospitals and treatment centres around the country, for COVID-19 patients.

Challenges Faced During the Lockdown Period

Starting 13 March 2020 until the end of May, the entire country was placed either under lockdown or curfew, creating mass panic among the community, which resulted in panic buying and a shortage of essential consumable items. Although the Government made arrangements with vendors to deliver essential items to households, many underprivileged communities were unable to access these services, facing a food crisis within their homes. These unprivileged communities also faced financial difficulties, as the bread-winners are mostly daily wage earners.

The Government came up with a cash grant scheme which did alleviate the suffering to some extent. With an increasing trend in the number of COVID-19 cases, the State is left with no choice but to continue with the imposed restrictions. This will lead to an economic downturn in the country, resulting in an increase in poverty, violence and social instability.

Further, it is crucial for the Government and humanitarian actors to develop and implement a gendered response to specific challenges faced by women, especially vulnerable groups such as female migrant workers, female headed households, and those in risk of facing domestic violence. An alarming concern in Sri Lanka has been the increase in violence against women, since the imposition of the curfew/lockdown. A chief

nurse at the National Hospital raised concerns about the increase in the number of women admitted to the accident ward, for domestic violence related injuries. Similarly, local women's organizations have experienced a significant increase in phone calls, received to their hotlines. The lockdown also means that many women are unable to use external means of communication, such as using a neighbour's telephone to ask for help when experiencing violence. Simultaneously, the National Child Protection Authority (NCPA) has also reported an increase in the proportion of child cruelty by 30 per cent, during the same period.

Many migrant women workers, such as those working in the Katunayake Free Trade Zone (FTZ) in the Western Province, did not receive their salary. As a result, they could not purchase essential items, and were unable to return to their villages, before the curfew was imposed. Many workers were made to work till the last hour in the factories, and most of them were unable to withdraw the salary advance deposited to their bank accounts. These challenges were addressed by the Government's COVID-19 response strategy, much later.

Civil Society Response

Initially, none of the decision making bodies established by Government of Sri Lanka included any civil society, non-governmental or humanitarian organisation, although they had been in the forefront of emergency response in previous national disasters. However, by the second week into the lockdown, Presidential Task Force requested the support of the CSOs to help coordinate and provide assistance to care homes around the country. Civil society

actors in all 25 districts worked with relevant Government officials, to address the urgent food security, hygiene and medical needs of identified vulnerable groups. These included children's homes, elders' homes, centres for people with special needs, safe houses for women, rehabilitation centres and probation centres.

The civil society actors involved in the response voluntarily organised themselves district wise, and established contact with the relevant centres, and corresponding government officials. A virtual office was set up at the national level to coordinate the response, and a core group constituted to support the two national level representatives. The district representatives first utilised local resources available in the district from various actors and when needed, reached out for support from national level organisations.

By the end of June 2020, the CSOs had provided assistance to approximately 525 centres, and 15,600 individuals, across all 25 districts at the cost of about 50 million rupees. Assistance provided to these centres was two-fold- emergency relief and restoration of service gaps which included facilitating doctors' visits, health and psycho-social well-being, etc. The district representatives in a number of instances also facilitated transport, and other logistics arrangements, in order to ensure that these centres get what was needed on time. Emergency relief was provided to cover food rations as well as hygiene and sanitation items.

When engaging with these institutions, the civil society actors holistically looked into both physical and psycho-social well-being. This was implemented as a time

bound emergency assistance initiative in a decentralised structure, in which responding to needs was prioritized. It was executed within existing local government and CSO structures, and where necessary, through provincial as well as Central Governments along with CSO networks.

The relief assistance was coordinated by a group of 25 district coordinators, selected through a rapid open selection process among civil society networks and NGOs. These district coordinators, under the direction of their respective District Secretariats, coordinated with relevant Government officers in districts, and worked alongside social services, probation, elder's rights promotion, and women development officers.

Addressing Stigma and Discrimination

An important aspect of COVID-19 prevention work was the mobilisation of faith communities, to collectively prevent and mitigate the unprecedented challenges of the COVID-19 pandemic. Although, Sri Lanka had previously experienced devastating crises, the country has never experienced a pandemic before, therefore, most communities have been in an emotionally fragile state. Past experience has proved that faith plays a critical role in such situations in strengthening resilience; and religious leaders can positively influence millions of followers including women, children and vulnerable communities. On the other hand, communities also need to be prepared to adapt to new lifestyle, and use innovative approaches to achieve economic sustainability in the aftermath of COVID-19.

In order to mobilise religious leaders to play a transformative role in the context of COVID-19, it is important for religious leaders to increase their knowledge and capacity to respond during and after the pandemic. The current pandemic poses unique challenges, due to the requirement of physical distancing. Therefore, religious leaders, along with community leaders need to be capacitated to use innovative strategies, especially via ICT, to mobilise communities in preventing and mitigating COVID-19, and in adapting to the "new normal", during the aftermath of the pandemic. With the necessary capacity and tools, religious leaders and community leaders can play a key role in awareness raising, COVID-19 risk education, information sharing, peace building, and social transformation.

Current Status

After seemingly effective initial control of COVID-19 in Sri Lanka, and limiting it to "Cluster Transmission", Sri Lanka is facing a rapid second wave of the the pandemic with hundreds of new cases being reported every day. The Government Health Officers Association (GMOA) has identified a number of key issues in combating COVID-19 in Sri Lanka, as of October 2020.

The increasing number of COVID-19 positive individuals is resulting into a rapid inadequacy of bed capacity and necessary resources for management of other disease conditions. Further, the proportion of COVID-19 exposed health staff who are themselves converting into positive cases is on the rise, straining the human resource capacity and debilitating the health sector.

The number of individuals being quarantined through contact tracing are increasing exponentially; thereby reducing the capacity at available quarantine facilities. The

quarantine facilities are also facing human resource and logistical difficulties due to the increasing numbers of quarantined persons. Armed forces are getting exhausted due to continued and increasing work load. Human rights and legal concerns also arise as armed forces are engaged in the quarantine process. Further, as quarantine centres are occupied by contacts of postive cases; the probability of mixing of those who may and may not be positive is also there. This can result in cross infections due to unnecessary exposure at the centres itself.

The general population who are quarantined do not have a designated quarantine centre, depending on the area of residence. Therefore, individuals may be quarantined at varied centres, away from their residence. This has resulted in families and children being dispersed. Above all, quarantine mechanism has resulted in stigmatisation of contacts; therefore, those having a possible exposure; are now reluctant to step forward.

Higher number of staff involved in the service delivery is under the risk of exposure to the virus. Psychological trauma exists, especially among children along with disruption of education. Other important activities have been affected significantly. Many Government officials are attending to the management

From a civil society perspective, the following issues related to COVID-19 prevention and control have been identified:

PREVENTION OF

COVID-19

Low-level of active engagement of communities, community based organisations (CBOs), and civil society in the current national response.

Risk communication is "one-way" and is not reaching some communities (urban, estate and others), and not targeted to urgent needs in the transition in the exit strategy (i.e. Livelihood/Workplace specific public health guidelines).

Social stigma and discrimination (and even criminalisation) of COVID-19 positive individuals and patients, and their families, and even their communities and workplaces.

Changed context in the health services provision; not withstanding exemplary commitment by health staff, serious concerns regarding practices/attitudes which are unscientific and at times, and not in line with medical ethics.

Gender issues and challenges faced by women, including their participation in decision making processes.

of the pandemic, and as a result, many institutions are under performing with long and short-term consequences. Social and economic consequences are emerging, affecting industries and businesses at all levels as well as livelihood of citizens.

During the current pandemic, Sri Lanka has also been witnessing the impact of misinformation and disinformation on the infected people, their family and networks, as well as on ethnic, religious and social status they represent. This had even gone to the extent of naming and branding certain clusters based on social factors and economic status. Social media and mass media have been further propagating this kind of information, hence, further discriminating those already made vulnerable. Further, while generating testing and confirmed information is quite the responsibility of the health authorities, the public most often turn to the nearest information, which are at most times, unreliable and unsourced. Therefore, making the right information available and accessible to a majority is equally important as information itself.

Way Forward

In the wake of the second wave of infections in Sri Lanka, it is of paramount importance to find effective ways of interrupting the chain of transmission, as lockdowns are not feasible in the long term as the mainstay of COVID-19 control. One important strategy would be to enhance community engagement.

Civil society organisations, led by the Sarvodaya Shramadana Movement of Sri Lanka,[8] are currently involved in a strategic response. Sarvodaya aims to take on **two strategic approaches**, one at the community level, and another at the central level

knowledge management. The basis for both approaches and subsequent interventions will come from developing a knowledgable and a resilient community work force, health workers, volunteers at the community on health aspects, as well as managing misinformation and disinformation, and also one that extends to a resilient community, as the very core of the project. The project will also aim at designing resilient as well as accessible time and technology-based information platforms as a national repository that not only cater to COVID-19, but for any future pandemic situation.

COVID-19 Ready Villages: It refers to a village that is ready, and has found solution through collective action to problems occurred, relating to well-being and specially health, and one that improves the quality of life. It will have elements and effects of being replicated outside of the COVID-19 pandemic too, towards creating a "village of wellbeing". This will address some of the underlying issues faced by the local communities such as low level of action, knowledge and awareness; limited access to technology; access to information and services; food security; and availability of resources that are critical to face an unforeseen pandemic with minimum distractions.

The proposed model aspires to have the following key elements:

- Resilient and knowledge-based Community Health Champions, on aspects of health and well-being, towards improving quality of life through evidence-based community owned interventions.

- Access to and availability of right information and knowledge, on the pandemics, specifically on COVID-19.

- Action groups and champions at the community level that advocate for prevention measures, remedial action (based on health directives), and promote social cohesion and harmony.

- Ensuring safety and the well-being of the most vulnerable groups in the community.

- Use of innovative technological tools and platforms that are most suitable and effective for better community engagements, exchange of knowledge and information on the pandemic, and reduce negative health effects as well as stigma due to misinformation and disinformation.

Centralised Repository of Knowledge and Information: Sarvodaya proposes to address the gaps as well as streamline the channels of information, awareness and knowledge on the pandemic, based on a broader infodemic management framework.

It would provide the communities with opportunity, capacity, and leadership to be better prepared not only during the current COVID-19 pandemic, but also in the future for unforeseen pandemics and disasters. It will also give direction to a national engagement and a central knowledge management platform, that transcends knowledge to application.

Knowledge about the various aspects of the COVID-19 must be public, so that their sharing should be facilitated and accelerated. Knowledge creation and knowledge transfer need a collaborative

work, in order to translate into action and promptly inform decision-makers. Thus, the aim of this initiative is to build a centralised knowledge platform, that serves as a national knowledge base on COVID-19 health concerns, preventive measures and action, accurate information of the context and the pandemic, adopting to a new living order, managing misinformation and disinformation, promoting inclusiveness, and social harmony.

To conclude, COVID-19 is not the beginning nor the end, and there may be so many different health and social challenges against which countries will need to be prepared. Therefore, it is of importance that we have the right repository of information, guidelines, best practices and lessons learnt in different communication forms such as audio, video, print, and verbal means. Most important is the continuation of a national dialogue engaging a diverse and critical line up of stakeholders, who will continue to be advocates of building responsive and resilient practitioners as well as decision makers.

While the Sri Lanka Government takes the core of responsibility and action on the COVID-19 response and management, there are many structures, platforms and decision makers that are necessary to win the battle against COVID-19. A complete society and integrated approach which involves communities and professionals, addressing health, social, economic and political dimensions is the way forward to beat the pandemic.

Responding to the Coronavirus in the United Kingdom: In Search of the Goldilocks Solution

Introduction

The United Kingdom has so far experienced one of the worst mortality outcomes from the Coronavirus pandemic, certainly in Europe, and alongside suffering some of the most serious economic consequences. An analysis of the UK's response is helpful therefore, in understanding how to tackle further waves of transmission and indeed future pandemics.

There had been 361,508 confirmed cases of COVID-19 in the UK as of 14 September 2020 and 41,628 attributable deaths, which amounts to the fourth highest mortality rate in Europe (Johns Hopkins University). The vast majority of those who died had underlying health conditions, such as diabetes or obesity, or were immune-compromised often because of treatment for cancers, or other conditions. COVID-19 was mentioned even more frequently as an associated factor in additional death certification with almost 58,000 certificates citing it as a factor (ONS: Deaths registered in England and Wales between 13 March and 25 September 2020). Most deaths were in those aged 60 years or older with over 90 per cent occurring in this group. Many of those under 30 years of age were less affected, or indeed asymptomatic.

The severity of symptoms has been strongly correlated with increasing age, as well as ethnicity and economic status. More recently, other factors have been potentially associated with the severity of the disease, such as levels of Vitamin D.

Any review of a country's response to the Coronavirus (COVID-19) must start with a recognition that this virus is new to humankind. It is not called a 'novel' Coronavirus without reason. Not only does the virus behave in a manner uncharacteristic of most other viruses in general, but more specifically other Corona viruses. Given that COVID-19 arose in the human population as a result of a species jump, people have no experience of this virus and those exposed have no resistance, or immunity conveyed by previous infection. Moreover, we have limited knowledge as to how populations respond behaviourally to an unfamiliar communicable disease, and to the social controls imposed by their governments. The economic costs have also taken many politicians by surprise, even though the public health community has been warning of these issues for decades.

The Idiosyncrasies of the UK Political System

In addition to England, the UK includes Scotland, Wales and Northern Ireland with each having its own devolved Government, and associated Parliament or Assembly. Each has a Department of Health, local Ministers, and a Chief Medical Officer(CMO). These are in addition to the UK Government and Westminster Parliament, which also fulfils the administrative role for England. Scotland, Wales and Northern Ireland have their own characteristics, culture, and some differences in systems and infrastructure. It is conceivable

that this may even extend to social compliance with Government recommendations, although there is no evidence to confirm this. Although all are a part of the UK National Health Service (NHS), each country has management responsibility for its own hospitals and health and social care system. Public health is also a devolved function. Each of the four nations assumed responsibility for COVID-19 interventions, resulting in some differences of both actions and timing. It would be fair to say that there were some variations in interpreting the evidence as well. The clarity of communication also varied from country to country, with Scotland perceived by both public and media as having performed relatively well in this regard.

The population of the UK in mid-2019 comprised some 66.8 million people (*ONS Statistical Bulletin, Population Estimates, June 2020*). Of these, 5.45 million were Scottish residents (8.16%), 3.15 million were Welsh (4.72%), and 1.9 million Northern Irish (2.84%).

The UK Westminster Government was advised from the outset by a specialist Scientific Advisory Group for Emergencies (SAGE), comprising experts in the relevant sciences. This group included leading figures from public health, epidemiology, virology, the economic and statistical disciplines, along with the behavioural sciences. Somewhat controversially, Government political advisers also contributed to the meetings, resulting in suggestions that they might have been attempting to influence conclusions and recommendations, although the scientists would argue that they were fiercely independent. Scotland, Wales and Northern Ireland supplemented the SAGE advice with their own, not least offered by each nation's CMO.

The Relationship Between Scientific Advice and Policy

It is an established principle in the UK that advisers 'advise' and politicians 'decide'. Indeed, the terms of reference for SAGE clearly state that the Government does not have to act upon the expert analysis proffered. SAGE conclusions do not represent official Government policy. This is note worthy, as politicians have frequently stated during the COVID-19 crisis that they were following scientific advice and, in the process, inferred that perhaps they did not bear full responsibility for the consequences of decisions taken. The basis for Government decisions was further confused by virtue of the fact that SAGE minutes were not published until 29 May 2020 even though SAGE first met some four months earlier. Even when made public, the minutes were no more than an outline summary, and it is not clear to what extent they had been subject to editing. This was of such concern to many scientists external to the SAGE process that a Shadow SAGE was set up on 4 May 2020. Meeting under the Chairmanship of a distinguished former national Chief Scientific Adviser, Sir David King, the intention was to open the debate for public and scientific scrutiny.

At its launch, King stated *"We don't know what advice is coming from the scientists on SAGE into the Government. There is no transparency in the process. When Ministers say they are simply following scientific advice, we, the public, don't have any check on that."* The establishment of Shadow SAGE in early May 2020 probably encouraged the Government to publish for the first time the summary notes of Official SAGE meetings, later that month.

The early SAGE meetings in January and February 2020 focused on trying to understand the virus, its characteristics and its epidemiology, not least how to slow community transmission in the UK. It was clear that in January, SAGE had had not yet received much by way of meaningful information from Wuhan in China. At its second meeting on 28 January 2020, SAGE concluded that there was some limited evidence to suggest the possibility of asymptomatic transmission, although this could not be confirmed, or quantified at this stage.

Notably, SAGE confirmed the importance of behavioural science evidence, in underpinning policy and the need for the Government to secure public trust. This was viewed as being essential in securing public support and social compliance. Despite this assertion from SAGE, concerns were raised early on about the basis for Government decisions, bearing in mind that SAGE minutes did not become available until May 2020. Similar comments appeared elsewhere and, indeed, the BBC published an article on 16 March 2020 highlighting criticism of Downing Street for an apparent lack of transparency in drawing up the Government's plans (BBC News Website, 16 March 2020).

Such concerns may have been a consideration in ensuring that the CMO and Chief Scientific Adviser appeared alongside the Prime Minister, at Ministerial TV briefings from the middle of March, presumably to add scientific credibility and authority to Coronavirus policy decisions. This joined-up approach, tying politicians and scientists together in the viewers' minds, may well have encouraged public trust in the early days. As the pandemic progressed into the summer, however, it may subsequently have undermined public confidence in the

year-old woman tested positive as early as 21 February 2020. She then died, some two days before the previously known domestic fatality. Even earlier deaths from COVID-19 then began to emerge. Further analysis showed that an 84 year-old man died in hospital on 30 January 2020 with what we now understand to be classic COVID-19 symptoms. He is reported as having fallen ill in December 2019, and interestingly had never travelled abroad, suggesting that the virus may already have been present in the community several months earlier, then had originally been surmised. Other evidence from the BBC in May 2020 supports this contention. Jane Hall, a member of two choirs in Yorkshire, reported COVID-19 like symptoms in both choirs in early January 2020. One of the first choir members to become ill was the partner of a man who had returned from a business trip to Wuhan in mid-December 2019. Jane and her colleagues described classic COVID-19 symptoms, including an additional symptom that emerged later as a diagnostic characteristic - an impaired sense of taste and smell. Public as well as professional awareness of Coronavirus at this stage was low and an understanding of its clinical presentation even lower. Although not confirmed as COVID-19, the symptoms and the link to Wuhan are highly suggestive that the virus was already circulating before the end of 2019.

Community transmission started to cause concern from early March 2020. Initial data on population infections lacked the precision of reported mortality data. The rising incidence was being measured through several mechanisms. Perhaps the largest study of symptoms used a downloadable application. Developed by Kings College London, the app enables people to report COVID-19 symptoms, to help track progression and identify the array of symptoms associated with COVID-19. For example, it was this research that helped to identify the association between the disease and delirium in older patients. 4.3 million people had downloaded the app by early October 2020.

The number of confirmed cases rose rapidly, more than doubling every week from 13 March 2020 to a peak towards at the end of April 2020 (*WHO, Coronavirus Disease [COVID-19] Dashboard*). The highest number of confirmed daily cases in this phase, 5,487, was on 24 April 2020. Plateauing during the first week of May 2020, it declined throughout June 2020 and eventually reaching a low in July 2020. The curve of infection started to rise again slowly from the second week of August 2020. The potential for a 'second wave' started to become apparent early in September. By 27 September 2020, the daily total had reached over 6,000 confirmed cases and by 10 October 2020, it was exceeding 13,000 a day, dramatically increasing throughout October. A direct comparison of the number of cases in April and October 2020 is not possible, as testing capacity had increased. Therefore, by definition, more cases would be detected. A better measure of the impact of COVID-19 can perhaps be seen from the mortality data.

There was a lag period of around two weeks between the rise in confirmed cases and COVID-19 deaths. The UK mortality during the initial outbreak reached a peak of 1,224 deaths on 22 April 2020, declining to single figures on some days during the summer. Daily mortality started to increase again and stood at some 70 to 80 as of 10 October 2020. (WHO Dashboard).

Clinical interventions have improved with the better understanding of COVID-19, and the

expectation was that the death rates would be lower than earlier in the year. That said, the daily increase in new cases by the end of October was well in excess of the worst case scenarios, leading to concerns once again that the NHS intensive care system would be overwhelmed with COVID-19 patients.

Actions and Interventions

Planning gathered pace during March 2020 as concern rose, culminating in a major lockdown in England on 23 March 2020. Scotland and Wales locked down various sectors a few days earlier. The strategic aim at this stage was clear, namely to avoid overwhelming the NHS with seriously ill COVID-19 patients, as had occurred in some other European countries, notably Spain and Italy. Lessons had been learned!

Politicians moved quickly to commission new COVID-19 dedicated hospitals, which became known as Nightingale Hospitals. Designed to meet London's needs, the epicentre for the initial outbreak, the first of these hospitals was commissioned in only eight days from start to finish. Constructed with military assistance, it had a potential capacity for 4,000 beds. Others Nightingale Hospitals followed across the UK. Additionally, most of the existing independent sector capacity was commissioned, predominantly to provide non-COVID-19 related care. Very little of this enhanced capacity was actually required, as COVID-19 cases were managed well within existing NHS hospitals.

Although every attempt was made to separate suspected COVID-19 cases from other patients, undoubtedly in-hospital transmission occurred. Two noticeable effects resulted. Firstly, many staff became infected,

their risk exacerbated by the lack of quality PPE (Personal Protective Equipment). Evidence suggests that the severity of the infection is at least to some extent dose dependent *(Pujadas, E. et al, 'SARS-COV-2, Viral load predicts COVID-19 mortality'. The Lancet, 6 August 2020)*, leaving doctors and nurses seriously exposed. Concern rose during the year as more NHS and social care frontline workers were thought to have died from COVID-19, resulting in the request for an investigation on 29 May 2020 by the Department for Health and Social Care *(Lintern, S., The Independent, 11 August 2020)*. Yet to be concluded at the time of writing, this will cover more than 620 frontline healthcare deaths, thought to have occurred since the beginning of March 2020.

Pressure on NHS beds also meant that some COVID-19 patients were discharged while still infectious, sometimes into care homes. For example, from 17 March to 15 April 2020, some 25,000 patients were discharged from hospitals into care homes *(National Audit Office Report. 'Readying the NHS and Adult Social care in England for COVID-19'. 12 June 2020)*. The number with COVID-19 is not known, as Government policy and a lack of testing capacity at the time meant that not all of them were tested.

On 15 April 2020, the DHSC initiated a new policy requiring all patients to be tested prior to discharge. However, until the change in policy hospitals became repositories for the community transmission of the disease, albeit unintentionally. Until 12 June 2020, nearly 30 per cent of all deaths among care home residents were related to COVID-19. Perhaps somewhat surprisingly, the Nightingale Centres were not used as dedicated COVID-19 centres, enabling them to be quarantined, thereby reducing the potential for cross infection with other patients.

Access to appropriate PPE proved problematic for both the NHS and care homes. Broadcast news programmes were filled with complaints daily about inadequate PPE supplies. When supplies did arrive at considerable cost to the public purse, they were not always of acceptable quality. This remained an issue throughout the peak period of infection, resulting in considerable criticism of the Government and senior NHS management. The care home sector in particular felt that it had been abandoned to the worst ravages of the virus.

PPE was one of several particularly contentious issues. Although the UK holds a central supply of PPE, this was designed for an influenza pandemic. Despite a recommendation to improve emergency stocks of PPE, the availability of gowns and visors fell well short of what was required to meet the demands of the COVID-19 pandemic. The reduced infection rates during the summer, allowed the UK to build up a significant stockpile.

Despite political, professional, and public complaints about the Government's approach, Ministers also received some plaudits, notably in housing the homeless. The UK has many homeless people, rough sleepers, and those of no fixed abode living in hostels, amounting to approximately 46,600 altogether. As New York showed only too well, the homeless are particularly vulnerable, experiencing a 61 per cent excess mortality compared to the rest of the population *(Routhier, G. and Nortz, S. COVID-19 and homelessness in New York City. Report by the Coalition for the Homeless. June 2020)*.

Just three days after the national lockdown in the UK, the Housing Ministry made 6 million pounds available to fund accommodation for all homeless people. A modelling study published by *The Lancet* estimates that 21,092 COVID-19 infections, 266 deaths, 1,164 hospital admissions and 338 ICU admissions were avoided as of 31 May 2020, as a direct consequence of this highly effective initiative *(Lewer, D. et al. 'COVID-19 among people experiencing homelessness in England: a modelling study'. Lancet Respiratory Medicine. 23 September 2020)*.

On the downside, the national Test and Trace arrangements have been severely criticised, despite the emphasis placed by both politicians as well as professionals on the importance of testing individuals with symptoms, and then rapidly tracing their contacts. Perhaps surprisingly, two commercial companies were commissioned to run the testing scheme instead of funding the public health system to do so. It is clear that despite the best of intentions, the Test and Trace system has seriously lagged behind need; both in terms of the availability of test and the speed with which results are frequently made available. The contact tracing arrangements have also been inadequate, and this continues to be the case as at the end of October 2020.

To reduce community transmission and protect the NHS, Government announced a number of restrictions on public movement and travel as part of the 23 March 2020 'Lockdown'. Under the strapline '<u>Stay Home; Save Lives; Protect the NHS</u>', people were told they should only leave their homes for:
- Shopping for basic necessities and as infrequently as possible.
- One exercise session a day alone, or with members of the same household.
- Any medical need, or to provide care for someone in need.
- Essential travel to or from work, and only if work could not be done from home.

The above measures coincided with sector specific restrictions effective from 23 March 2020. These included:

- Closure of all schools, except for a limited number of special category children.
- Closure of non-essential shops.
- Closure of entertainment and hospitality venues, such as restaurants, gyms, cinemas, etc.

Other measures now regarded as important, such as masks, were not compulsory until 15 June 2020, and then only on public transport. Masks became mandatory in shops on 24 July 2020, long after the UK-wide lockdown had finished. Although people were advised to wear a face covering as early as 10 May 2020, it did not become a legal requirement until some six weeks later. SAGE had recommended the community use of cloth face masks for enclosed spaces as early as 21 April 2020.

Balancing Public Health and Economic Impact

Public health measures to reduce community transmission inevitably constrains economic activity. Economic decline in turn has a negative effect on health and wellbeing. Moreover, health is an economic good in the same way as capital or labour. Health and wealth are therefore indivisible. This presents an unenviable challenge for any political leadership.

Alongside the social, behavioural and organisational interventions designed to reduce COVID-19 transmission, Government introduced a package of economic support measures to mitigate the financial cost to both businesses and workers who had been laid off. There was widespread acknowledgement at the time that such actions were essential, although there was debate about the exact sums made available to different economic sectors. Workers laid off because of Government public health actions received subsidies through a scheme known as 'furloughing'. The total cost of the economic package at the end of lockdown was 123 billion pounds *(Office for Budgetary Responsibility. 'Coronavirus reference scenario monthly profiles. 14 May 2020)*. The Government's economic intervention was viewed largely as a positive initiative, focussed on keeping the economic infrastructure and employment alive; despite many commercial and industrial sectors lying dormant during the lockdown period.

The Government gradually released the national lockdown from 10 May 2020. At this stage infection rates had fallen to between 2,000 to 3,000 cases a day, and deaths to 275 – 450 (from a peak of 1,224). Exiting lockdown, described as the UK Recovery Strategy, fell into several stages.

- Those who could not work from home, and who had been laid off work, or furloughed were encouraged to return to work.

- From June, outdoor retail outlets (such as garden centres) could re-open.

- Primary schools should re-open, also from 1 June 2020.

- The non-essential retail sector could resume business from 15 June 2020, providing they met COVID-19 secure guidelines.

- From 4 July 2020, remaining businesses and premises would be allowed to reopen with the proviso that social distancing measures could be implemented effectively.

Although welcomed by business and commerce, numerous commentators suggested that the release from lockdown should have followed a more systematic, phased approach. For example, a more precise sector by sector plan, coupled with evaluation of the impact on disease rates, would have provided valuable evidence as to the most important conduits for community transmission, and allow more targeted interventions at a later stage.

Public Compliance

SAGE emphasised early in the pandemic that public trust in the Government was of paramount importance in ensuring public compliance. This is true both for the credibility of the message, as well as the messenger. Despite high levels of public compliance up to and including lockdown, public support waned in the aftermath of lockdown. There are several reported reasons for this.

The intervention approach after lockdown changed. New cases and deaths continued to drop throughout the British summer. Notwithstanding the overall reduction, local 'hotspots' arose in various parts of the country, mainly the northern England and South Wales. Local Councils were often adept in addressing outbreaks, and were better able to engage with local community leaders than national government. This led to increasing diversity in the measures adopted based on local circumstances.

On top of this, political opposition commented that the exit from lockdown lacked focus on a clear goal with no clear strategic framework, for managing the disease into the foreseeable future. Public messaging became less coherent and at times contradictory. High

profile Government leaders themselves did not always follow the rules and regulations established for the country as a whole, generating much media as well as public condemnation. The Prime Minister's Principal Adviser blatantly ignored travel restrictions, but did not appear to be held to account for his behaviour. Cabinet Ministers acted likewise. Lack of compliance by senior political figures was associated not only with considerable criticism of their behaviour, but also scepticism about the value of the public health measures themselves.

When the second wave arrived at the beginning of September, there was much more questioning by business, the media and the public of the Government's approach. The Government's 'Second Wave' strategy was focused on local areas with increasing COVID-19 cases, utilising a tiered regime of interventions.

Lessons for the Future

Managing the Coronavirus is undoubtedly a work in progress! This is a novel human virus and we have much to learn about how best to control its spread, as well as to manage its impact on human health. The virus does not respect the artificial geographical borders laid down by nations. Interventions are by definition complex both to plan and deliver, crossing the boundaries of epidemiology, virology, medicine, behavioural science, and economics. Political science must be aligned with social psychology, and delivered through complex systems change as well as organisational development.

The UK analysis certainly does not deliver all the answers, but there may be a few lessons to be learned from the British experience.

What works

- A clear, unambiguous objective is essential (e.g. Save the NHS from becoming overloaded).

- Clarity of public communication, not least in relation to the constraints and social behaviours expected of people, as well as the sanctions to be applied if necessary.

- Economic support for those asked to make sacrifices, in the interests of population health is necessary.

- Public compliance with social and behavioural measures depends on the credibility of the message, along with the political leadership.

- Scientific analysis and recommendations must be free from political pressure.

- Professional advice must be clear and placed in the public domain.

- Early and timely intervention is essential; prevarication and delay cause unnecessary spread, deaths along with potentially additional costs.

- Too early an exit from public health controls can lead to a resurgence in community transmission.

- An effective Test and Trace system is essential to target as well as control outbreaks.

- While some measures require national intervention, such as economic support, local government and the public health system can be better at tracking community transmission as well as stimulating local public support.

- Identifying the true incidence as well as prevalence of the disease, and its distribution are essential for effective management.

What requires further development, consideration or research

- The balance between economic activity and public health action.

- How to encourage social compliance with disease control measures.

- How best to maximise the testing of those with COVID-19 like symptoms and tracing their contacts.

- The role of the media in aiding understanding, encouraging compliance, and presenting an objective and unbiased view of public opinion.

- How to balance population needs with individual liberties.

- How best to ensure the independence of advice, and how this is perceived by the public.

- What financial and support measures are needed to help those with symptoms (or who test positive for the virus) to self-isolate in the interests of the wider community.

- How best to manage the return to 'normality' and exit from 'lockdown'.

What to avoid

- Multiple messages, or constantly changing rules cause misunderstanding and confused compliance.

- Lack of a clear overarching objective reduces compliance.

- Political leaders must be seen to follow the rules rigorously.

- Population groups or economic sectors known to be vectors (e.g. young adults or food processing factories) for community transmission; must be identified, isolated and supported without delay.

- Failure to make behavioural compliance (e.g. social distancing; public gatherings, etc) compulsory encourages a minority to act selfishly.

Necessity is the mother of invention, and there is little doubt that humankind will find ways in due course of time in managing the Coronavirus. But the question must be asked: Why have we seen the emergence of several new human viral infections in recent decades? What are the precursors and catalysts?

There is good evidence to suggest that the more humankind stresses the global environment, the more likely it is that we shall see further pandemics over the coming years, which may well be ever more severe in their impact. What if a highly communicable disease such as COVID-19 had similar infectivity, but coupled with a much higher mortality rate?

Photocredit- Joe Giddens_
PA images via Getty images

Captain Tom Moore, 99, at his home in Marston Moretaine, Bedfordshire, after achieving his goal of 100 laps of his garden. His efforts help to raise nearly £33m for the NHS.

Role of International Organisations During COVID-19 Pandemic

Overview

The COVID-19 pandemic has presented a myriad of social, economic, political and strategic implications inflicting enormous challenges on individuals, societies and states. International organisations, owing to their history as well as contemporary roles, have vital undertakings in the global response. These organisations were created to strengthen global coordination and cooperation efforts and it has come to full display during the pandemic induced adversities posed upon the world. Various international organizations as per their mandates are coordinating global efforts such as airlifting material and medical staff, managing multinational research work, sharing essential information and initiating relief funds.

World Health Organisation (WHO) is the international body that advises the world on handling health crises. It is a specialised agency of the United Nations responsible for international public health. The present chapter chronologically traces the role and response of WHO in the COVID-19 crisis followed by a critical analysis.

Apart from WHO, other specialised agencies of UN, as well as non-UN organisations like European Union; have also been taking specific measures to tackle the impact of COVID-19. The chapter further briefs about the response of some of these specialised organisations to support countries, in facing the current medical and socio-economic crisis.

Role Of WHO During COVID-19 Crisis

On 5 January 2020, WHO notified the world about "pneumonia of unknown cause" from China, and subsequently followed up with investigating the disease. On 20 January 2020, WHO confirmed human-to-human transmission of the disease. On 30 January 2020, WHO declared the outbreak a Public Health Emergency of International Concern, and warned all countries to prepare.

On 11 March 2020, WHO said that the outbreak constituted a pandemic. WHO releases daily situation reports and holds press conferences for updating the media about the pandemic. By April 2020, WHO's Solidarity Response Fund had gathered more than US$140 million from more than 200,000 individuals and organisations. It has shipped more than two million items of personal protective equipment and one million diagnostic test kits to over 120 countries. It has also launched multilingual e-learning courses about various aspects of COVID-19, including for preparedness and response.

Global Outrage and Criticism

WHO has been seen in critical light, by various global forces since the outbreak of COVID-19. The major contention has been about WHO echoing China's messages, of which the most catastrophic has been WHO's back-to-back advisories against restricting international travel, even after confirming human-to-human transmission. In the months since, the global pandemic has killed more than 1,000,000 people and put much of the world under an unprecedented lockdown.

WHO's COVID-19 Travel Advice Chronology

WHO in general, has been averse to unnecessary travel restrictions arising out of health concerns. In order to keep travellers safe while keeping international travel unbarred, under the International Health Regulations (IHR 2005); Member States are requested to maintain public health measures and response capacity at designated airports, ports and ground crossings. In similar lines, as traced below, WHO consistently advocated against restricting international travel; even after confirming human-to-human transmission on 27 January 2020.

Impact and Aftermath of WHO's Travel Advisories

In January 2020, when Chinese authorities were downplaying the extent of the virus, doctors at the epicentre of the outbreak in Wuhan reportedly observed human-to-human transmission. However, the whistle blowers were silenced. The WHO, meanwhile, was broadcasting the information from the Chinese authorities.

On 20 January 2020, a Chinese official confirmed publicly for the first time that the virus could indeed spread among humans, and within days Wuhan waslocked down.

The WHO, however, took another week to declare the spread of the virus a global health emergency-during which time Dr. Tedros Adhanom Ghebreyesus, the WHO's director-general, visited China and praised the country's leadership for "setting a new standard for outbreak response."

Timeline of WHO's
COVID-19 Travel Advisories

WHO advice for international travel and trade in relation to the outbreak of pneumonia caused by a new coronavirus in China
- International traffic: no restrictions recommended.
- Advised against the application of any travel or trade restrictions on China

Updated WHO advice for international traffic in relation to the outbreak of the novel coronavirus 2019-nCoV
- Human-to-human transmission confirmed
- Advised against application of any restrictions of international traffic

10 January 2020

24 January 2020

27 January 2020

30 January 2020

Updated WHO advice for international traffic in relation to the outbreak of the novel coronavirus 2019-nCoV
- Travel-related cases linked to Wuhan City reported in several countries since last update
- Advised to implement measures to limit the risk of exportation or importation of the disease without unnecessary international traffic restrictions
- Advised against application of any international traffic restrictions

WHO declared the current outbreak of COVID-19 a public health emergency of international concern and issued Temporary Recommendations

Updated WHO advice for international traffic in relation to the outbreak of the novel coronavirus 2019-nCoV
- Travel-related cases linked to Wuhan City reported in several countries since last update.
- Advised to implement measures to limit the risk of exportation or importation of the disease without unnecessary international traffic restrictions.
- Advised against application of any international traffic restrictions

11 February 2020

29 February 2020

11 March 2020

Key considerations for repatriation and quarantine of travellers in relation to the outbreak of novel coronavirus 2019-nCoV
- Countries should be prepared for containment, including active surveillance, early detection, isolation and case management, contact tracing and prevention of onward spread of 2019-nCoV infection, and to share full data with WHO
- On travel measures that significantly interfere with international traffic for more than 24 hours: need to be short in duration, proportionate to the public health risks, and be reconsidered regularly as the situation evolves

Joint International Civil Aviation Organization (ICAO)-WHO Statement on COVID-19
Importance of following existing regulations and guidance, particularly related to the Convention on International Civil Aviation and the IHR 2005

World Health Organization

Another month and a half went by before the WHO called COVID-19 a pandemic, at which point the virus had killed more than 4,000 people, and had infected 118,000 people across nearly every continent. It should also be kept in perspective that on 26 January 2020, Wuhan's mayor had revealed that about 5 million residents had left the city before the travel ban came into force.

Further, it must be kept in mind that those lost early weeks, also coincided with the Chinese New Year, for which millions of people across the world travel to visit family and friends. Due to lack of restrictions on international travel as advised by the WHO, millions traveled all over China, and then to all over the world. U.S. Department of Commerce data revealed that about 381,000 passengers arrived to the US from China in January 2020 alone, by direct flights. Actual passenger counts for indirect fliers were not available. Health screening in the US began in mid-January 2020, but only for a number of travellers who had been in Wuhan, and only at the airports in Los Angeles, San Francisco and New York. By that time, as per a China based an aviation data company, about 4,000 people had already entered the United States directly from Wuhan.

On 31 January 2020, Donald Trump, President of the United States, issued an executive order effective from 2 February 2020 which barred the entry to the US, of those who had been in China in the last 14 days. It did not apply to US residents and family members, or spouses of US residents, or citizens. To this, Chinese foreign ministry spokesperson remarked that instead of offering assistance, the US actions "could only create and spread fear".

WHO too, responded similarly; on 4 February 2020, Dr. Tedros, Director-General of WHO, urged the countries against travel bans at a WHO briefing. He said, "We reiterate our call to all countries not to impose restrictions that unnecessarily interfere with international travel and trade. Such restrictions can have the effect of increasing fear and stigma, with little public health benefit. Where such measures have been implemented, we urge that they are short in duration, proportionate to the public health risks and are reconsidered regularly as the situation evolves."

In another WHO briefing a week later on 11 February 2020, Dr. Tedros urged world leaders to give priority to containing the virus: "To be honest, a virus is more powerful in creating political, economic and social upheaval than any terrorist attack. A virus can have more powerful consequences than any terrorist action, and that's true. If the world doesn't want to wake up and consider this enemy virus as Public Enemy Number 1, I don't think we will learn our lessons."

It must be noted that while the US blocked the entry from China, by the end of January 2020; President Trump continued to appreciate Chinese efforts towards containing the virus as late as 29 February 2020.

WHO Diplomacy: Increased Caution and Reduced Budget

In November 2002 as an unknown respiratory disease surfaced in China and rapidly spread to the other countries. WHO acted rather swiftly and aggressively under the leadership of Dr Gro Harlem Brundtland, the former Prime Minister of Norway. Quite remarkably, overcoming the pandemic was not achieved through vaccines or medicines, but via "non-pharmaceutical interventions". These included travel warnings; tracking,

testing and isolating cases; along with a humongous data collection operation across multiple countries.

For instance, WHO did not shy away from publicly urging China to not withhold information, and to allow WHO into China to support the country's intervention. Further, for the first time in history, WHO issued advice against travelling to affected areas, when SARS reached other countries, as far as Canada. This advisory was not backed by any formal power; and travel advisories were always dependent on decision making of member states. Subsequently, the disease mortality was less than 1,000 people globally, despite the virus reaching 26 countries. Thus, WHO's response to SARS is even today considered a significant success.

More than a decade later, the world found itself grappling with yet another pandemic of similar unknown origin, with similar delay of information sharing from the country of origin- coincidentally the same country; yet, the course of action by WHO has been quite benign from the beginning. This is somewhere rooted in the backlash received by WHO for its quick action during handling H1N1 influenza virus or "swine flu".

Identified first in Mexico in March 2009, the novel influenza virus was declared a pandemic by June 2009 by WHO, by then there were more than 28,000 cases, in 74 countries. By August 2010, the pandemic was declared over. However, the lower than expected death toll of 18,500 confirmed global deaths; brought WHO under criticism, especially considering the virus spread to more than 200 countries.
Since then, the organisation has been acting with greater caution, even as it is displayed through delay. Prior to COVID-19, this cautious strategy was observed in WHO's handling of 2013 Ebola outbreak in West Africa.

The organisation has also been at the receiving end of funding cuts, especially since the aftermath of Global Financial Crisis of 2008. The funding gap stood at nearly USD 300m in 2012. In the face of COVID-19, as USA pulled its funding plug, WHO noted a USD 900m funding gap as of May 2020.

International Health Regulations (IHR)

The International Health Regulations (IHR), first adopted by the World Health Assembly in 1969, and amended in 2005 after SARS; are a legally binding instrument of international law that aim for international collaboration "to prevent, protect against, control, and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks and that avoid unnecessary interference with international traffic and trade."

While the IHR regulations do not empower WHO with any power in case member states refuse to comply, WHO can derive some other extraordinary powers from IHR which were, however, not utilised in the early stages of the Corona virus outbreak in multiple ways.

First, IHR grants the power to WHO to act on non-state sources of information and question the member states, or countries on their decision-making to initiate timely warnings and actions. In fact the IHR authorises WHO to "name and shame" nations that do not comply with IHR's requirements to outbreak detection, trade and travel bans and enforcement of human rights efforts. However, the response of WHO as late

as of February 2020 through reports as well as Twitter posts, to a large extent reflected the Chinese data. For instance, in their February report on the mission to China, the WHO experts said that China had gained "invaluable time for the response" in an "all-of-government and all-of society approach" that has averted, or delayed hundreds of thousands of cases, protecting the global community and "creating a stronger first line of defence against international spread."

Second, IHR allows WHO to question a country on its decision making. However, WHO's response was supportive of the Chinese decision making. The impact was a delayed lockdown of the epicentre of Wuhan city, late by almost 2 months. Further, WHO viewed Taiwan as a highly infected province under one-China policy, when Taiwan was amongst the very few countries that were effectively containing the virus.

Lastly, WHO has the power to declare an outbreak as a public health emergency even without the host country's approval. This means WHO could have declared COVID-19 as a major risk, or an emergency causing event before Chinese New Year (25 January 2020) to alert the nations on time. However, that did not happen.

It was on 30 January 2020 that the WHO Director-General, a week after Wuhan had been placed under lockdown by Government authorities, following the advice of the Emergency Committee convened under the IHR; declared the novel Corona virus outbreak a public health emergency of international concern (PHEIC). In fact, as seen in the above travel advisory chronology table, WHO was advising against the trade and travel restrictions, as late as mid-February.

Role of WHO in COVID-19 Treatment and Vaccine Development

On 18 March 2020, WHO and partners launched the Solidarity trial, an international clinical trial aimed to generate rapid data from around the world, to find the most effective treatments for COVID-19. Unlike randomised clinical trials that normally take years to design and conduct, the Solidarity trial was designed to accelerate this process. Enrolling patients in one single randomised trial was to help facilitate the rapid worldwide comparison of unproven treatments. This arrangement was also to overcome the risk of multiple small trials, not generating the strong evidence needed to determine the relative effectiveness of potential treatments.

Coalition for Epidemic Preparedness Innovations (CEPI), Gavi and WHO have launched COVAX to "ensure equitable access to COVID-19 vaccines. and end the acute phase of the pandemic by the end of 2021." COVAX works by pooling financial resources to purchase vaccines at scale, sharing the risks associated with developing vaccines, and investing up-front in manufacturing; so that vaccines are ready to be distributed as soon as they are licensed.

The goal of COVAX is to deliver two billion doses of safe, effective vaccines that have passed regulatory approval and/or WHO pre-qualification by the end of 2021. These vaccines will be delivered equally to all participating countries, proportional to their populations, initially prioritising healthcare workers than expanding to cover 20 per cent of the population, of participating countries. Further doses will then be made available based on country need, vulnerability, and COVID-19 threat. The COVAX Facility will also

maintain a buffer of doses for emergency and humanitarian use, including dealing with severe outbreaks, before they spiral out of control. As of 15 July 2020, 75 countries have submitted expressions of interest to join COVAX.

WHO Advisories to Countries on COVID-19 Testing

While WHO consistently advocated increased testing for COVID-19 to the countries, it recommended against the use of rapid test kits for a long time. On 13 January 2020, WHO published the first protocol for a RT-PCR assay by a WHO partner laboratory, to diagnose the novel coronavirus. The interim guidance released by WHO, on 2 March 2020, for laboratory testing for COVID-19 in suspected human cases, continued to advise the use of molecular testing based RT-PCR method.

> WHO could have declared COVID-19 as a major risk, or an emergency causing event before Chinese New Year to alert the nations on time. However, that did not happen.

In an advisory released on 8 April 2020, WHO recommended the use of new point-of-care, immuno-diagnostic tests only in research settings. It categorically recommended against the use of antigen, as well as antibody detecting rapid diagnostic tests for patient care.

Most of the countries are depending on RT-PCR method of testing, which is the most accurate but is expensive and time consuming. While the organisation appreciated the efforts and innovations of the kit manufacturers, it did not make adequate efforts to certify sufficient number of kit manufacturers for rapid and RT-

PCR kits; to help countries in procuring them. As a result, each country underwent their own process of certification which further delayed the process.

WHO on Disease Burden Estimation for COVID-19

WHO has published some surveillance strategies and sero-epidemiological protocols for countries, as technical guidance. However, considering that COVID-19 outbreak has been declared a public health emergency of international concern (PHEIC), WHO should have ideally pressured countries to develop sero-surveillance capability and conduct regular surveys; to monitor the progression of the epidemic. The entire global response is dependent on the country wise reported cases; when in fact there is no estimate of total number of infections; a number that must be much higher than the reported cases.

WHO on Re-purposed Drugs

A number of drugs have been repurposed, or in the process mainly due the efforts of countries to find a cure for COVID-19. WHO should have taken the lead in quickly picking up candidate drugs; which could be put through clinical trials for use as repurposed drugs. However, its time consuming procedures have not helped to make life saving drugs available for moderate to serious cases, resulting in mortality which was easily avoidable.

Remdesivir, lopinavir/ritonavir combined, lopinavir/ritonavir combined with interferon-beta and hydroxychloroquine, or chloroquine were approved by Solidarity Trial for use. However, due to safety concerns and evidence of heart arrhythmias leading to higher death rates, the WHO suspended the hydroxychloroquine arm of the Solidarity trial in late May 2020. It was reinstated to be withdrawn again, when an interim analysis in June showed that hydroxychloroquine provided no benefit to hospitalised people severely infected with COVID-19.

On 4 July 2020, WHO announced that the hydroxychloroquine and lopinavir/ritonavir arms of the Solidarity trial were being discontinued. The decision was based on evidence from the Solidarity trial interim results, and from a review of the evidence from all trials presented at the 1-2 July 2020 WHO Summit on COVID-19 research and innovation.

Perspectives for WHO's Future

On paper, WHO's Health Emergencies Programme provides a number of services to countries, including assessment support of country, health emergency preparedness, and development of national plans to address critical capacity gaps. Also development of strategies and capacities to prevent and control high-threat infectious hazards; and monitoring of new and ongoing public health events to assess, communicate and recommend action for public health risks. However, the international organisation has responded with a seemingly delayed, risk averse course of action; while supporting the countries during the current COVID-19 crisis.

Unlike other international bodies, such as the World Trade Organisation, the WHO, which is a

specialised body of the UN, has no ability to bind or sanction its members. Its annual operating budget is a two billion dollars in 2019; which is split among an array of public health and research projects. The lack of legally binding agreement among the member countries has been accentuated by weak application of IHR by WHO. The inherent structural problems at the WHO make the organisation vulnerable, especially at a moment when China has invested considerable resources cultivating influence in various international organisations.

WHO has also been observed to be slow to adapt its public health guidance to the latest research inferences. In the effort to be cautious, while delivering technical guidance and advisories, it tends to deliver delayed course of action, often reflected at country level. WHO has defended itself with the argument that its advisories carry great weight, and they can not be revised on the basis of a couple of novel studies.

However, COVID-19 outbreak has shaken the world, majorly due to the lack of information about it. Everyday, some new development about the pandemic becomes available. In such a rapidly evolving situation, advisories as well as decision making require simultaneous upgradation as well. This is the area where WHO has displayed slow growth.

![UNHCR - The UN Refugee Agency logo]

United Nations High Commissioner For Refugees (UNCHR)

United Nations High Commissioner for Refugees (UNHCR), is working with the mandate to protect refugees, forcibly displaced communities and stateless people, and assist in their voluntary repatriation, local integration or resettlement to a third country. It is rapidly responding in 134 refugee-hosting countries that are reporting local transmission. UNHCR has called for an extra USD 490 million as part of the UN's revised USD 6.7 billion appeal for COVID-19.

In May 2020, UNHCR and WHO signed a new agreement to strengthen and advance public health services, for the millions of forcibly displaced people around the world. The organisation has also embarked in new cash-based interventions, in 40 countries and scaled up its existing cash assistance in 25 operations, to bridge the gap between the initial socio-economic impact of the pandemic, and the time it takes to install national and international safety nets.

Since the end of April 2020, UNHCR has delivered 1.8 million masks, 800,000 gloves, as well as personal protective equipment kits, hand sanitisers, gowns, goggles and thermometers to 12 UNHCR operations.

United Nations Educational, Scientific And Cultural Organisation (UNESCO)

UNESCO is a specialised body of UN that seeks to build a culture of peace and inclusive knowledge societies, through information and communication.

In the context of widespread school closures to slow the spread of COVID-19, UNESCO is working with Ministries of Education in affected countries; to ensure continued learning for all children and youth through alternative channels.

- **Global Education Coalition:** UNESCO has launched a global education coalition to support countries in scaling up their best distance learning practices as well as reaching children and youth who are most at risk. The coalition has been joined by multilateral organisations, private sector, philanthropic and non-profit organisations, as well as media outlets. The coalition aims to help countries in mobilising resources and implementing innovative and context-appropriate solutions to provide education remotely, leveraging hi-tech, low-tech and no-tech approaches, seek equitable solutions and universal access, ensure coordinated responses and avoid overlapping efforts and facilitate the return of students to school when they reopen to avoid an upsurge in dropout rates.

- **Technical assistance** to quickly prepare, and deploy inclusive distant learning solutions, utilising hi-tech, low-tech and no-tech approaches.

- **Webinars for Governments' education officials** and other stakeholders to share information about country level efforts, as well as to maintain the provision of inclusive education in different contexts.

- **Setting educational radios and televisions** to reach a greater number of learners, especially the most vulnerable. UNESCO, in partnership with the European Broadcasting Union (EBU), organises a series of introductory virtual workshops to reach French, English and Spanish speaking countries. The objectives of these workshops are to facilitate the sharing of knowledge on good practices, in the development of educational broadcasting and, in so doing, to strengthen collaboration between educational content developers and broadcasting specialists.

- **A selection of digital learning resources** that governments, schools, teachers, parents can use to open opportunities for learners unable to attend to school.

- **A repository of national learning platforms** designed to support the continuity of curriculum-based study.

- **Surveys to analyse the impact** of, and response to school closures.

- **Global monitoring of country-wide and localized school** closures, as well as the number of learners affected.

> In Bangladesh's Cox Bazar Rohingya refugee camps, women are serving as front-line workers by producing masks to fill a significant gap of personal protective equipment (PPE) in the market

UN Women

UN Women's response to COVID-19 is part of the broader UN-wide response. It includes policy advice and programmatic interventions. Throughout the world, UN Women's response focuses on five priorities:

1. Gender-based violence, including domestic violence, is mitigated and reduced

UN Women is monitoring and/or undertaking rapid assessments of violence against women and girls, as well as working for COVID-19 in many countries, including Bosnia and Herzegovina, Egypt, Fiji, Jordan, Lebanon, Libya, Malawi, Morocco, Palestine, South Africa, Tonga, Tunisia and Vanuatu. The Safe and Fair programme in Asia Pacific reports increased risk of sexual exploitation along with violence by police and armed guards at border controls, and heightened risk of psychological violence to women migrant workers who lost their jobs, and are no longer able to support their families. UN Women focuses on prevention of violence and access to essential services, such as health, justice and policing, social services, and helplines. Through effective coordination of these services, the organisation aims to provide support services to those who have experienced and/or witnessed violence.

In Asia and Pacific region, UN Women is collaborating with Twitter, to provide important information about helpline services for domestic violence survivors. When a Twitter user searches for terms associated with violence against women such as "abuse," "sexual assault," "domestic violence," etc, the top search result will be a notification in their language; "If you are experiencing violence, help is available," followed by a relevant hotline number and the Twitter handle of that service. Twitter, with support from UN Women, is launching the notification service in India, Thailand, Indonesia, Malaysia, Philippines, Singapore, South Korea and Vietnam; as part of Twitter's #ThereIsHelp notification initiative.

2. Social protection and economic stimulus packages serve women and girls

In the Arab States, Latin America and the Caribbean, UN Women is focusing on economic sectors impacted by COVID-19 that employ women, including tourism and hospitality. Through guidelines and capacity building on how to develop tools and plans, UN Women aims to mitigate the risks and impact of the outbreak in the informal sector.

In Bangladesh's Cox Bazar Rohingya refugee camps, UN Women with its partners started masks production by mobilising women previously trained in tailoring. COVID-19 has significantly increased the possibility of domestic violence in their households, often due to further restrictions in income generation. Despite this, Rohingya women are serving as front-line workers by producing masks to fill a significant gap of personal protective equipment (PPE) in the market.

Over 50,000 masks are being produced and the manufacturing is being managed by partners in UN Women's five multi-purpose Women's centres in the camps, engaging 163 Rohingya women and girls with 46 families run as single female headed households.

Five Priorities of UN Women's COVID-19 Response

- Gender-based violence, including domestic violence, is mitigated and reduced
- Social protection and economic stimulus packages serve women and girls
- People support and practise equal sharing of care work
- Women and girls lead to participate in COVID-19 response planning and decision-making
- Data and coordination mechanisms include gender perspectives

In South Africa, UN Women is offering a suite of virtual learning courses through online classrooms with partners such as, Google and MTN. This virtual set up is assisting 4,500 women-owned businesses to apply for, and access government stimulus funding.

UN Women is also mobilising cash, essential supplies and food to provide relief to those in need. In Senegal, it is purchasing rice from women producers, which the Government has distributed to vulnerable families who receive monthly cash transfers.

In Lebanon, it is utilising the cash-for work and job placement programmes to provide unconditional cash transfers. In Jordanian refugee camps, UN Women is working with the World Food Programme (WFP) to ensure direct-cash based interventions through blockchain technology and OneCard Platform.

One section which UN women should have addressed is female sex workers. Most of the FSWs lost their livelihoods during the Covid crisis, and governments in most of the countries have failed in providing social support benefits to them; driving them towards hunger and starvation.It happened to other vulnerable sections of population like transgenders, people who use drugs, TB patients, AIDS patients etc.

3. People support and practise equal sharing of care work

In Argentina, an online survey on care and remote work was developed jointly with the International Labour Organisation, to collect inputs for strategies and public policies. In Ecuador, in partnership with UNDP, cash transfers to women are implemented in a "cash for work" modality, using the social assistance

delivery database of the Ministry of Inclusion. Special subsidies to support women providing unpaid care services in response to COVID-19 in El Salvador are under development.

Changing social norms to support equal distribution of care responsibilities is urgent in the current stay-at-home context. The #HeForSheAtHome campaign seeks to inspire men and boys to help balance the burden of care in their households. UN Women Morocco, is working to encourage men and boys to share domestic and childcare work with women, including with children's education. UN Women Malawi is supporting awareness-raising and sensitisation of influencers, youth networks, along with faith-based and traditional leaders on COVID-19 to address cultural practices that might impact the spread of the disease. UN Women Lebanon will launch a joint awareness raising campaign with UNDP on social norms, sharing care work and stopping domestic violence. In Latin America, the Campaign Caring-ForWork in partnership with PAHO, WHO and ILO raises the visibility of women working in health along with other care tasks.

4. Women and girls lead to participate in COVID-19 response planning and decision-making

In Bangladesh, Camps-in-Charge Gender Officers are working in 12 camps focused on supporting COVID-19 preparedness and response activities; cyclone and monsoon preparedness; and gender-based violence and other protection issues. In Myanmar, UN Women is mobilising, empowering and equipping women-led organisations; especially Rohingya women-graduates from the Rakhine Gender Leadership Programme, to create community awareness and knowledge on prevention and response to COVID-19.

In Nepal, UN Women convened 17 leaders representing women's and marginalised groups' organisations and networks, including organisations of persons with disabilities, LGBTI organisations, and Dalit women organisations, across the seven provinces of Nepal. The aim was to identify emerging issues and jointly advocate to the Government as well as the Humanitarian Country Team.

5. Data and coordination mechanisms include gender perspectives

UN Women is providing direct technical support to governments and UN partners to make sure that national response strategies meet women's and girls' needs.
In Lebanon, UN Women works with WHO, to support the protection and gender-response of the national Government. Gender experts are deployed to support the Tunisian Government's response to COVID-19. In Timor-Leste, UN Women is providing technical assistance to line Ministries, to ensure the state of emergency declared incorporates gender and protection considerations.

In Vietnam, UN Women and UNICEF are supporting the Ministry of Labour, Invalids and Social Affairs; to develop codes of conduct and safeguarding measures for women and children, in quarantine centres set up as a result of the COVID-19 outbreak.

In Paraguay, the advisory services to the Ministry of Women are provided jointly between UNDP, UNICEF, UNFPA and UN Women. UN Women in Jordan has collaborated with the Jordanian National Commission for Women, to develop a guidance document on integrating gender into COVID-19 preparedness, planning and response.

United Nations Children's Fund (UNICEF)

The United Nations Children's Fund (UNICEF), is responsible for providing humanitarian and developmental aid to children worldwide. It is working to slow the spread of COVID-19 and minimise its impact on children worldwide; by delivering life-saving health supplies, building water and hygiene facilities as well as keeping girls and boys connected to education and protection. For instance, the organisation airlifted essential supplies including Personal Protective Equipment (PPE) items such as aprons, boots, face masks and gloves for frontline health workers to respond to COVID-19 in Yemen on 30 May 2020.

The organisation has multi-sectoral teams with experts in health, nutrition, water and sanitation, education, child protection, inclusive social policy, disaster risk reduction, communication for development, as well as external communications and advocacy. These are located in 13 field offices which cover over 100 districts, across 23 states.

UNICEF India's COVID-19 Response Plan focused on risk communication and community engagement; improving Infection and Prevention Control (IPC), alomg with providing critical medical care and water, sanitation and hygiene

In India, the UNICEF response plan has two major goals:

1 Minimizing the spread and impact of the outbreak on the population, with a focus on women and children

2 Ensuring that essential services for women and children are safely made accessible during and after the pandemic

(WASH) supplies. The Response Plan also supports the provision of continued access to essential health and nutrition services for women, children and vulnerable communities, including case management. It also focuses on data collection as well as social science research for public health decision making. Further, it supports access to continuous education, social protection, child protection as well as gender based violence (GBV) services and coordination, including technical support as well as operational costs. As per the Response Plan, the support is to be delivered as part of existing government initiatives.

Also, as a CSR initiative, UNICEF India announced its partnership with SAP India to provide career counselling to young people in the country, that will improve their employability skills in a COVID-19, and post COVID-19 era.

European Union

The European Union and its member states are taking resolute action to mitigate the socio-economic impact of the COVID-19 outbreak, and to sustain jobs. The EU is mobilising the available resources to help member states coordinate their national responses. This includes providing objective information about the spread of the virus, and effective efforts to contain it. EU leaders have agreed to coordinate the EU's response to COVID-19 in the following areas:

- Limiting the spread of the virus.

- Ensuring the provision of medical equipment: The EU is working together with its member states and industry, to ensure that adequate protective equipment and medical supplies are available across Europe. In this regard, the organisation has launched four joint public procurement procedures for face masks and other personal protective equipment since February 2020. The EU and member states have also set up a common European reserve of medical equipment known as the 'rescEU' stockpile, which gathers masks and ventilators.

- Boosting research for treatments and vaccines: The EU is fast-tracking and promoting research on COVID-19 by mobilising:

  - 140 million euros to develop vaccines, new treatments, diagnostic tests and medical systems to prevent the spread of the coronavirus and to save lives.

  - 72 million euros for therapeutics and

diagnostics via the Innovative Medicines Initiative (IMI), in addition to 45 million euros contributions of private partners.

- 122 million euros in an urgent call to strengthen capacity to manufacture and deploy solutions, and to improve understanding of the epidemic.

- 48.2 million euros which has already been granted to 18 projects and 140 research teams, via the EU's Horizon 2020 research programme.

- 314 million euros for SMEs and startups for innovative solutions to tackle the COVID-19 outbreak, via the European Innovation Council accelerator programme.

- Supporting jobs, businesses and the economy - The EU has put forward a package of 540 billion euros to support member states. The package consists of three immediate safety nets for workers, businesses and EU countries. The EU has taken swift action to redirect the following EU funds to help member states:

- 37 billion euros from structural funds to support EU countries, and their citizens in their fight against the outbreak.

- Up to 800 million euros through the EU Solidarity Fund, which has been amended to provide support to member states affected by public health crises, like the one caused by COVID-19.

- Additional 3.1 billion euros unlocked from the 2020 budget, to respond to the COVID-19 crisis.

The organisation is also working to counter disinformation, by working closely with online platforms, encouraging them to promote authoritative sources, reduce the visibility of content that is found to be false or misleading, and remove content that could cause physical harm or is illegal.

The United Nations Development

United Nations Development Programme (UNDP)

Programme (UNDP) is the United Nations' global development network. It is funded entirely by voluntary contributions from UN member states. The organisation operates in 177 countries, where it works with local governments, to meet development challenges and develop local capacity. It works internationally to help countries achieve the Sustainable Development Goals (SDGs).

The organisation is fully operational in 170 countries and territories, responding to a growing volume of requests from countries to help them prepare for, respond to and recover from the COVID-19 pandemic; focusing particularly on the most vulnerable.

UNDP's COVID-19 response is framed around three objectives for helping countries to:

1 Prepare for and protect people from the pandemic and its impacts

2 Respond during the outbreak

3 Recover from the economic and social impacts in the months to come

In India, UNDP has identified three immediate priorities in support of Government responses, and in line with the global UNDP Integrated Response to COVID-19 and the UN in India Programmatic Response to COVID-19:

1. Health systems support: UNDP is supporting India to strengthen health systems, by procuring urgently needed health and medical supplies, advising on management of biomedical waste and supporting capacity building of health workers to respond to COVID-19, based on requests from State Governments. Working in collaboration with WHO, UNDP is drawing on its extensive presence across states and leveraging its network of 700 staff that support Government health projects, in 30 States. UNDP has allocated USD 4 million for this intervention.

UNDP India is procuring and providing personal protective equipment such as masks, gloves, sanitisers and thermal scanners for use at health facilities, across 8 states which include Delhi, Gujarat, Nagaland, Meghalaya, Chattisgarh, Uttarakhand, Himachal Pradesh and Arunachal Pradesh. The organisation has distributed 600,000 masks, 333,000 gloves, 15,000 hand sanitisers, and 250 infrared thermal scanners to support health workers, at the last mile in India's fight against COVID-19.

Also, UNDP's eVIN India mobile application which digitises vaccine stocks, and storage temperatures is now being used to track the supply of over 81 essential COVID-19 materials, in more than 1500 health facilities in 8 states.

2. Supporting multi-sectoral coordination and inclusive responses: UNDP is collaborating with State Governments, civil society and private sector partners; to assist in planning as well as coordination of response and recovery efforts to strengthen community outreach. This includes supporting State Governments on multi-sectoral planning and coordination of COVID-19 responses, generating awareness through community outreach as well as social media, addressing stigma,

discrimination and gender-based violence, along with building capacity of community groups, to provide psycho-social support. UNDP has allocated USD 5.5 million for this intervention.

3. Social and economic impact: UNDP is currently producing country-specific assessments of the COVID-19 economic impact, policy options to contain it, and approaches to protect the most vulnerable. The organisation is assessing how existing instruments in each country, including subsidies, transfers and existing social protection instruments, can be used for short-term response to the crisis. UNDP has allocated USD 1.5 million for this intervention. In India, UNDP in collaboration with State

Governments, civil society organisations, the private sector and UN agencies, is prioritising vulnerable communities including the urban poor, tribal communities, marginalised women and youth, disadvantaged castes and groups, waste collectors, construction workers as well as migrants. This support includes expanding reach of social protection schemes and entitlements to marginalised individuals and their families; facilitating access to local skilling as well as job opportunities for vulnerable women and youth; restoring livelihoods opportunities for women micro-entrepreneurs as well as farmers' and artisans' collectives; supporting State Governments in developing inclusive economic recovery plans; and reviewing SDG plans as well as indicator frameworks to account for COVID-19 impact.

> In India, UNDP in collaboration with State Governments, civil society organisations, the private sector and UN agencies, is prioritising vulnerable communities.

photo credit- UNDP Iraq_Abdullah Dhiaa

World Bank Group (WBG)

The World Bank Group (WBG) is a family of five international organizations that make leveraged loans to developing countries. Its five organisations are the International Bank for Reconstruction and Development (IBRD), the International Development Association (IDA), the International Finance Corporation (IFC), the Multilateral Investment Guarantee Agency (MIGA) and the International Centre for Settlement of Investment Disputes (ICSID). The first two are sometimes collectively referred to as the World Bank.

As a response to COVID-19 pandemic, WBG is taking fast action to help developing countries strengthen their pandemic response, increase disease surveillance, improve public health interventions, and help the private sector continue to operate and sustain jobs. Over 15 months, WBG will be providing up to USD160 billion in financing tailored to the health, economic and social shocks countries are facing, including USD 50 billion of IDA resources on grant and highly concessional terms.

On 2 April 2020, the first group of projects using the dedicated COVID-19 Fast-Track Facility, amounting to USD 1.9 billion and assisting 25 countries, was rolled out. Further, as part of the World Bank Group's USD 14 billion fast-track financing package, IFC, WBG's private sector arm, is providing USD 8 billion in fast-track financial support to existing clients to help sustain economies and preserve jobs during this global crisis, which will put the poorest and most vulnerable countries at most disadvantage. In addition, the World Bank is working worldwide to re-deploy resources in existing World Bank financed projects, including through restructuring and use of projects' emergency components, as well as contingent financing instruments designed for catastrophes, including pandemics. On 19 May 2020, the Bank Group announced its emergency operations to fight COVID-19 have reached 100 developing countries; home to 70 percent of the world's population.

Asian Development Bank (ADB)

The Asian Development Bank is a regional development bank established in 1966, headquartered in Manila, Philippines. Currently having 68 countries as members, the organisation is modelled closely on the World Bank, and has a similar weighted voting system where votes are distributed in proportion with members' capital subscriptions.

On 28 April 2020, ADB approved USD 1.5 billion COVID-19 Active Response and Expenditure Support (CARES) programme to support India in its immediate pandemic response efforts. This included disease containment as well as prevention, along with social protection measures for the economically vulnerable, particularly women and disadvantaged groups. The CARES programme is funded through the COVID-19

pandemic response option (CPRO) under ADB's Countercyclical Support Facility. CPRO was established as part of ADB's USD 20 billion expanded assistance for developing member countries' pandemic response.

Further, the multilateral funding agency ADB approved USD 3 million grant to India from its Asia Pacific Disaster Response Fund, in July 2020 to further support the government's emergency response to COVID-19 pandemic. The grant, which is financed by the Japanese government, will be used to procure thermal scanners and essential commodities, to strengthen the India's COVID-19 response by enhancing disease surveillance, earlydetection, contact tracing, and treatment.

International Monetary Fund (IMF)

The International Monetary Fund (IMF) is an international organisation headquartered in Washington, D.C., consisting of 189 countries, working to foster global monetary cooperation, secure financial stability, facilitate international trade, promote high employment as well as sustainable economic growth, and reduce poverty.

The IMF is deploying its entire lending capacity of USD 1 trillion, at the service of its membership to respond to the coronavirus crisis. In addition to providing policy advice and technical assistance, the Fund's actions are focused on the following tracks:

1. **Emergency financing:** The IMF is responding to an unprecedented number of calls for emergency financing – from 102 countries so far. The Fund has doubled the access to its emergency facilities—the Rapid Credit Facility (RCF) and Rapid Financing Instrument (RFI) —allowing it to meet the expected demand of about $100 billion in financing. These facilities allow the Fund to provide emergency assistance without the need to have a full-fledged program in place. Financing has already been approved by the IMF's Executive Board at record speed for nearly 60 countries.

2. **Grants for debt relief:** The IMF Executive Board approved immediate debt service relief to 27 countries, under the IMF's revamped Catastrophe Containment and Relief Trust (CCRT) as part of the Fund's response to help address the impact of the COVID-19 pandemic. This provides grants to the Fund's poorest and most vulnerable members to cover their IMF debt obligations for an initial phase over the next six months, and will help them channel more of their scarce financial resources towards vital emergency medical, and other relief efforts.

3. **Calls for bilateral debt relief:** The IMF Managing Director and the President of the World Bank recognized the heavy burden this crisis is having on Low Income Countries and, on 25 March 2020, called on bilateral creditors to suspend debt service payments from the poorest countries. The G20 responded to this call on 15 April 2020, by suspending repayment of official bilateral credit from the poorest countries. This will serve as a powerful,

fast-acting initiative that will do much to safeguard the lives and livelihoods of millions of the most vulnerable people. The International Institute for Finance, too, responded to this call by urging private-sector creditors to forgo debt payments until the end of the year without declaring borrowers in default.

4. **Enhancing liquidity:** The IMF has also approved the establishment of a Short-term Liquidity Line (SLL) to further strengthen the global financial safety. The facility is a revolving and renewable backstop for member countries with very strong policies as well as fundamentals in need of short-term moderate balance of payments support.

5. **Adjusting existing lending arrangements:** The Fund is also augmenting existing lending programs to accommodate urgent new needs arising from the coronavirus, thereby enabling existing resources to be channeled for the necessary spending on medical supplies as well as equipment, and for containment of the outbreak.

6. **Capacity development:** In response to the pandemic, the IMF is providing real-time policy advice and capacity development support to over 160 countries, to address urgent issues such as cash management, financial supervision, cyber security and economic governance. In particular, the Fund has been working with tax administrations and budget offices in

many countries to help them restore operations as well as in strengthening support to businesses and individuals, without compromising safeguards and accountability. IMF technical experts are also working with countries to revise and update their debt management strategies. The Fund has also made its online courses available to government officials and members of the general public with extended registration and completion timelines. In addition, the IMF has launched its Learning Channel on YouTube, offering short and targeted on-demand micro-learning videos.

Organisation For Economic Cooperation And Development (OECD)

The Organisation for Economic Co-operation and Development (OECD), is an intergovernmental economic organisation with 37 member countries; founded in 1961 to stimulate economic progress and world trade. Member countries are high-income economies with a very high Human Development Index (HDI).

The OECD is compiling data, analysis and recommendations on a range of topics to address the emerging health, economic and societal crisis as well as to facilitate co-ordination. The organisation contributes to the necessary global action by providing guidance on the short-term measures needed in affected sectors, with a specific focus on

the vulnerable sectors of society and the economy. Beyond immediate responses, it aims to provide analysis on the longer-term consequences, paving the way to recovery with co-ordinated policy responses across countries.

Way Forward

The struggle against the COVID-19 crisis requires global cooperation and solidarity, key to which are multilateral and rather universal international organisations like WHO.

Considering the transmission of the virus is not inhibited by political borders, it has to be acknowledged that the solution to this global crisis must be at the global level. Key organisations are coordinating international efforts, including airlifting material as well as medical staff, managing multilateral research on the pandemic, sharing essential information and initiating relief funds.

The role of international cooperation and multilateral organisations becomes much more heightened in a post COVID-19 world. Countries will require their assistance and support, including sufficient financing, to strengthen the health systems against COVID-19. A pivotal concern would be equitable access to COVID-19 treatment and vaccines in the future.

While the current pandemic has forced us to limit our movements and follow physical distancing, unfortunately, it does not restrict the spread and impact of other adversities. Quite the opposite, as the health services are focused on COVID-19, the risk of other ailments, especially infectious diseases grows. COVID-19 has disrupted the immunisation programme across the world. Role of WHO becomes extremely valuable in this regard. WHO is supporting various COVID-19 impacted countries in Africa, Europe and Asia-Pacific regions, including Italy, Syria and Rohingya camps in Bangladesh, in resuming their immunisation programmes.

Similarly, in the fields of education, WASH, gender issues, elderly care, skill development and economic empowerment of the vulnerable, the reach and capacity of key institutions such as UNDP, UNICEF, UN Women, etc. will play a crucial role in the coming years to bring the world back to normalcy. The support of financing institutions such as the World Bank Group, IMF, ADP, etc will be required by the under developed as well as the developing countries to resuscitate their waning economies.

Photo World Economic Forum - Source- Reuters
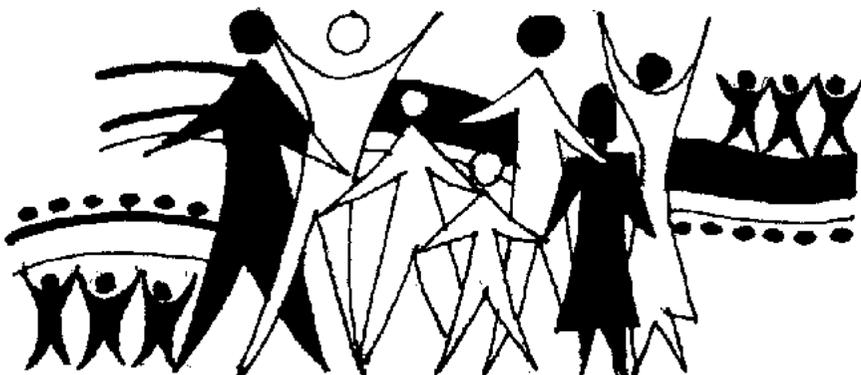
COVID-19 and the World Economy

Introduction

Novel Coronavirus 2019 (COVID-19), since it was first reported in December 2019, has exacted a massive toll on human lives, health systems and the world economy. Governments across the world have closed international borders, stopped international and domestic transport, and closed/restricted activities to contain the virus' spread, leading to a standstill in economic activities in many countries, disruption of global and regional value chains, and leaving millions unemployed.

In this context, this paper discusses the direct effects on aspects of the economy such as GDP, employment, trade, etc., some of the social effects and the ability of societies to achieve the Sustainable Development Goals (SDGs). We study responses of governments and major international organisations to ameliorate the adverse effects. Finally, we suggest measures to deal more effectively with such occurrences in the future.

Effects on the Economy

a)   Disruption of the Supply Chain

Governments have enforced measures to restrict/eliminate interactions among people, the so-called lockdown, to prevent the infection's spread, thereby derailing the entire production chain. Successful production requires a producer to purchase inputs, hire workers to transform these into outputs that are then sold. The supply side is disrupted as a producer cannot get inputs, as suppliers cannot get workers together to produce, and he cannot assemble his workers. The demand side is disrupted as he cannot get goods to buyers, shops are shut,

and buyers do not have enough income to buy. In the case of COVID-19, the entire supply chain is broken with both demand and supply sides collapsing.

For production to restart, a producer must get apart from his inputs, his workers and buyers. For him to get his inputs, his suppliers must produce, and they will do so only if assured of a buyer, but the buyer will only buy if he knows that he can sell. To get the entire supply chain working requires coordination.

The disruption of the supply chain is reminiscent of Nurkse's (1953) cycle of poverty where since incomes were low, demand was low, and so businesses had little incentive to invest, and since investment was low, income would remain low. The solution was to generate a coordinated increase in investment in a number of industries each of which would hire workers. The output of a company in an industry would then be bought by workers in other industries, whose income had now increased. Tackling COVID-19 requires a coordinated response to get both the supply and demand sides moving. Policy responses that tackle only the supply or the demand side would be inadequate.

b)   Direct Economic Effects

We discuss two aspects of the predictions about economic performance: One is the state of the economy in the current or future years compared to 2019, and the second is the COVID-19 effect, namely the difference in the projections for 2020 and 2021 made earlier in 2020 with those made later in 2020.

GDP Slowdown

The discussion in this section is based on The International Monetary Fund's World Economic Outlook (WEO) of October 2020. WEO gives the estimated growth rates for 2019 (Table 1 Col. 1). It gives the forecasted growth rates for 2020 and 2021 (Table 1, Col. 2 and 3). We add these two to get the overall growth over the two years (Table 1, Col 4).

The IMF had also issued WEOs in January, April and June, 2020. Table 1 columns 5 and 6 give the difference between the October 2020 and June 2020 predictions for 2020 and 2021. And col. 7 is the total difference over the two years. Column 8 and 9 gives the difference between the October and April predictions and column 10 is the sum of these two years difference. Column 11 and 12 give the difference between the October prediction, and that in January, before the COVID-19 effect became obvious. This difference we call the COVID-19 effect.

One thing to note is the considerable uncertainty about the effect of COVID-19 on the economy. The January 2020 forecast predicted growth of world GDP in 2020 of 3.4 per cent, with developed countries growing at 1.6 per cent and developing countries at 4.4 per cent (IMF, Jan 2020). The April 2020 forecast had the GDP of the world economy falling by 6.3 per cent, that in the advanced countries by 7.7 per cent, and in developing countries by 5.4 per cent. The June 2020 forecast predicted a decline of world GDP by 4.9 per cent, that in the developed countries by 8 per cent and in developing countries by 3 per cent. The October 2020 WEO predicts world GDP

Table 1: Growth of Real GDP (percentage)

| | 2019 | Projections | | | Difference from June 2020 WEO Update | | | Difference from April 2020 WEO | | | Difference from Jan 2020 WEO | | |
| | | 2020 | 2021 | Total (Col 2+3) | 2020 | 2021 | Total (Col 5+6) | 2020 | 2021 | Total (col 8+9) | 2020 | 2021 | Total (10+12) |
	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9	Col 10	Col 11	Col 12	Col 13
World Output	2.8	-4.4	5.2	0.8	0.8	-0.2	0.6	-1.1	-0.5	-1.60	-7.7	1.8	-5.9
Advanced Economies	1.7	-5.8	3.9	-1.9	2.3	-0.9	1.4	0.3	-0.6	-0.30	-7.4	2.3	-5.1
United States	2.2	-4.3	3.1	-1.2	3.7	-1.4	2.3	1.6	-1.6	0.00	-6.3	1.4	-4.9
Euro Area	1.3	-8.3	5.2	-3.1	1.9	-0.8	1.1	-0.8	0.5	-0.30	-9.6	3.8	-5.8
Japan	0.7	-5.3	2.3	-3	0.5	-0.1	0.4	0.1	-0.7	-0.60	-6	1.8	-4.2
EMDE	3.7	-3.3	6	2.7	-0.2	0.2	0	2.1	-0.5	1.60	-7.7	1.4	-6.3
Emerging and Developing Asia	5.5	-1.7	8	6.3	-0.9	0.6	-0.3	-2.7	-0.5	-3.20	-7.5	2.1	-5.4
China	6.1	1.9	8.2	10.1	0.9	0	0.9	0.7	-1	-0.30	-4.1	2.4	-1.7
India	4.2	-10.3	8.8	-1.5	-5.8	2.8	-3	-12.2	1.4	-10.80	-16.1	2.3	-13.8
Emerging and Developing Europe	2.1	-4.6	3.9	-0.7	1.2	-0.3	0.9	0.6	-0.3	0.30	-7.2	1.4	-5.8
Russia	1.3	-4.1	2.8	-1.3	2.5	-1.3	1.2	1.4	-0.7	0.70	-6	0.8	-5.2
Latin America and the Caribbean	0	-8.1	3.6	-4.5	1.3	-0.1	1.2	-2.9	0.2	-2.70	-9.7	1.3	-8.4
Brazil	1.1	-5.8	2.8	-3	3.3	-0.8	2.5	-0.5	-0.1	-0.60	-8	0.5	-7.5
Middle East and Central Asia	1.4	-4.1	3	-1.1	0.4	-0.5	-0.1	-1.3	-1	-2.30	-6.9	-0.2	-7.1
Sub-Saharan Africa	3.2	-3	3.1	0.1	0.2	-0.3	-0.1	-1.4	-1	-2.40	-6.5	-0.4	-6.9
South Africa	0.2	-8	3	-5	0	-0.5	-0.5	-2.2	-1	-3.20	-8.8	2	-6.8

Source: World Economic Outlook, October 2020, IMF and World Economic Outlook Jan 2020.
Note: EMDE is Emerging Market and Developing Economies

would decline by 4.4 per cent, by 5.8 per cent in developed countries and by 3.3 per cent in developing countries. Secondly, the effect on the developed and developing countries is also different. The October 2020 WEO predicts a lesser effect on the developed countries than did the June 2020 WEO but it predicts a larger decline in developing countries. Furthermore, the mainly positive values in column 4 and 5 indicates that prospects have improved in October 2020 compared to June 2020 for developed countries, and most developing country regions, except Asia.

While the details may differ, there is no doubt that COVID-19 will lead to a decline in GDP growth, values in column 2 are negative. Furthermore, values in column 4 are mostly negative, showing that the net effect over the two years is a fall in income. The negative values in column 11 further show that the outlook had worsened by October, compared to January, and this is the COVID-19 effect. Again, the negative values in column 13 shows that over the two years the June forecast depicts a worsening situation, compared to the January forecast. Thus, undoubtedly COVID-19 is predicted to worsen GDP growth.

The COVID-19 effect is projected to be larger in developing countries, particularly commodity exporting ones (Table 1, column13).[1] GDP is projected to be lower by 5.1 percent because of COVID-19 in developed countries and slightly more, 6.3 percent, in developing countries.[2]

All developing country regions show a decline in income over the two years, 2020 and 2021. The Latin America and Caribbean

(LAC) region shows the largest decline in 2021 compared to 2019, about 8.4 per cent (Table 1 Col. 13). Middle East and Central Asia and SSA show declines of about 7 per cent. Asia is projected to show a much smaller decline with GDP in 2021 with the prediction in October being 5.4 per cent lower than the January prediction. (Table 1, col. 13). [2]

We now analyse COVID-19's effect on the demand structure of the economy in the four regions, EAP, LAC, SA and SSA as that might influence future growth potential. The projections in GEP show that overall there is as shift from private consumption to public consumption because of declines in private incomes and government efforts to resuscitate the economy. Fixed investment falls, except in EAP, over the two years 2020 and 2021. Also exports fall over the two years by 6 per cent in three of the regions, but by 8 per cent in SA. The fall in investment and in exports does not augur well for future prospects (World Bank, 2020a).

Employment

The economic retrenchment has resulted in a substantial increase in unemployment. The ILO (2020) estimates that there was a 17 percent loss in hours worked in the second quarter of 2020, compared to last quarter of 2019. In its June monitor it sees unemployment worsening compared to its earlier predictions.

The position is worse in developing countries. Hours worked declined the most in LAC by about a third, and in SA by almost a quarter. EAP fared the best

with employment declining by only about 5 per cent.[4] In the developed countries hours worked declined by about a sixth. Furthermore, the decline in prospects since the April forecast is worst for LAC and SA, and the best for Western Europe. Prospects for labour have worsened not only in terms of loss of unemployment, but also decline in terms of income. ILO estimates a decline in labour income of about 11 per cent over the first three quarters of 2020, with workers in lower middle-income countries faring worse with a 15 per cent decline in income.

Remittances

Remittances to low-income and fragile countries were USD 359 billion in 2018, exceeding foreign direct investment (FDI), portfolio investment, and foreign aid as the single most important source of flows from abroad. Global remittances, whose growth had slowed in 2019, may decline by about 20 per cent in 2020 because of decline in wages and employment of migrant workers (Sayeh and Chami 2020, 17). Remittances are expected to fall across all World Bank Group regions (World Bank, 2020b). This drop in a crucial financing lifeline for many vulnerable households is likely to lead to increased child labour (ILO-UNICEF, 2020) and increased economic, fiscal and social pressures on their governments (Sayeh and Chami 2020, 16).

Trade

The 2008 financial crisis was a major shock to the world trading system with an almost 20 per cent drop in the share of exports of goods and services in GDP (XGS), including

in developing country regions, reversing the earlier trend since the Second World War of increasing XGS. Since 2009 trade had been recovering gradually and XGS was higher by 2018 for all income groups, except the low income countries where it was still 25 per cent lower. Among the regions, the drop in XGS is particularly large in EAP, a third and SA a quarter.

The COVID-19 crisis has dealt another blow to world trade which is projected to decline by about 20 per cent in 2020, and despite some recovery in 2021 would still be about 10 per cent lower than in 2019 (WTO, 2020). Exports of goods and services are expected to decline by about 10 per cent in 2020 in the developing country regions of EAP, LAC, SA and SSA, and would still in 2021 be about 6 to 8 per cent lower than in 2019 (*ibid*). Disrupted supply chains because of slowdown in the US and China reduced exports from Mexico and Brazil, and especially from commodity-producers such as Chile and Peru. The severe contraction in the United States affected Central America through reduced exports and remittances and reduced tourism to many Caribbean countries and Mexico (UNCTAD, 2020).

Services trade accounts for one fourth of global trade in goods and services. Though services trade was more resilient than merchandise trade during the global financial crisis of 2008, COVID-19 could severely impact trade in services as well, e.g. tourism, transport, education and health services abroad that require physical proximity (Singhal, 2020). The impact on individual countries depends on the composition of service exports.

Box 1: COVID-19 and The Indian Economy

India is one of the most severely affected countries in the world both in terms of cases and deaths, and also its economy. India's declining economic growth before the COVID-19 outbreak[5] has been accentuated. The prediction is that the fall in GDP in 2020 (-10.3 per cent) will be partially compensated by growth in 2021 (8.8 per cent), but GDP in 2021 would be lower than in 2019. But the COVID-19 effect for GDP is negative in both 2020 and 2021. While India's performance is worse than China's where GDP is expected to grow by 8 per cent over the two years, it is better than that of the other three BRICS countries where GDP is expected to fall over 2020 and 2021 (World bank Global Economic Prospects, June 2020). Government of India data for Q1 of 2020-21 showed a 23.9 per cent decline in GDP making it the worst affected economy in the World. India's exports plunged by 60 per cent in April 2020. However, India's service exports mainly IT exports (40 per cent of total service exports) are more resilient than other countries, dependent heavily on tourism (Singhal, 2020).

With 122 million lost jobs in India, the highest in Asia, the unemployment rate is likely to rise to 27 per cent in 2020 (Centre for Monitoring the Indian economy) of which about 5 million were white collar jobs (Vyas, 2020) and 4 million youth (ILO-ADB, 2020). Remittances to India would decline by 23 per cent to USD 64 billion in 2020 (World Bank 2020b) due to job losses and falling wages. The ILO estimates job losses might push an extra 400 million workers into poverty, to add to the 270 million people poor in 2011-12 (consumer expenditure survey of NSSO, India).

More than 20 per cent of children in India were stunted in 2019, and there were more than 23 million wasted children. Also, over 80 per cent of adolescents in India suffered from micronutrient deficiency (UNICEF). Stagnant or deceasing per capita income would worsen the situation. India had witnessed 1.04 million under-five deaths in 2017 due to child malnutrition. The UNICEF study pointed that as many as 6000 children die over six months starting from May 2020, due to disruption in medical supplies and food supplies (Tiwari and Pandey, 2020).

It should be recognised that informal activities will be absorbed by the formal sector only over the longer term. Immediately policies to raise productivity and human capital formation in the informal sector are needed. Digital technologies could help the informal sector increase productivity and integrate better into markets, and so access to internet and digital technologies needs to be significantly broadened.

Though exceeding fiscal deficit targets should not be a matter of concern the government should define a credible plan to return to the rules over the medium term. In the short term judicious foreign borrowing could supplement domestic resources. In the longer term taxes on more affluent individuals and companies should be raised. The Indian Government could tap the available external financing while following sound debt management practices.

Social Effects: Consequences for Achieving the Sustainable Development Goals (SDGs)

Poverty

Since 1990, the share of the world population living below the extreme poverty line of USD 1.90 per day has fallen rapidly from 35.6 percent in 1990, to 10.0 percent in 2015 (World Bank, 2018). The projected reduction in growth in developing countries of about 6 percent will raise the number of these extremely poor by about 100 million, namely more than 1 percent (Sumner et al, 2020), making achievement of the SDG goal of eliminating poverty difficult. Almost all those pushed into poverty are in SA and SSA.

COVID-19 is also expected to worsen the income distribution, as worker incomes have fallen, while the wealthy have seen their wealth increase. A worsening of the Gini coefficient by 1 to 2 per cent, would add 1 to 2 per cent to the number of the poor.

Malnourishment

Currently, 1 in 9 people – 820 million worldwide are hungry or undernourished, with numbers rising since 2015, when it was 785 million, in almost all developing country regions, but especially in Africa, West Asia and Latin America (Global nutrition Report, 2020). Other forms of malnutrition include nearly 2 billion people with micronutrient deficiencies. Despite some progress towards select 2025 global nutrition targets, particularly a 10 per cent drop in childhood stunting between 2012 and 2018, progress towards global nutrition targets is far too slow (FAO, 2019). One in seven newborns, or 20.5 million babies globally, suffered from

low birthweight in 2015, a lack of progress since 2012 (Blencowe et al, 2015).

COVID-19 economic crisis will worsen malnourishment because of declining ability to consume essential micronutrients usually contained in the more expensive vegetables, fruits, and animal-sourced foods. Furthermore, the situation is aggravated by the breakdown of value chains supplying such highly perishable foods. For instance, the 1998 Indonesian financial crisis resulted in dramatic declines in egg, meat, and vegetable consumption, and children's mean weight-for-height declined by over one-third of a standard deviation, and child anaemia increased (Heady and Ruel, 2020).

COVID-19 is expected to increase the food insecurity by 265 million by end of 2020, (World Food Program, 2020). Pandemic-induced interruptions to health, nutrition, and social protection services will worsen the situation. UNICEF estimated that coverage of essential maternal and child nutrition and health services had dropped by roughly 30% on average, since the outbreak.

Stunting reduces a child's ability to read, particularly for poor children because poverty compounds the risk for poor child development. Stunting in children reduced at the age of eight, the Peabody Picture Vocabulary Test score by 16.1 per cent and Quantitative Assessment test 48.8 per cent. Stunting also reduces likelihood of formal employment (Carba et al. 2009). Furthermore, a 1 per cent decrease in height was associated with a 2.4 per cent decrease in wages in Brazil (Thomas and Strauss 1997). Guatemalan men 26–46 years of age provided a nutrient between birth and 2 years of age had 46 per cent

higher average wages (Hoddinott et al. 2008). Stunting in early life has adverse functional consequences on the child, including poor cognition and educational performance, low adult wages, lost productivity. COVID-19 will affect children health directly and indirectly.

Mortality Rates

Currently, there are approximately 24,500 maternal deaths and 431,690 child deaths per month in the 118 sample countries (Roberton et al., 2020). Small reductions in income will result in an additional 10 per cent maternal and child, while a severe reduction in income will result in more than a third additional maternal and child deaths per month (*ibid*). Reduction in health coverage would worsen the situation. Again, while a relatively small reduction in health coverage would raise child and maternal deaths over 6 months by 10 per cent, a severe reduction would result in about additional 40 per cent child and maternal deaths.

Government Responses

Policy authorities, having learnt from the 2008 financial crisis, responded very quickly to the COVID-19 created economic crisis. Furthermore, there is great similarity in their responses. Central banks cut monetary policy rates, provided liquidity and credit facilities, instituted interest moratoria, and embarked on various asset purchase programs.[6] These measures to help the flow of credit, are expected to induce a supply response from companies. There was greater variety in fiscal responses partly because of differences in their fiscal situation. Some countries with low deficit to GDP and low government debt to GDP ratios acted aggressively to support their economies and increased their expenditures. Others more constrained took only limited

action. Fiscal measures were of two kinds-humanitarian and those taken to support the economy.[7] The former included emergency health spending, direct transfers to vulnerable households, and expanded social safety net expenditures such as higher ration allocations in India, increased unemployment benefits etc. Measures to revive the economy included tax breaks, and deferrals, credit guarantees and special local government bond issuances to boost investment. The size of the fiscal stimulus has varied among countries, e.g. among the G20 countries it varied from more than a fifth of GDP in Japan to almost zero in Mexico.[8]

In some SA economies systemically important firms with high levels of debt may require government support. Furthermore, interest and loan moratoria may weaken balance sheets of banks. Government actions to support companies and banks will adversely affect government finances, making them more vulnerable to reversal of global capital flows and higher global financial market uncertainty. Corporate balance sheet weakness would hinder capital investment. High debt and deficits limit the scope and effectiveness of fiscal stimulus.

In SSA also fiscal constraints has meant that there has been reprioritisation of existing budgets, rather than increased spending. Help from bilateral creditors to temporarily suspend debt payments from fiscally constrained low-income countries and. emergency support packages may be necessary.

International Responses

Major international institutions have responded to the COVID-19 crisis. The multilateral development banks (MDBs) have enlarged their lending programmes.

The World Bank Group is committed to provide USD 160 billion by June 2021, including over USD 50 billion of IDA resources on grant and highly concessional terms, to 111 countries.[9] Its operations emphasise social protection. The Bank is also helping countries access critically needed medical supplies by reaching out to suppliers, on behalf of governments.

Asian Development Bank has committed USD 11.2 billion in grants, technical assistance, loans, and private sector assistance to help its developing members as they address the devastating impacts of the COVID-19 pandemic. The African Development Bank (AfDB) raised USD 3 billion through a social bond issued on 27 March 2020 to enlarge its resources, to help its members. The AfDB has deployed USD 10 billion through a COVID-19 Rapid Response Facility (CRF) to provide flexible support to countries. The Inter-American Development Bank (IDB) is expanding the risks covered under the Contingent Credit Facility for Natural Disaster Emergencies (CCF), to include public health risks and COVID-19. For the COVID-19 pandemic outbreak, countries can request up to USD 90 million or 0.6 per cent of GDP, whichever is less.

The IMF has expanded its resource by about a USD 1 trillion of which it is currently making about USD 250 billion available to member countries. It has already provided assistance of about USD 89 billion to 81 countries. It has also responded to other members' requests using its various facilities. It has provided 100 billion through its Rapid Credit Facility and Rapid Financing Instrument. The Fund is also increasing its capacity to provide concessional financing at zero-interest, to low-income poorest countries under the Poverty Reduction and Growth Trust (PRGT) facility. The IMF is close to its USD 17 billion target in new PRGT resources through new pledges. Debt relief has been provided to 29 countries under the IMF's revamped Catastrophe Containment and Relief Trust (CCRT) The Fund seeks to increase the CCRT to USD 1.4 billion, to provide two years of grant-based debt relief.

The G20 responded to the call by IMF Managing Director and the President of the World Bank to suspend debt service on official bilateral credit, under the Debt Service Suspension Initiative (DSSI). By end-September 2020, 60 per cent of eligible countries (44 of 73 countries) had already applied for suspension of official bilateral debt payments, which would amount to a deferral of around USD 5 billion of debt service for 2020. The Fund, the World Bank and the G20 have also called for private sector creditors to participate in similar debt relief on comparable terms, which could add a further USD 7 billion of relief.

The WHO has set up COVAX to help the development of a vaccine and to deliver two billion doses of safe, effective vaccines by the end of 2021. These vaccines will be delivered equally to all participating countries, proportional to their populations, and then expanding to cover 20 per cent of the population of participating countries. The participating countries covering more than 60 per cent of the world's population are 75 countries, which would finance the vaccines from their own public finance budgets, and about 90 lower-income countries that could be supported through voluntary donations to Gavi's COVAX Advance Market Commitment (AMC). Governments have already committed USD 1.4 billion towards this effort, but an

additional USD 1 billion is still needed. It is also essential that the Gavi COVAX AMC which has raised about USD 700 million meets its fundraising target of at least USD 2 billion, by the end of 2020.

The Future

Recovery from this crisis necessitates co-operation, as a vaccine will be most effective if it is available cheaply everywhere (competition and 'vaccine nationalism' would be detrimental. The multilateral fundraising efforts for a vaccine need to be bolstered by expanding manufacturing capacity to meet projected demand, (OECD 2020) and distribution. Cooperation in vaccine development has to be complemented by reversing protectionist policies recently instituted, resisting imposing further barriers, and strengthening the robustness and resilience of supply chains (Caldera and Koirala, 2020). Risk management research suggests that shorter supply chains and domestic self-sufficiency do not necessarily imply reduced vulnerabilities, so complex long supply chains are not a problem. Rather, supplier diversification can help firms maintain production in times of crises (Miroudot 2020). Governments also need to agree upfront on rules for international property rights and procurement, and impose universal standards for vaccine approval (OECD 2020). Finally, an international commitment to a fair allocation system, necessary to ensure that the vaccine will be widely available, is needed.

Better preparedness is crucial to face future pandemic risks (Commission on a Global Health Risk Framework for the Future; National Academy of Medicine Secretariat 2016). This would require globally co-ordinated mechanisms; such as early warning systems, and common protocols for travel and border control restrictions (Dervi and Strauss, 2020). Also needed are agreed global frameworks for emergency preparedness, and facilitate research agendas, and technology development as was done through the Coalition for Epidemic Preparedness Innovations, a global network of public and private stakeholders (OECD 2020). Enhanced efforts to address the global shortage of health workers through initiatives such as the ILO, OECD, and the WHO Working for Health programme, would also be welcome.

Conclusion

COVID-19 has had serious adverse effects on economies of all countries and their well-being. GDP, employment and trade will be lower in 2021, than it was in 2019. Poverty, malnourishment, and child and maternal mortality rates will increase. Government actions will ameliorate the effect, but no government has acted to tackle in a coordinated manner the joint supply and demand side disruptions cause by COVID-19. Developing countries will be affected more seriously than developed countries. Furthermore, their growth potential will be dented. It is more difficult to devise policy measures to sustain the informal sector, which is large in developing countries, and their governments are usually more constrained fiscally. International financial institutions have reacted rapidly, expanding their facilities to provide financial support to countries. WHO has sought to encourage international cooperation in the development of a vaccine against COVID-19, and has also sought to mobilise resources to ensure availability of the vaccine in developing countries.

How COVID-19 Exposed the Public Character of Health

Law and order is cited as a classic example of a pure public good in economics. It is non-rival in consumption – no matter how much it is used by some, the amount available for use by others remains intact. Once provided, it can be supplied to additional users at zero marginal costs. Hence charging a positive price would violate the standard efficiency criteria of equating price with marginal costs, and exclude some users. It is also non-excludable – once provided, it is nearly impossible to exclude others from using it, leading to market failure. Hence, economists from all ideological paradigms tend to agree that provision of pure public goods cannot be left to the forces of the market mechanism. So, governments in almost all nations assume the entire responsibility of providing law and order for the safety and security of its citizens. If the state fails to provide law and order, no matter how much an individual spends on securing his/ her own house, and on his/ her private security guards while moving around, there would never be a complete sense of individual (and collective) safety, security, and freedom. We do not have to be too imaginative to visualise the plight of the people living in areas ruled by bounty-hunters/ gangsters, where the state law and order machinery has virtually collapsed, as depicted in movies/dramas such as *The Good, the Bad and the Ugly, For a Few Dollars More, Sholay, Mirzapur and Gangs of Wasseypur*.

Health, in this sense, in not a pure public good. It is neither non-rival, nor non-excludable and as such, it is perfectly feasible to transaction health services in the market. Indeed, there is a roaring private sector presence in health the world over. After all, one cannot deny that good health depends to a large extent on individual choices and affordability, unlike physical safety and security, which largely depends on law and order enforcement, rather than your own actions.

But here comes the twist. COVID-19 has exposed to all of us how a microscopic organism, spreading through human contact, can create havoc for human lives and livelihoods, and pose an equally dangerous threat to the safety, security, and freedom of all citizens, no less than the absence of law and order. Health, thus no longer remains constricted to individual domains. It becomes an issue of public health, defined as "the health of the population as a whole, especially as the subject of government regulation and support" (lexico.com). Any communicable disease that can spread through contact poses a public health challenge. COVID-19 emerged as a highly contagious infection that spreads not only through direct and indirect touch, but also through droplets in the air near infected individuals. No matter how much an individual takes care of his or her own health by buying "health services" from the market, there is precious little that one can do protect oneself from getting infected by COVID-19. One can of course isolate oneself from society to prevent contagion. But such social isolation is a luxury for the poor and not a fool-proof solution even for the rich and powerful, as they depend on others for their daily needs. We must remember COVID-19 did not spare celebrities like Amitabh Bachchan or former president Pranab Mukherjee. This highlights an important public character of an apparently private good like health. Hence, the state must step in to prevent the spread of the virus during such health emergencies, by imposing rules and restrictions on society.

Once infected, there is no cure but only treatment for the symptoms. This means one is dependent on medical care infrastructure for tiding over the illness. Again, this cannot be left solely to the market forces – the private healthcare sector would prove to be completely inadequate in this regard. First, not all can afford private health care for their treatment. Second, not all private providers may be willing to provide COVID-19 treatment for their own safety. Many private hospitals and nursing homes have closed, as they cannot provide the necessary

protective gear for their medical and para-medical staff. As a result, when the pandemic spreads its wings and infections reach a hike, there could be an acute shortage of medical facilities. However, from the public health perspective, it is crucially important to ensure that every infected individual is treated in the face of such contagious pandemics, no matter whether they can afford the treatment or not. Else they would pose major health threats to the entire community. This can be ensured only by the state and not the market. Presence of a strong and effective public health machinery is the only solution under such circumstances. It would invoke all government medical facilities and create temporary medical camps to overcome this shortage for treating all infected citizens. The private sector can only supplement this effort, but can never take over the entire burden of treatment for all infected citizens, rich and poor. It comes to us as no surprise that a prosperous country like the USA, with a scanty public health infrastructure, is among the worst hit by COVID-19. In the words of Nobel Laureate Paul Krugman: *"America has the advanced world's most privatised, business-oriented health care sector. It also has by far the highest costs and some of the worst health outcomes."*

A third important public character of health stems from the quest for prevention and cure of infections like COVID-19. The pursuit of science, for creating new knowledge to come up with possible vaccines and medications, to prevent and treat contagious diseases like COVID-19, is a public good. The state must therefore invest in health R&D, rather than leaving it to the initiatives of the private sector, so that the new vaccine and/or treatment that is created will not be left to market forces for its universal use. In fact, COVID-19 reveals that in a globalised world, contagion is not limited to national boundaries. The infection spread like wildfire across the globe exposing a global public character of health. If public health does not get its due attention in any part of the world, it may cause frequent local health emergencies, the ripples of which will be felt all over through global transmission.

A final public character of health is reflected through the impact of COVID-19 on the economy and livelihoods. We have seen how COVID-19 brought economic activities to a standstill, causing enormous damage to the national economy. Individuals lost their jobs and incomes, and were pushed to the verge of starvation. Without state support through PDS, income transfers or some such measures, there are no other ways to ameliorate the suffering of the people caused by COVID-19. The tremendous hardships faced by the people, for no fault of theirs, reflect strong negative externalities of COVID-19. Market solutions to tackle these negative externalities are nearly impossible to design and implement, due to high transaction costs. Thus, individual's health (or the lack of it) at times of pandemic like COVID-19 goes well beyond private wellbeing, and produce far reaching adverse economic consequences for the entire society.

Despite such well known public characters of heath, increasingly over the last few decades, we have witnessed how the state in many countries has been slowly withdrawing from shouldering the burden of providing "merit" goods such education and healthcare, leaving them to the private sector.

The UN- SDG declarations in 2015, while setting bold targets to "ensure healthy lives and promote wellbeing for all at all ages" (Goal 3), highlighted the need to rope in the private sector to meet all 17 sustainable development goals by mentioning "private sector" sixteen times in this brief document. This goes completely against the WHO's Alma Atta mandate of the state's responsibility to look after the health of its citizens. The Alma Ata declaration in 1978 clearly stated: "*Governments have a responsibility for the health of their people which can be fulfilled only by the provision of adequate health and social measures*." But states and supra state agencies seem to have forgotten this mandate.

At this juncture, COVID-19 appears as a rude reminder that health has a strong public character, and it cannot be pushed exclusively to the private market domain. The state cannot abdicate its responsibilities of public health provision. It is now high time to bring back health onto the main-stage of governments' functions across the globe. Health must be treated as no less important for the safety, security, and freedom of its citizens than national defence and law and order.

Social Consequences of Global COVID-19 Crisis

Overview

The world is facing an unprecedented socio-economic crisis, rooting from a health emergency. COVID-19 pandemic is upending various strata of societies, imprinting them with various direct and indirect forms of adversities. The challenges of the COVID-19 pandemic are different for various socio-demographic groups. The impact of COVID-19 is particularly detrimental to the most vulnerable segments, including people living in poverty situations, older persons, persons with disabilities, youth, and indigenous peoples.

Early evidence indicates that the health and economic impact of the virus are being borne disproportionately, by poverty stricken sections across the world. For example, homeless people, because of their inability to safely shelter in a place, are highly exposed to the danger of the virus. People without access to running water, refugees, migrants, or displaced persons also stand to suffer disproportionately; both from the pandemic and its aftermath. The impact is due to limited movement, fewer employment opportunities, increased xenophobia etc.

It must be understood that while the pandemic induced shutdowns are not going to be long term, the major social consequences arising out of it will have long standing repercussions, which will have to be borne by the global village.

Domestic Abuse and Gender Based Violence

Gender-based violence is a hidden conse-quence of the COVID-19 pandemic. Around the world, as people have been forced to stay

at home, women and girls are at a greater risk of various forms of gender based violence; including domestic violence, sexual violence and child abuse. Prolonged shutdowns and economic downfall often lead to tensions within households. Even minor triggers at home then lead to episodes of violence. As the response, efforts are focused on containing the disease outbreak. The lockdown and physical distancing measures make it harder for the sexual and reproductive health workers to appropriately screen, for such sexual and gender-based violence.

United Nations Population Fund released a report stating that due to the capacity gaps in countries with high levels of poverty and conflict, COVID-19 will only compound the existing cases of domestic violence. Women helpline calls have increased in Malaysia, Lebanon, France, Argentina, Cyprus and Singapore. On the other hand, a steep decrease in calls in Italy suggests that the lockdown also prevented many women from seeking help. In Kenya as well in China, reports of domestic violence have increased significantly, since the countries began responding to curtail the virus.

Similar to the current pandemic, during the 2013-15 Ebola outbreak in West Africa, governments implemented social distancing strategies such as school closures, curfews, and quarantines. Guinea back then reported a 4.5 per cent increase in sexual and gender-based violence, and twice as many rapes. Needless to say, the needs of women and girls, especially concerning sexual and gender-based violence, are largely ignored in response and recovery planning. However, these statistics from the Ebola epidemic should be viewed as valuable lessons for the current COVID-19 response. An integrated, inter-sectoral, bottom-up approach consisting of prevention and mitigation initiatives is required to tackle the menace.

Impact on the Elderly

It is already known that the COVID-19 disease has been directly hitting the older population harder than other age groups. The fatality rate of 60 plus population across countries, is much higher than under 60. WHO data from October 2020 adds to this; approximately 75 per cent of COVID-19 deaths were among people over 65 years of age.

The high fatality rates among the older adults could be correlated with the fact that they are more likely to already have conditions such as cardiovascular disease, diabetes, or respiratory illness - co-morbidities that we now know raise the risk of severe COVID-19, and related death. Further, a more likely weaker immune system makes it harder for them to fight and survive against the infection that currently has no vaccine.

As a result, the impact on older adults is notable. In Sweden, for example, 90 per cent of the deaths from COVID-19 were among people more than 70 years of age. In Belgium and Canada, respectively 53 per cent and 62 per cent of the country's total COVID-19 deaths occurred in care homes.

Further, various reports have been emerging about the rising risk of abuse among older people due to the pandemic induced lockdowns. As older adults have become dependent on their families and caregivers like never before, some caregivers have exploited the situation to further their control via abuse. It has been found that elder abuse is higher in communities that lack mental health or social care resources. The perpetrators often

Photo Source-Library Terrace

themselves have mental health issues, as well as feelings of resentment which tend to get an outlet in the form of abuse. What is worse that when the elderly experience abuse, they are further exposed to mental health problems; such as depression, high stress, and self-neglect. Thus, there is a higher need for mental health and community support services. Unfortunately, in most countries, however, the funds and staff for these services have witnessed huge cuts, despite the fact that currently they are needed the most.

Impact of Social Isolation on Mental Health

Humans are social animals, we have evolved to feel safest in groups. The current situation has led to physical isolation which triggers stress in humans, as a physiological condition.

Unfortunately, the ongoing instability in the global economy is furthering the stress development.

Loneliness causes stress, and long-term, or chronic stress leads to more frequent elevation of a key stress hormone, cortisol. It is also linked to higher levels of inflammation in the body. This in turn damages blood vessels and other tissues, increasing the risk of heart disease, diabetes, joint disease, depression, obesity, and premature death.

To give an example from recent history, stress before World War II led to a huge number of people getting rheumatoid cardiopathies, correlated with unemployment. Thus, social isolation has been associated with severe medical impacts. The longer the current situation persists, the deeper impact it will

have, and the harder it will be to revert the consequences on human mental health.

Further, anxiety, uncertainty, frustration and loneliness arising out of the current income insecurity, along with lockdown situation have been leading more people to alcohol, drugs and gambling. These addictive habits have been known as the root cause of further degradation of the social fabric, through issues such as domestic abuse, sexual violence and self harm tendencies.

The mental health impact on various groups are significant; elderly, adolescent, women, differently abled, economically weaker sections, addicts recovering from substance abuse and people already dealing with some mental health conditions, are the most vulnerable to the consequences of social isolation arising out of COVID-19. A person having a combination of these identities, would be even more vulnerable to the injustice of isolation.

The New Atmosphere of Suspicion: Racism and Stigmatisation

The COVID-19 outbreak has also strengthened the inherent response of mistrust and suspicion, due to the infectious nature of the disease. The mistrust is multi-level; visible at the residential level with old neighbours eyeing each other with fear. It is furthered at community level, with strangers being perceived as sheer perpetrators of the communicable disease. At a higher level, communities with mongoloid features have been facing dry hostility and sheer racism across the world. At the highest level, the global geo-polity has been shivering with many countries such as the US, taking an aggressive stance against China.

Anxiety and confusion are also arising out of a bulk of unverified, hysterical and fake news;

often comprising of conspiracy theories which further fuel the prejudice against Asians and people of mongoloid ethnicity. Asian-Americans have reported of being spit on, yelled at, even threatened in the streets in US. There has been increased violent targeting at Asian businesses in North America. In Canada, according to the Asian Pacific Policy and Planning Council, Asian Americans reported over 650 racist attacks within a week in May 2020.

Even more unfortunate is the opportunistic misuse of the pandemic, by certain political and pressure groups active in various countries including the United States, United Kingdom, Italy, Spain, Greece, France, and Germany. These groups are misinterpreting the COVID-19 crisis to propagate anti-immigrant, white supremacist, ultra-nationalist, anti-semitic, and xenophobic ideas; through conspiracy theories that demonise refugees, foreigners, prominent individuals, and political leaders.

Impact on Education, Particularly of Vulnerable Groups

Across the world, schools and colleges were among the first institutions to be shut down, as a preventive measure against the outbreak of COVID-19. By the end of March 2020, the epidemic had spread to over 185 countries, and resulted in the closure of over 90 per cent of all schools, colleges and universities impacting close to 1.38 billion students.

As per UNESCO Director-General Audrey Azoulay, "While temporary school closures as a result of health and other crises are not new. Unfortunately, the global scale and speed of the current educational disruption is unparalleled and, if prolonged, could threaten the right to education."

Photo Source : getty images

Two secondary school students -Anita and Lisa, follow a distance learning lesson on the street outside their school to protest against school closures imposed by the government due to spike in COVID-19 infections in Italy

These students, irrespective of gender, social class, race and indigenous groups, have been forced away from formal education. However, the most disadvantaged groups such as adolescent girls have a higher chance of not making it back to school, even after the schools re-open. That is the biggest disruption caused by the pandemic against education. There are higher chances of these girls undergoing a child marriage, particularly in developing and low income countries. As a result, they may not return to schools, as they are cut off from their support systems, and the rising income security pushes their families to further view them as a burden.

Another issue of grave concern that has its roots in closed schools is child abuse. With schools closed and these children trapped at homes, the probability of violence multiplies many times. This is aggravated by the lack of support and care management, due to physical distancing measures at place.

Impact on Youth

Life for youth around the world has changed dramatically, since the advent of COVID-19 outbreak. Even before COVID-19, as per International Labour Organisation, young workers were more likely to be in precarious employment than other age groups. About 77 per cent of youth were estimated to be informally employed globally, and this percentage is even higher for young women in low and lower-middle-income countries. COVID-19 is expected to further contribute to the increasing unemployment.

The pandemic has also brought to halt the education systems all over the world, with far-reaching social consequences for the young people. According to UNESCO, as of May 2020, 191 countries had implemented nationwide or localised school closures, resulting in over 91 per cent of enrolled students, not being able to go to school. The result is a long term disruption

to the education, which will negatively impact not just learning and skill development, but also access to nutrition. Particularly the youth from more disadvantaged conditions would be facing more adverse effect, such as the financially poorer students, students without stable internet access at home, and the ones dependent on schools for their nutrition and health needs.

The situation is especially disadvantaged for girls and young women who are already disproportionately excluded from education.

Indirect impacts of COVID-19 on the youth, would be much more long term and denigrating. There is an expected increase in mental health, or wellbeing concerns due to loneliness and isolation. Youth will face a lack of safe space, especially the ones impacted by violence at home. Absence of therapy and youth clubs might make family relationships challenging. Sitting at home, as the consumption of social media is bound to increase, so will its pressure and related cyber bullying. Cyber bullying itself leads to a vicious cycle of exploitation. Finally, there are high probabilities of youth engaging in gangs, substance misuse, carrying weapons, or other harmful practices due to the looming unemployment.

Thus, as the crisis unfolds, there will be a diverse range of youth related concerns, which will require policy responses tailored to the regional contexts. Countries should invest in rebuilding or strengthening a more resilient society for the youth so that they do not feel lonely, or helpless.

Access to Other Essential Health Services

Non-communicable diseases (NCDs), are responsible for 71 per cent of all deaths globally. Each year, 15 million people in the age group 30-69 years die from an NCD; more than 85 per cent of these "premature" deaths occur in low and middle-income countries.

Since the COVID-19 pandemic began, other essential health services have been severely disrupted. A WHO survey, covering 155 countries, released on 1 June 2020, has reported that the prevention and treatment services for non-communicable diseases has been partially or completely disrupted in many countries. The organisation confirmed that the impact is global, but that low-income countries are most affected.

53 per cent of the countries surveyed have partially, or completely disrupted services for hypertension treatment; 49 per cent for treatment for diabetes and diabetes-related complications; 42 per cent for cancer treatment, and 31 per cent for cardiovascular emergencies. This creates a vicious cycle considering these very co-morbidities make people much more susceptible to the COVID-19 outbreak.

Public screening programmes have been postponed. The most common reasons for discontinuing, or reducing services were cancellations of planned treatments, a decrease in public transport available, and a lack of staff because health workers had been reassigned to support COVID-19 services.

About 20 per cent countries which have reported disruptions, one of the main reasons for discontinuing services was a shortage of medicines, diagnostics and other technologies. Further, while immunisation is understood as an essential health service, it has still been affected by the pandemic, making people susceptible to infectious diseases such as cholera, Ebola, measles, tuberculosis and polio. More than 117 million children, across 37 countries may miss out on receiving a life-saving measles vaccine; many in regions, including Latin America, with ongoing outbreaks. Polio eradication may suffer a double blow due to COVID-19 as well, as due to reduced funding, notably from the United States. In conflict-ridden Yemen, cholera has flourished as an endemic due to the to water shortages, poor sanitation, and decimated the health system, and by mid-2017 it was taking one life an hour.

Similarly, the pandemic has impacted other essential services such as ante-natal care, primary health care and nutrition. As physical distancing continues, income insecurity persists and programme funds get diverted, more mothers would stay anaemic, and more children would be driven towards malnourishment.

Impact on Non-COVID Programmes Funded and Executed by Non-Profits

The international humanitarian and development sector is facing a steep and critical threat from the current pandemic, due to funding constraints. The consequences include downsizing; ironic considering this is the most precarious time when their support could be extremely vital. Further, most of the latest funding is being contributed towards COVID-19 relief. This would weaken the programmes working towards other issues such as SRHR, education, food and nutrition and economic empowerment of the disadvantaged, thereby making the coverage of these programmes incomplete.

The financial models of most international non-profits are structured to cover their central administrative costs, and the country level programmes for delivering measurable, pre-agreed upon impact through programmes designed. These plans are not adequately structured, to anticipate and adapt to a large-scale change such as the current pandemic. It is imperative that the sector develops some form of sustainable financial mechanisms, such as liquidity fund and risk management.

Way Forward

The social consequences of COVID-19 lockdown will not cease to exist, when the medical crises would be contained. The impact of COVID-19 will be longstanding, and most likely generational. It will leave its deep traces in a widespread manner. It is important in such a situation that the response and recovery planning ensures that the most vulnerable sections of the society are kept in the loop.

The eminent social crisis must be addressed through comprehensive policy, to contain inequality, exclusion and discrimination in the medium and long term. Perhaps, comprehensive and universal social protection system might play a durable role in protecting the vulnerable from direct as well as indirect impact of poverty.

Photo Source-Seth Herald_Reuters

COVID-19: A Threat to Democracy

While the world gears up for the raging second wave of the novel Coronavirus, the first wave took away with it over a million people. With 45 million cases worldwide, the COVID-19 has thrown a curve ball to not just epidemiologists, but democracies as well. In a lesser highlighted consequence, it destroyed democratic institutions in its menacing descent.

Even as 89 per cent of the world's population was living in autocratic and semi-autocratic countries,[1] the public health crisis gave the remaining global democracies a final push to the path of becoming autocracies with no hopes of recovery. The already dwindling situation of democracy served as a proper platform for the

pandemic to enable countries' democratically elected leaders to adorn the roles of autocrats and dictators under the garb of "emergency powers". Nobel Laureate Amartya Sen correctly notes that the world today "faces a pandemic of authoritarianism, as well as a pandemic of health, which debilitates human life in distinct but interrelated ways".

During its first phase, COVID-19 left its autocratic footprint across the world. According to COVID-19 State of Emergency Data by UN's Centre for Civil and Political Rights; 84 countries until May 2020 had declared state of emergency due to the pandemic, beginning a gateway to autocracy[2]. In Europe, 42 countries imposed a state of

emergency following the outbreak, of which some countries enforced the period without an end date.[3] For instance, Hungary extended the state of emergency indefinitely with its Prime Minister, Viktor Orbán, allowing himself to rule by decree[4] and Serbia's President Aleksandar Vučić announced an open-ended state of emergency on 15 March 2020, sidelining Parliament and enforcing some of Europe's strictest measures[5]. Down south, a total of 87 per cent of the countries in Latin America and the Caribbean announced emergency owing to the pandemic, wherein one-third of the countries did not specify any end date for restrictions. These include Uruguay, Paraguay, Panama, Jamaica and Honduras. While Argentina weaponised the situation to centralise power under the Executive, postponing elections until October 2020, Bolivia's interim-president (now ousted) resorted to authoritarianism in the emergency period. Chile managed to delay its constitution referendum till 25 October 2020 under the name of "state of catastrophe", which now stands extended till the year end.

Africa had the second largest share of countries decreeing emergency of which 79 per cent of its countries increased their duration. Amongst them, Sierra Leone, in one go, declared a-year-long state of emergency. Gambian President, Adama Barrow sidelining its Parliament further extended the date of expiry.[6] With only 11 countries having declared the pandemic as a crisis, Asia still hosts leaders of governments taking undue advantage of the situation - Philippine Congress accorded emergency powers to its President through legislation[7]. Cambodian legislature had given unprecedented powers to the country's Prime Minister, allowing him to trespass fundamental rights of its citizens.[8] Meanwhile Azerbaijan and Sri Lanka saw their respective Presidents consolidate political power in the first wave.

It is to be noted that declaration of emergency is not problematic per se, as the prevailing situation demands some extreme measures. The worrisome aspect is the unchecked power it bestows on the head of the government, which allows them to push forward their vindictive agenda against dissenting voices, and corrupt the democratic processes that aim to hold them accountable.

The biggest casualty of this concentration of power is human rights. The "subjects" are compelled to surrender their rights in face of "threat", which paves the way for their exploitation. According to the International Institute for Democracy and Electoral Assistance (IDEA).

> 61 per cent of the countries across the globe implemented decisions in guise of curtailing the spread of novel coronavirus, to tamper with basic rights of individuals in particular, and democracy in general.

These patterns were distinctly noticeable in countries that had forgone, or were on the verge of foregoing their commitment, to the fundamental principles of democracy. As per IDEA, 91 per cent of the authoritarian regimes and 83 per cent of the hybrid regimes, (countries that swing between democratic as well as authoritarian form of government) witnessed developments that were "disproportionate, illegal, indefinite or unnecessary" for a health pandemic.[9] Disguised as measures to control the spread of COVID-19, the most common exercise has been a crackdown on freedom of expression - Hungary tampered with the right to freedom of expression with jail term of up to five years, Bolivia penalised 'spreading misinformation' or information causing uncertainty with imprisonment of

upto one year. Pakistan arrested doctors and nurses raising voice against the lack of PPE kits. Argentina's Ministry of Security activated cyber patrolling on social media and Internet., Journalists in Belarus and Azerbaijan were being prosecuted for merely doing their job. The countries didn't limit themselves to penalisation of freedom of expression, they employed censorship at their whims and fancies.

As per Freedom on the Net (2020), minimum 28 countries out of the 65 countries monitored by the organisation latched on to the censuring business. For instance, China deleted several social media posts, ranging up to 2,000, consisting of keywords related to the pandemic on WeChat and live-streaming platform YY. Bangladesh blocked websites of BenarNews and Netra News for reporting on the leaked WHO document about Bangladesh's rising COVID-19 patients and breakdown of healthcare system. Egypt blocked news platforms on the pretext of 'false news'.[10] Such instances back the finding that half of the countries in the world brought in legislation, or measures to curb freedom of speech and expression.

A vital auxiliary to freedom of expression is freedom to assemble peacefully. Owing to the highly contagious nature of the virus, governments continue to dissuade people from crowding public places. However, certain countries relied on punitive measures and muscle power. While Argentina penalised violation of its 'stay in shelter' order with up to two years imprisonment, countries like South Africa sought the assistance of their armed forces to enforce the lockdown. Falling in the second category, Chile found an opportunity in such grievous times to curb mass protests, by having the army patrol the streets due to "emergency".

It would be unfair to say that democracies have been immune to the pandemic of autocratization. More than two out of five democracies had at least one concerning development in relation to democratic principles and human rights. Particularly, democracies were not hesitant in breaching citizen's privacy. The pandemic facilitated governments in strengthening the vigil on citizens, by violating their right to privacy. Even though surveillance of telephonic conversations has been a regular state of affairs in disguise of preventing anti-national activities for a long time now, the idea of "contact tracing" of COVID-19 patients was a perfect opportunity to keep a log of citizens' movements. For example, the inbuilt surveillance app of South Korea kept a track of the smartphone owner's GPS locations, and allowed for personal data exchange with the application. On the other hand, India's Aarogya Setu app, a closed source app which accesses a user's GPS and bluetooth data to track user's movement, for predicting their possible exposure to the virus, was under scanner for its incapability to secure users' data and hiding information on developers of the application. There is no clarity on what happens to the encrypted data saved with the government server once the pandemic is over.

To put this in perspective, Israel, for instance, has decided to use the secretly collected pools of citizen data under its counter-terrorism exercise, for contact tracing of the COVID-19 patients.[11] Other democracies like Belgium ordered cell phone companies to share their tracking data, to monitor people's movements,[12] whereas the United States' federal and local government agencies circumvented "the minimal privacy-oversight mechanisms built into the US law" by asking for location data from mobile advertising industries.[13]

The authoritarian and hybrid regimes were obviously more oblivious to the personal liberty of its people. Russia's Social Monitoring app had access to the user's GPS data, call records and other information. Its erroneous application of sending requests for random selfies to enforce quarantine, led to levying fines on the wrong identical twin, bedridden professor, or people fast asleep at the time of receiving such arbitrary requests. Whereas Saudi Arabia mandated its citizens to use Tetamman app which comes with a bluetooth bracelet, violations of which would amount to two years in prison, or fine, or both.[13]

In normal situations such policy measures would have been subjected to scrutiny by the legislature and judiciary, but the present scenario has effectively neutralised the doctrines of separation of powers and checks and balances. The emergency has helped fragile democracies in bypassing their respective legislatures, to implement legislations without deliberation; striking at the root of democracy. In Hungary, the PM's decrees have automatic approval of its legislative body, which allowed him to take away funding of political parties to "fight the coronavirus". While the Indian government kept the national law making institution, the Parliament, in the dark regarding its decision on nationwide lockdown, even though it was in session till a day before. Sri Lanka on the other hand dissolved its Parliament for six months, prematurely, followed by postponement of its legislative elections.

The executive's instinct to bypass the legislature arises from the ruling party's impulse to rule uninhibited, with no sense of accountability to the opposition. In order to execute this undemocratic vision, certain ruling leaders found an opportunity in the pandemic to harass and intimidate the opposition political

parties and civil society. Such countries include Bangladesh for arresting its opposition political leaders, students and activists for posting about coronavirus on social media under its draconian Digital Security Act,[14] Venezuela for incarcerating and suing political opponents, activists and healthcare workers on criticising the government,[15] and Turkey for utilising the pandemic to further its might by detaining politicians, journalists and ordinary citizens; for critiquing the government's handling of the health crisis.[16]

The third organ of the government, which is expected to be the protector of democracy, the judiciary, has been completely silenced. This was witnessed in Israel, where Prime Minister, Benjamin Netanyahu shut down the country's courts[17]. Strangely, the Israeli PM was to face trials on bribery, fraud and trust breach; a tit for tat? In other countries like Ukraine, the courts have shifted their working to video-conferencing with no public access.

> The COVID-19 pandemic also provided the ruling political parties, in several countries, a peculiar chance to persecute the minority communities.

By way of targeted hate propaganda, or purposely restricted healthcare services, such countries were able to brainwash the entire population against the minorities, effectively aiding their further ghettoisation. Resorting to the former tactic, Sri Lanka and India tarnish the Muslim community for spreading the coronavirus, in their respective countries. While Indian media engaged in name calling members of Tablighi Jamaat as 'corona bombs' and 'corona jihadis', Sri Lanka went a step further to deny Muslims their holy right to

burial, by allowing only cremation, for people who had died of COVID-19. On the other hand, countries in the latter category included Kuwait, which placed stricter restrictions in places resided by non-citizens, and Bulgaria wherein neighbourhoods of the Romani majority faced more severe restraint on movement, than the ones where the community was sparsely present.[18]

Amidst all this chaos, the fate of free and fair elections; one major practice which lies at the core of a successful democracy, were kept hanging. Election is a money and labour intensive task, which derives its legitimacy from large voter participation. Over 100 national and local elections were scheduled for this year, worldwide. As much as these elections were imperative for every nation's political health, the traditional in-person voting method posed a potential health hazard, for the world. These countries were faced with two options - postponing their elections (a route that the United Kingdom and New Zealand took in disastrous world wars), or hold the elections as scheduled, like the USA did in World War I and II.

According to International IDEA, 73 countries and regions have postponed their national and sub-national elections between the period of 21 February, to 1 November 2020. However, amongst this group, many countries didn't postpone their elections indefinitely in the name of pandemic, upholding the system of checks and balances. For instance, New Zealand held its general elections, originally scheduled for 19 September 2020, on 17 October 2020; Sri Lanka had its parliamentary elections on 5 August 2020, after postponing it twice; Chile conducted its much awaited constitutional referendum on 25 October 2020, six months after its actual date; while Bolivia elected its President on 18 October 2020, following two postponements.

The countries that didn't back track from holding elections as per schedule included the United States of America and Taiwan, for their presidential election, India for Bihar state assembly election, South Korea for national legislative election, among others. Together they are part of 80 countries and territories that followed their respective election calendar on time.[19] Regardless of which election time trajectory each country took, it is with certainty that the pandemic has transformed electoral procedures across the globe. While campaigning has flexed into a digital arena with virtual campaigns, and on-ground rallies minimised to limited crowds; the voting day is laden with guidelines of social distancing, usage of hand sanitisers and masks, alternative voting methods ranging from postal ballots to early voting (which had an unprecedented impact on the just concluded the US elections), and presence of mobile voting machines. The two positives the novel coronavirus has resolutely set in motion in the political world are; an active research on alternative voting mechanisms that are voter friendly and implementable during a health or a manmade disaster, and persuading countries to improve available voting facilities.

A cumulation of these wide-ranging consequences of a public health disaster reflect where global democracy is headed. The International IDEA's Global State of Democracy Index perfectly captures it. In 2019, before the dreadful coronavirus took over, the index graded world democracy on four main parameters: Representative Government, Fundamental Rights, Checks on Government and Impartial Administration as 0.55, 0.59, 0.57 and 0.49 respectively. With the ascent of the pandemic, these parameters began displaying concerning developments. The worst hit amongst them is Fundamental Rights, whose all three sub-parameters - Access to Justice,

Civil Liberties and Social Rights and Equality; are under scanner in the global context. This is followed by Representative Government and Checks on Government with two concerning sub-parameters each - Clean Elections, Free Political Parties and Effective Parliament, Media Integrity; respectively.

Amidst the dark dull night sky of autocratisation, there remains a faintly twinkling star struggling to keep traditions of democracy in sight. As in many countries, the government's inactivity and weak response towards the pandemic created a vacuum of efficient governance; the civil society organisations and ordinary citizens stepped in. For example, Tunisia witnessed over 100,000 people coming together through the medium of Facebook as volunteers to fight coronavirus, civil community in Poland is assisting in organising medical supplies,[20] and during the migrant exodus Indian people stepped out to feed the migrant labourers. Pushing back governments' authoritarian tilt, citizens in some countries took their protest to streets in the middle of the pandemic.

These include Black Lives Matter protests in the United States, and protests in Tel Aviv (Israel) against Netanyahu government's anti-democratic measures, among others.[21] Even though such instances spark a ray of hope for democracy's survival, they are sparse and limited due to the presence of COVID-19.

All in all, democratic principles are under attack. Moving away from Locke's 'social contract' and Rousseau's 'general will', democracy now finds itself in Hobbesian state, for people have willingly submitted themselves to the government, in fear of the pandemic. Underlining this, Joseph Cannataci (UN's special rapporteur on right to privacy) has rightly observed, "Dictatorship often starts in the face of a threat".[22] Earlier it was the invisible and distant threat of terrorism that demanded obedience, now it is a threat of pandemic; a fear closer to home, pushing them to give away their rights on the platter. With the virus's second wave welcomed with nationwide lockdowns in European countries, the question is for how long - weeks, months or years?

Photo Source:shutterstock_1675328332

Testing for COVID-19

Background

With the major advancements in the medical field in past few decades, diagnostics has emerged as one of the most significant aspect of managing the ever evolving diseases. Proper diagnosis of disease is as important as its subsequent treatment. The importance of various diagnostic techniques is widely witnessed in the prevalent communicable and non-communicable diseases. In the case of infectious diseases, proper diagnosis in the form of various tests helps not only in ensuring proper treatment, but also controlling the spread of infection in the population.

In an emergency situation such as the current COVID-19 outbreak, the scale and spread of the disease can only be assessed by knowing the proportion of population getting infected with the pathogen. Until and unless one does not know who is suffering from the infection, proper treatment cannot be provided to them. For instance, many of the symptoms for COVID-19 are similar to flu, which is less severe in terms of mortality and morbidity. We have to ascertain that all the people showing these symptoms, are tested for the presence of SARS-CoV-2. Once it is established through proper testing that the person is positive for COVID-19, they can be isolated and proper treatment can be given. This is one of the ways that prove testing is important, to provide proper care to the confirmed cases with COVID-19 symptoms.

But the utility and importance of testing is not just restricted to this. COVID-19 is a contagious

disease, and it spreads from person to person. In most of the cases, the infected persons do not show any symptoms at all, but still they spread the virus and infect other people. In that case, if any country wishes to contain the spread of the disease, then they have to test as many people in their country as possible. If the testing is restricted to symptomatic patients only, then a large fraction of population which is asymptomatic will be missed out on. Testing is the only tool that helps the Government in gauging the extent of the outbreak. Without proper and widespread testing, the number of confirmed cases will be limited to the symptomatic patients only, and this will not give a clear picture of the spread of the infection.

Recognising the importance of testing, World Health Organisation has been continuously pressing on the need for extensive testing. In the initial phase of pandemic itself, WHO Director General Dr. Tedros Adhanom Ghebreyesus in his address to all the countries of the world has said that "We have a simple message to all countries - test, test, test." He added, "Without testing we will not be able to isolate the COVID-19 positives and the chain of infection cannot be broken." Therefore, the scale of testing is also being considered as a parameter on how well a country is performing in managing the outbreak.

COVID-19 Testing Methods

There are a number of testing methods used for detection of viruses such as coronavirus. Ever since the COVID-19 outbreak, companies and academic institutes all around the world are working tirelessly to develop various methods of testing, which are more efficient in results and at the same time economical. But two types of tests are being employed in almost all the countries of the world to detect

presence of SARS-CoV-2 are[1]:
1. Reverse Transcription- Polymerase Chain Reaction (RT-PCR) test
2. Serological test

Apart from these tests, some countries like India are widely employing Rapid Antigen Detection Tests for preliminary detection of COVID-19.

Here is the brief account of various types of tests:

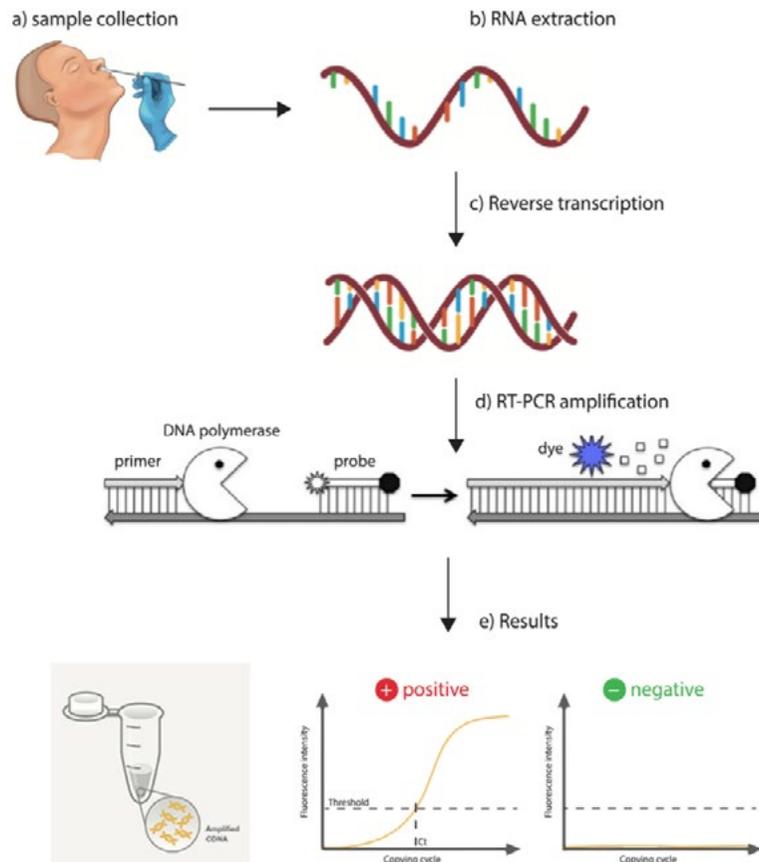## 1. Reverse Transcription- Polymerase Chain Reaction (RT-PCR) test

RT-PCR is the gold-standard test for detection of SARS-CoV-2 in the humans. WHO has directed the countries to choose this method of testing, for detection of SARS-CoV-2 in the population. Among all the diagnostic methods available, RT-PCR is the most efficient method to detect the viruses. It can detect the virus, even if the number of virus particles are very less in the sample. This method has high specificity and sensitivity in comparison to any of the other methods. Some of the limitations of this technique are:

It can detect only acute infection, and cannot tell if the person has been infected with the virus in the past. (ii) It requires highly trained professional to perform this technique. (iii) It needs high throughput lab with highly sophisticated instruments. (iv) It is expensive.

2. Serological Tests

Serological tests for COVID-19 identify the antibodies against SARS-CoV-2 virus. Therefore, these tests are also referred as antibody test. For the serological test, the blood sample of the person to be tested

The general protocol for conducting the RT-PCR test is illustrated in Figure 1.

a) sample collection

b) RNA extraction

c) Reverse transcription

d) RT-PCR amplification

DNA polymerase

primer

probe

dye

e) Results

⊕ positive

⊖ negative

Fluorescence intensity

Threshold

Copying cycle

Amplified cDNA

is taken. Whenever a virus infects the body, the immune system activates and generates immune response to protect the body from infection. The incoming pathogen is referred to as antigen. In its response, the body produces antibodies, which binds to the antigen and eliminate it. These antibodies remain in the blood either for a very long time, or they can be short lived depending on the type of antigen. In the case of COVID-19, research has shown that the antibodies are produced in the body after 1-2 weeks of occurrence of symptoms, and can remain in blood for at least four weeks[23]. If a person has had a SARS-CoV-2 infection, whether

they are symptomatic or asymptomatic, their blood sample will show positive result for serological test. As the detectable amount of antibodies are generated in the body only after 1-2 weeks of onset of symptoms, the serological test are not useful to detect infection in early stages, but they are very useful for surveillance purposes.

3. Rapid Antigen Detection Test

Rapid Antigen Detection Test (RAT) is a chromatographic immunoassay and serves in point-of-care detection of acute COVID-19 disease. This test makes use of antibodies against SARS-CoV-2 virus

immobilised on the surface. The test sample is taken from nasopharyngeal area with the help of a swab, and is dissolved in the extraction buffer. Once the sample is dissolved in the extraction buffer, it is added to the sample well of lateral flow kit. The appearance of coloured band in the test line of the kit indicates the presence of COVID-19 antigen in the sample. The tests results can be seen in merely 15-30 minutes and usually can be interpreted through naked eyes. The validation studies of the available kits indicate that this technique had good specificity, but relatively low sensitivity. This means that positive tests from this technique can be considered conclusive, but the negative results should be confirmed by subjecting the samples to other technique with higher sensitivity (such as RT-PCR).

Acknowledging the importance of RAT in low income settings, WHO has partnered with a number of international organisations and targeted to provide 120 million rapid antigen test kits to low and middle income countries. By September, USA's Food and Drug Administration (FDA) have authorised the use of four RATs in their country. Japan has approved two kits for rapid detection of antigen[4]. A rapid antigen test by Becton Dickinson and Co. has got clearance for use in Europe at the end of September 2020, and will be in use by the end of October 2020[5]. India is among the first countries to widely introduce the RATs for COVID-19 testing. Other South Asian countries like Bangladesh and Nepal have also started using antigen based rapid-testing at their health facilities in the month of September and October, respectively. This is an indication that slowly the world is moving towards greater use of Rapid point-of-care tests.

Approaches of Different Countries for COVID-19 Testing

After the emergence of first reports of COVID-19 outbreak in Wuhan in the month of December 2019, this disease has taken the form of pandemic and has impacted almost all the countries on the planet. Even after nine months of being into the pandemic, many countries continue to experience the surge of this deadly disease. The rate of testing varied significantly among the countries across the world (Figure 2). It can be ascertained from the data that the countries who have used testing as an important tool, were able to manage the outbreak in a better way. In fact, some countries such as South Korea, New Zealand, Taiwan and Germany with aggressive testing strategy in the initial phase itself, not only successfully flattened the curve, but also approached to become free of COVID-19 within few months of getting their first infection. These countries emerged as a model on how testing can help in containing this deadly virus.

Here is a brief account of the approaches of the countries who have used testing as an important tool to contain the COVID-19 disease:

South Korea reported its first COVID-19 case on 20 January 2020 and reached its peak of 909 daily cases by 29th February. By the end of February, South Korea was the most affected country in the world after China. It was appearing that South Korea was on the path of witnessing the catastrophe of COVID-19. But suddenly after that, the country saw a decline in number of daily cases. In a month's time, the daily number of cases of COVID-19 have come down substantially. A time came, on 30th of April, 2020 when there was not a single case of local infection reported in the entire country [6]. The administration was in good control of the

Testing rates in different countries of the world as by Oct 30, 2020

Total COVID-19 tests per 1,000 people, Oct 30, 2020

The figures shown relate to the closest date for which we have data, with a maximum of 10 days' difference.

Our World in Data

No data   0   1   2   5   10   15   20   40   100   >150
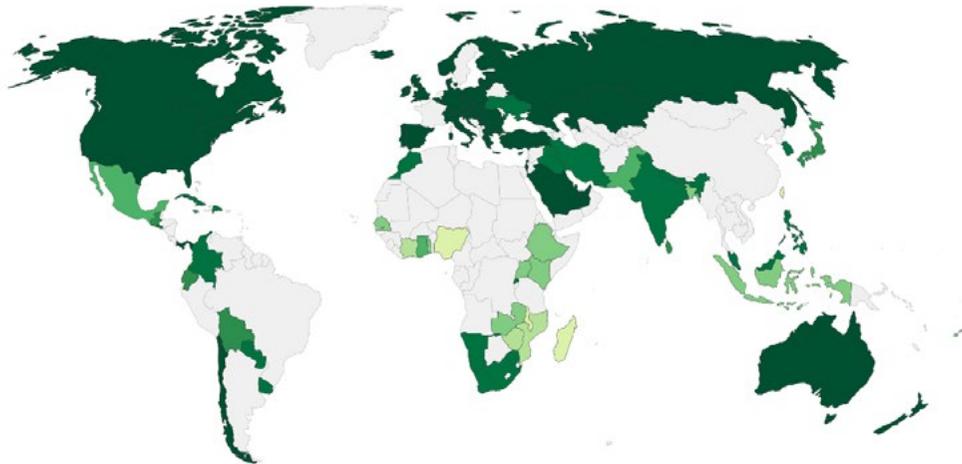
Source: Official sources collated by Our World in Data

Note: Comparisons of testing data across countries are affected by differences in the way the data are reported. Details can be found at our Testing Dataset page.

OurWorldInData.org/coronavirus • CC BY

(Source: Our World in Data)

situation and South Korea also managed to conduct the parliamentary elections in the first half of April 2020.

The question now arises, what did South Korea do to tackle this outbreak successfully, even after not having imposed any proper/ strict lock down for a single day? The answer to this question is that they have done excessive testing, tracing and isolation of confirmed cases. South Korea adopted the most aggressive approach for testing of COVID-19, which turned out to be the key to South Korea's approach to contain the deadly COVID-19 virus. While most of the countries waited for long to start widespread testing, South Korea had started testing its citizens on a massive scale, right from the beginning [7]. The success of South Korea's strategy can be owed to their learnings and experiences from

the MERS outbreak five years back [8]. From the MERS outbreak, the Koreans have learned the importance of early and widespread testing to contain the virus. After the identification of first case in the latter half of January 2020, the Government ordered the biologicals companies to develop coronavirus testing kits on mass scale. As all the testing kits were indigenously developed, South Korea was not dependent on other countries for the kits and that was the reason the kits were readily available. This, otherwise was a constraint for most of the countries in the world. By the mid-March, when the WHO was urging the countries of the world to 'test, test, test', South Korea was already doing that. There were no restrictions on testing and anyone who wanted, could get tested. The Korean Government was covering the cost of testing of the symptomatic persons, and close contacts of COVID-19 positive

patients. But anyone could avail the testing facility by paying an amount of 150,000 KRW, and this expenditure was to be reimbursed from the nation's single-payer health care [9]. According to Government figures on 5 March 2020, the tally of total people tested in South Korea was 145,000 which was greater than the total number of tests done by the USA, the United Kingdom, Italy, France and Japan combined during that period. By mid-March, this number rose to more than 270,000 tests [10].

To keep the hospitals and public health facilities free of such massive testing burden, the South Korean Government took a very innovative action. Inspired by the drive-through fast food counters, the Government established drive-through testing centres (Figure 3). Similar to the drive-through centres, several walk-in booths were also established. These booths were also designed to ensure minimum exposure to the health worker.

Along with extensive testing, the other thing which South Korea has exceptionally done is contact tracing of positive cases. Along with the conventional method of interviewing the confirmed patient, the Korea's Centres for Disease Control and Prevention (KCDC) personnel closely look into their movements in recent past with the help of mobile phone tracking, credit card transaction history, video footages etc. Through these efforts, the officials can identify the potential COVID-19 patient and can test and quarantine them. The Government also released the movement history of the confirmed patients to the general public, so that they could be cautious while visiting those places [11]. Apart from this, the strict quarantine measures, discipline and sincerity of the common public by following the precautionary measures of staying at home, social distancing, use of mask, frequent hand washing etc. made South Korea the pioneer in COVID-19 containment.

Other countries who have employed testing as an effective strategy in COVID-19 control are New Zealand, Taiwan and Singapore. New Zealand is a small country with the population of around 5 million. It declared itself COVID-19

A drive-through testing facility in South Korea

free on 8 June 2020. Apart from imposing strict lockdown, New Zealand has focused on extensive testing and tracing. New Zealand has one of the highest rates of tests per million of population. As on 27 May 2020, the New Zealand tested 247,295 individuals which accounts for 50 individuals per 1000 population which was one of the highest in world [12]. Similar is the case with Taiwan, a country located near mainland China. Due to its geographical proximity with China, it was considered as a high risk nation. But Taiwan managed to keep its daily number of new confirmed cases under 31 throughout the outbreak [13]. Even after the eight months of detection of first case, the cumulative number of confirmed cases is merely 514 with not a single COVID-19 case reported in most of days after April. Testing and tracing model of Taiwan is the key for this success. Taiwan has expanded its testing and surveillance with the increase in the epidemic. The country has carried out re-testing of the high risk individuals who have been tested negative once. Rigorous testing has been done, which includes people with symptoms of influenza, or upper respiratory tract infection. The testing and tracing strategy of Taiwan can be a lesson for many countries dealing with COVID-19 [14].

Impact of Lack of Testing on COVID-19 Outbreak in Various Countries

Though the WHO has been advising on the importance of testing, in controlling the pandemic from the very beginning itself, some countries have not paid much attention to it due to some reasons or other. Countries like the USA, Italy and the UK failed to conduct aggressive testing and tracing in the initial phase of the outbreak, and they have had to pay for this with severe consequences. Currently, the USA is the most affected country

with the ongoing COVID-19 pandemic. As on 30 October 2020, the USA has more than 9,000,000 confirmed cases, and 229,696 deaths [15]. One of the main reason for this situation is that the Government failed to carry out the testing of its citizens in adequate numbers from the beginning itself [16]. After the detection of first case of COVID-19 in USA on 21 January 2020, the speed of testing wasn't up to the mark, due to the shortage of test kits, reagents etc., until mid March 2020. Though after almost five months into the outbreak, the US started conducting the highest number of tests per thousand population, and the situation looked bleak. Due to negligence in the initial months, the infection spread to most parts of the country, and it appeared an uphill task to manage it. Though some experts still believe that the scale of testing in US is still not up to the mark [17].

Similar is the case with countries like United Kingdom and Italy who have seen the most appalling form of COVID-19. By the end of June, United Kingdom was approaching the 300,000 COVID-19 cases whereas Italy had 240,000 cases. Just like USA, Italy has also committed the mistake of not taking testing seriously, before April 2020. Though the UK had started testing and contact tracing in early March 2020, but it failed to keep pace with the extent of the outbreak. The policy of testing only symptomatic patients was not helping much. In early April 2020 in the UK, approximately 40 per cent of tested people were found positive for COVID-19 infection, which meant that the infection was widespread, and it required extensive testing of asymptomatic persons also, which unfortunately did not happen.

The importance of testing can be ascertained by the fact that the USA, the UK, Italy and South Korea have reported their first COVID-19 cases

at approximately same time, in late January 2020. On one hand where South Korea flattened its curve in the month of April 2020 itself, the USA, the UK and Italy have struggled to control the spread of the virus for many months. Though with time, the situation of the UK and Italy has improved a lot, but for the USA there has been no improvement in the last eight months. Though the testing in the US has eventually increased, but so has the outbreak. Though the UK started the testing early, but its inability to scale up the testing in synchronisation with the outbreak, prevented it from overcoming the outbreak in the initial stage. The UK took almost five months to reduce the number of daily confirmed cases to three digit.

The figure below depicts how testing and tracing efforts helped South Korea in controlling the outbreak, whereas the USA, the UK and Italy were still struggling, though the outbreak took place in all these countries, at almost the same time. Countries like Brazil, which have emerged among the top three most affected countries are also not performing well on the testing front and this could be one of the reasons for such a large scale of outbreak in the country.

Apart from these countries, another European country, Sweden has demonstrated a model for containment of COVID-19, which according to many experts, no country would like to

Comparison of daily tests versus daily new confirmed cases in South Korea, USA, UK and Italy till May 2020 to show how testing at initial stage helped South Korea in containing the outbreak
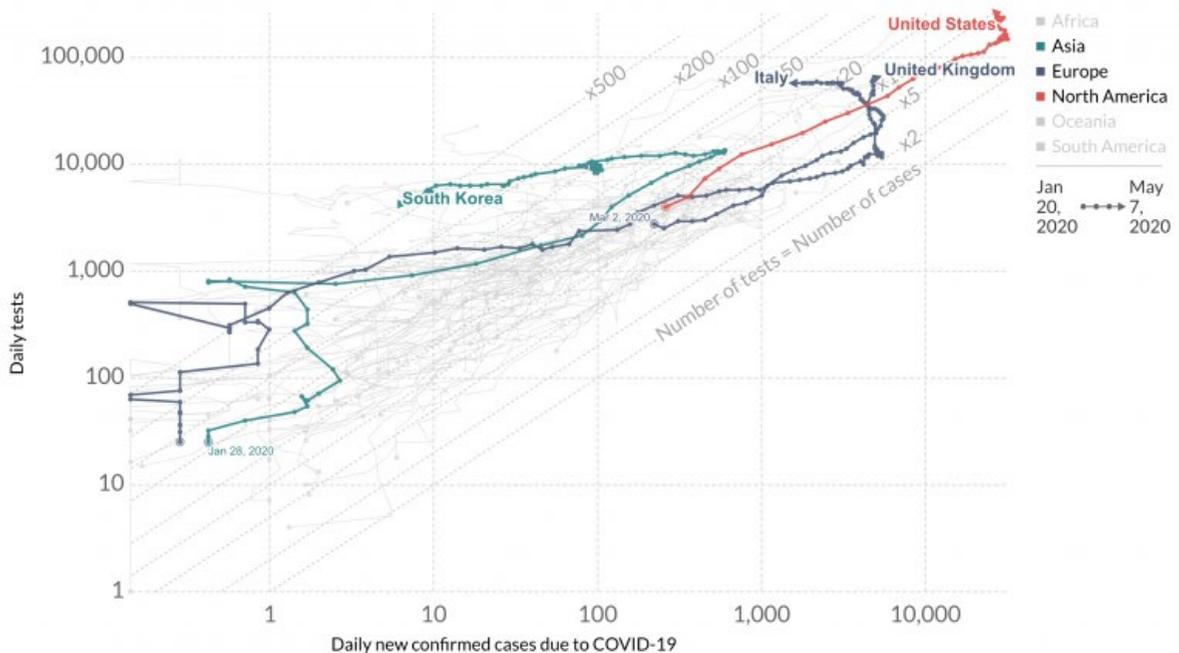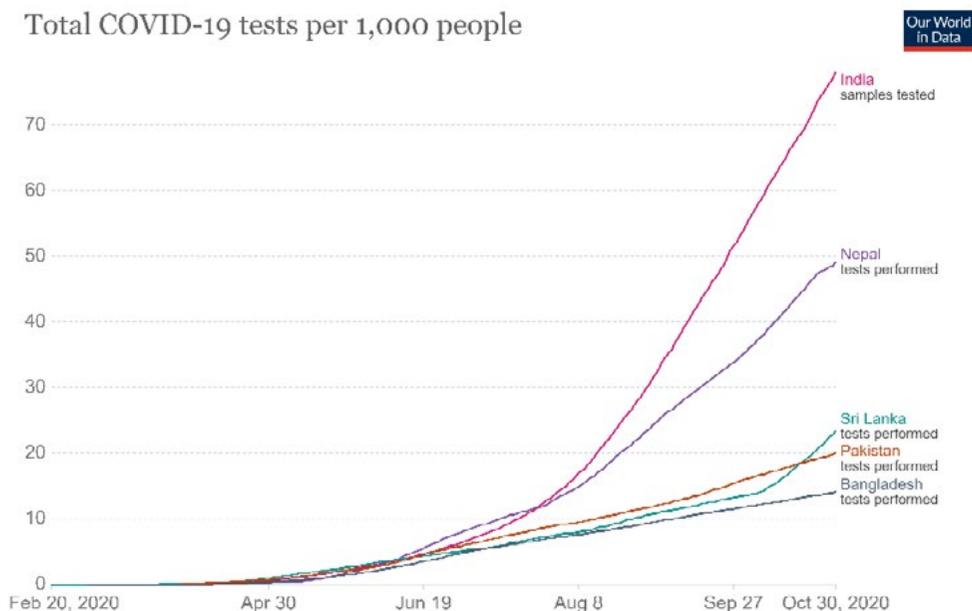

(Source: Our World in Data)

replicate. Sweden's model relied completely on achieving the herd immunity, instead of containing the virus with lockdowns or the scientific strategy of testing, tracing and treatment. Sweden did not implement testing as required, till many months after the onset of the outbreak and remains among the countries with lowest testing rates [18]. Till May 2020, testing was restricted to only the healthcare workers, or people coming from high risk zones. This put Sweden in the list of European countries with highest number of COVID-19 deaths. With increasing number of cases and deaths, Sweden has increased testing, and is resorting to some restrictions as well.

Status of COVID-19 Testing in South Asian Countries

Testing remains a concern in almost all the South Asian countries like India, Pakistan, Nepal, Sri Lanka and Bangladesh. Though India has achieved a feat of more than 1 million tests per day in August, but still experts believe that this needs to improve further. The condition of countries like Pakistan, Nepal, Bangladesh and Sri Lanka is much grave than India, as far as testing numbers is concerned. As on 30 October 2020, when India was doing almost 78 tests per 1000 population, the testing rates of Nepal, Sri Lanka, Pakistan and Bangladesh were 49, 23, 20 and 14 tests per 1000, respectively (Figure 5). WHO has set the benchmark range of 10 to 30 tests per confirmed cases. But Nepal and Bangladesh have not even been touching this benchmark of adequate testing [19]. Although with the increase in availability of cheap and affordable rapid antigen test kits, the testing rates are expected to increase in these countries.

Testing Rates in South Asian Countries of India, Pakistan, Nepal, Bangladesh and Sri Lanka

(Source: Our World in Data)

Testing to Combat the Second Wave of COVID-19 Outbreaks

It was predicted earlier by the epidemiologists that there were high chances of a second wave of the COVID-19 outbreak in the countries which had already seen a peak, and controlled the infection. This phenomenon was observed in many countries. Countries like South Korea were among the first to declare that they were facing the second wave, in the latter half of June 2020. The country overcame the first wave until April 2020, through their rigorous testing and tracing strategy [20]. Similarly, several countries in Europe including the UK, Czech Republic, Spain, France, and Netherlands also faced the second wave of the COVID-19 pandemic. Some countries like France and Netherlands have even reported their highest single day figures, on approaching the end of September 2020. Experts believe that these high numbers may be attributed in increase in testing capacity of the countries, which was lacking during the first wave of the outbreak. As of now, all the countries have understood the importance of testing and tracing during the course of their first wave. Therefore, it is expected that they will thoroughly implement the principle of testing, tracing and isolating the individuals to overcome the outbreak.

Conclusion

As we progressed through the pandemic, it became more and more evident that testing is crucial in controlling the spread of the disease. South Korea's model which relied on extensive testing and advanced hi-tech tracing system, is being considered as one of the best model to contain the COVID-19 epidemic. The testing, tracing and isolation of positive cases have controlled the spread of COVID-19, and also minimised the burden on their health system. Along with testing, the good practices of hand-washing, social distancing, and usage of masks, which South Koreans religiously followed has also helped.

It would not be superlative to say that, testing has played an important role in containment of the COVID-19 diseases in countries such as New Zealand, Germany, Taiwan and Singapore also. One may argue that the population of New Zealand and Taiwan is comparatively very less in comparison to countries like India, the USA, the UK etc. therefore, it is easier to implement such measures. But as we know that every big country is divided into states or provinces, and if each state is considered equivalent to a small country, the model of the small countries can be at least implemented at the state level. During the course of the pandemic, many countries resorted to shutting down the country to contain the virus, but it proved not to be a long term, feasible option. A large number of studies have showed that as long as vaccines are not available, or herd immunity against the virus has not been achieved; testing, tracing and isolation of positive people is the key to combat the virus. This becomes even more important when on the one hand, some countries like India and the USA are still under the first wave of the outbreak, countries like South Korea and the UK are going through the second wave of the infection. But while ramping the testing capacity, the countries should be equally mindful of strengthening the RT-PCR testing, and should not rely only on rapid tests. Also, WHO and first world countries should be more considerate towards the underdeveloped countries, and ensure that these countries have ample resources to test their citizens.

In a nutshell, it is evident that if we wish to overcome this deadly disease, all the nations of the world need to focus on the major formula of containing the outbreak, i.e. 'Test, Test, Test'.

Photo Source: Jacob King-PA Wire/Bloomberg/Getty Images

Global Collaborative Efforts on Development of Vaccines and Drugs

Coronavirus Vaccine Candidates: A Ray of Hope

With the persisting global devastation of COVID-19, researchers worldwide are moving at a rapid pace to identify and develop viable vaccine candidates.The worldwide endeavour to create a safe and effective COVID-19 vaccine is beginning to bear fruit. A handful of vaccines now have been authorised around the globe; while many more remain in development.

The largest proportion of vaccine trials are currently in planned status, with Phase I studies (42.7%), holding the largest proportion of trials. In terms of ongoing vaccine trials, Phase II studies have the largest proportion of vaccine trials that are in ongoing status (15.1%), followed by Phase III (12.5%) and Phase I (7.9%). Almost all Phase IV COVID-19 vaccine trials utilise the BCG vaccine. At present, no COVID-19 vaccine clinical trials has been terminated.

Only 2.9% of COVID-19 vaccine trials have been completed, which highlights the importance of interim results being reported by sponsors to proceed to later stages of development. Where site locations are concerned, the US takes the lead (11.8%), narrowly outnumbering second-place China (11.0%) and third-
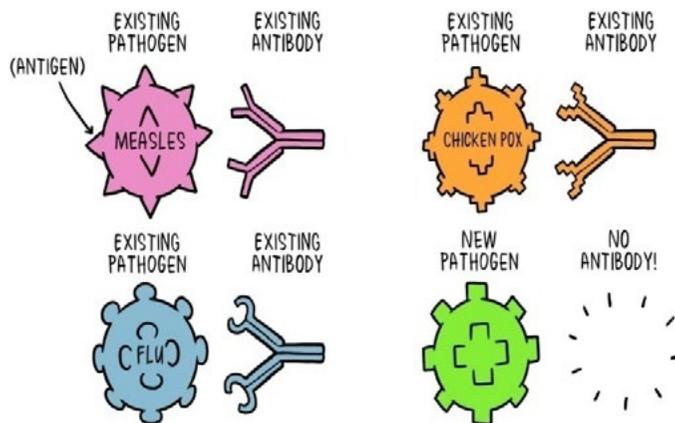
place India (9.7%). There are no European countries within the top five, potentially suggesting a prioritisation of therapeutics ahead of vaccines.

In regard to COVID-19 vaccine targets, the spike protein (S-protein) is the most frequently utilised target site. This can be attributed to the fact that the surface of the COVID-19 molecule is covered with S-proteins, allowing it to attach to host cell receptors; leading to the viral entry into the host cell. This results in the fusion of the viral and host cell membrane; causing the host cell to become infected. The prevention of the S-protein binding to the host cell may therefore prevent infection.


When a new pathogen or disease enters our body, it introduces a new antigen. For every new antigen, our body needs to build a specific antibody that can grab onto the antigen and defeat the pathogen.

Vaccines safely deliver specific immunogenic for specific disease condition, or a specific type of antigen that provokes an immune response, to train the immune system to recognise the pathogen, when it is encountered naturally through memory cells. When a population in community gets vaccinated against any disease, the ability of the pathogen to spread is prevented. This is called 'herd' or 'indirect' or 'population' immunity. When many people have the immunity against a certain disease, it indirectly protects people who cannot be vaccinated, such as a new born, and those who have a compromised health system.

Working of a Vaccine

Vaccinations are the agent-specific administration, but comparatively harmless antigenic components. When vaccinated; the individuals can induce protective immunity against the relevant infectious agent. In practice, the terms "vaccination" and "immunisation" are interchangeable. Vaccines are specific and effective method of prevention and control of certain infectious diseases. Vaccines are mostly safe, and serious adverse reactions rarely happen. Routine vaccination programmes protect most of the children worldwide from large number of infectious diseases that may have caused millions of deaths in previous years.

Vaccines contain inactive portion of a defined antigen that initiates an immune cascade within the host. They can also contain the blueprint for producing antigens instead of the antigen itself, so that the host will produce the antigen. Regardless of whether the vaccine is made up of the antigen itself, or from the blueprint, this inactive version will not cause the disease in the host individual, but it will help regulate their immune cascade, to respond much. As it would have on its first reaction to the actual pathogen.

Vaccines can be of various types: **inactivated, attenuated, toxoid, subunit and conjugate**.

Figure: Process of Vaccine Development
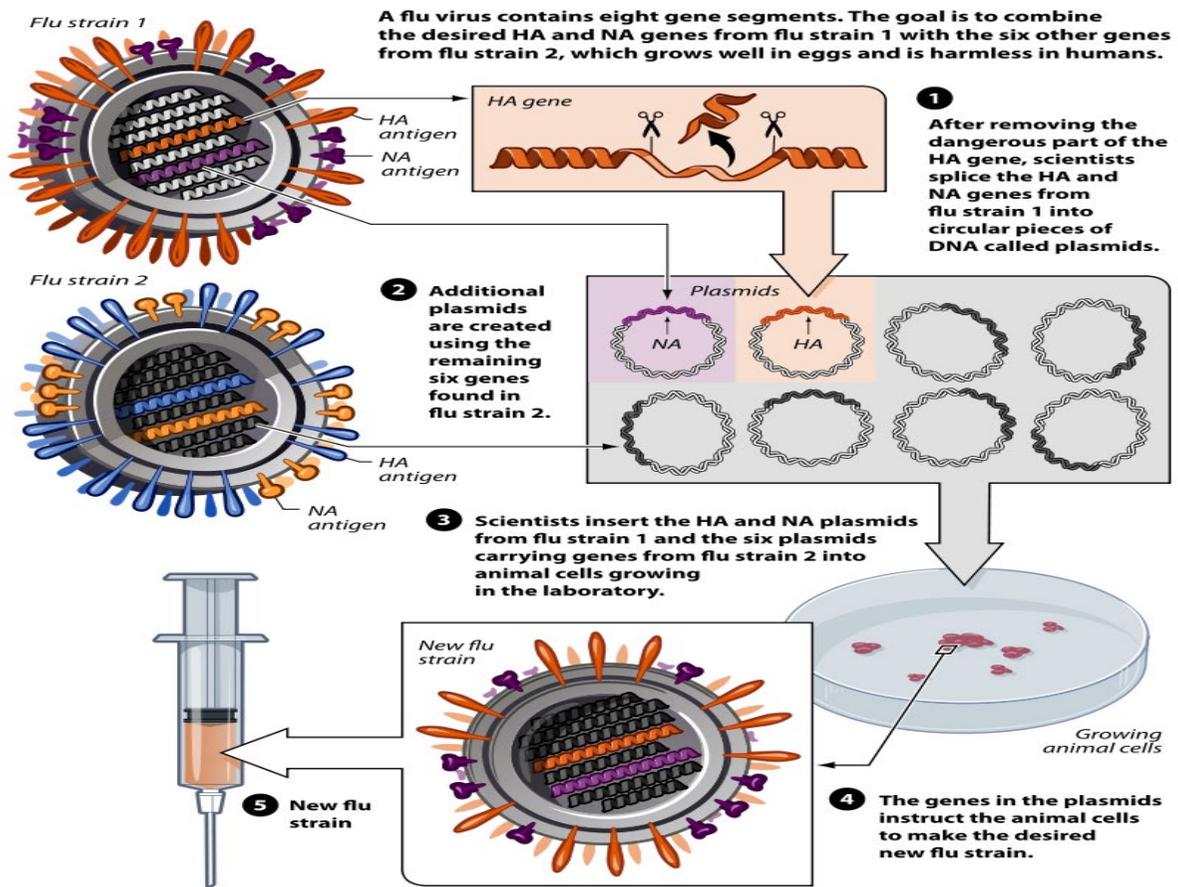
Role of Vaccines in Controlling Pandemics in the Past

The Influenza pandemic in 1918-19 claimed lives of an estimated 40-70 million people globally. Thereafter, less severe pandemic influenzas emerged during 1957-58, 1968, and 2009. In the last three cases, scientists developed influenza vaccines targeted specifically to the virus; but few researchers' debate on how the vaccines curtailed disease spread. Bird flu, an H5N1 influenza which mainly affects poultry, began to infect humans in 2003 and was highly fatal; but the virus did not adapt to spread among the population. The US Government has stockpiled an H5N1 vaccine, though it is not certain that the vaccine will be effective against new forms of H5N1.

COVID-19 Vaccine Candidates in Phase III Trials

As of 2 December 2020, there were 42 COVID-19 candidate vaccines in clinical evaluation, of which 10 were being reported in Phase III trials. 151 more candidate vaccines in pre-clinical evaluation have been documented. As per the protocol, Phase III trials require at least 30,000 or more participants. All top candidate vaccines are to be administered as intra-muscular injection. Most are designed for a two-dose schedule (exceptions with a * in table below are single dose).

Table: Draft Landscape of COVID-19 Candidate Vaccines as of 10 December 2020		
DEVELOPER/MANUFACTURER	TYPE OF CANDIDATE VACCINES	LOCATION
Sinovac	Inactivated virus	Brazil
Wuhan Institute of Biological Products / Sinopharm	Inactivated virus	United Arab Emirates
Beijing Institute of Biological Products / Sinopharm	Inactivated virus	China
Anhui Zhifei Longcom Biopharmaceutical/Institute of Microbiology, Chinese Academy of Sciences	Adjuvanted recombinant protein (RBD-Dimer) expressed in CHO cells	China
Bharat Biotech	Whole-Virion Inactivated	India
University of Oxford / AstraZeneca	Viral vector	United States of America
CanSino Biological Inc. / Beijing Institute of Biotechnology	Viral vector	Pakistan
Gamaleya Research Institute	Viral vector	Russia
Janssen Pharmaceutical Companies	Viral vector	USA, Brazil, Colombia, Peru, Mexico, Philippines, South Africa
Novavax	Protein subunit	The United Kingdom
Moderna / NIAID	RNA	USA
BioNTech / Fosun Pharma / Pfizer	RNA	USA, Argentina, Brazil

Source: The WHO

COVID-19 Vaccine- Global Scenario

1. Pfizer Inc-BioNTech: Pfizer and BioNTech have claimed that their mRNA-based vaccine candidate, BNT162b2is showing over 90 per cent efficacy in preventing COVID-19 in those who have not contracted the infection. According to the data published from Pfizer and the German firm BioNTech's late-stage vaccine trial, the results were analysed on the basis of the first interim efficacy analysis performed by an external and independent Data Monitoring Committee, of the phase III clinical study.

After discussion with the FDA, the companies recently elected to drop the 32-case interim analysis and conduct the first interim analysis at a minimum of 62 cases. Upon the conclusion of those discussions, the evaluable case count reached 94 and the DMC performed its first analysis on all cases. The case split between vaccinated individuals and those who received the placeb, indicating a vaccine efficacy rate above 90 per cent, at 7 days after the second dose. This means that protection is achieved 28 days after the initiation of the vaccination, which consists of a 2-dose schedule. As the study continues, the final vaccine efficacy percentage may vary. The DMC has not reported any serious safety concerns and

recommends that the study continue to collect additional safety and efficacy data as planned. The Phase 3 clinical trial of BNT162b2 began on 27 July 2020 and had enrolled 43,538 participants to date; 38,955 of whom have received a second dose of the vaccine as candidates, as of 8 November 2020. The trial is continuing to enrol and is expected to continue through the final analysis, when a total of 164 confirmed COVID-19 cases have accrued. The study also will evaluate the potential for the vaccine candidate to provide protection against COVID-19 in those who have had prior exposure to SARS-CoV-2, as well as vaccine prevention against severe COVID-19 disease. In addition to the primary efficacy endpoints evaluating confirmed COVID-19 cases accruing from 7 days after the second dose, the final analysis now will include, with the approval of the FDA, new secondary endpoints evaluating efficacy based on cases accruing 14 days, after the second dose as well.

Recently, the FDA approved Pfizer vaccine for emergency use in US. The agency announced that the approval was a "significant milestone" in this pandemic. This vaccine offers up to 95 per cent protection against COVID-19, and is approved as safe as well as effective by the FDA.

2. AstraZeneca PLC: AstraZeneca PLC is a renowned British-Swedish multinational and bio-pharmaceutical company having a promising portfolio of manufacturing for major disease areas including cancer, respiratory, cardiovascular, gastrointestinal, neuroscience. In July 2020, AstraZeneca partnered with a clinical research company, IQVIA to boost the U.S. clinical trials on its potential COVID-19 vaccine.

AstraZeneca's AZD1222 COVID-19 vaccine uses a replication-deficient chimpanzee viral vector, based on a weakened version of non-human adenovirus (common cold virus) that leads to infections in chimpanzees, and carries the genetic material of the SARS-CoV-2 virus spike protein. After vaccination, the spike protein is produced, stimulating the immune cascade to engulf the SARS-CoV-2 virus, if it infects the body in the future.

A feasible method to improve its efficacy is to add a second booster dose, using a different vaccine technique. With adenovirus-vectored vaccines, more than two doses in a lifetime could lead to neutralisation of antibodies in the immune cascade. Perhaps, AZD1222 vaccine carrying just SARS-CoV-2's spike protein may not be suitable. Phase III trials are currently underway in the UK, South Africa, and Brazil with an agreement with the UK, US, Europe's Inclusive Vaccines Alliance, the Coalition for Epidemic Preparedness, Gavi the Vaccine Alliance, and Serum Institute of India to supply more than two billion doses of the vaccine.

3. Moderna Inc.: Moderna Inc. is an American biotechnology company which deals with drug discovery and development, and vaccine technologies specifically on messenger RNA (mRNA). Moderna announced the development of mRNA (mRNA – 1273) against Novel Coronavirus. Moderna Inc has begun Phase III trials of its mRNA-1273 vaccine which includes 30,000 human volunteers. The vaccine contains mRNA, a synthetic form of genetic material from the virus, engineered to push the body's immune cascade into defence mode. Phase I results have shown the vaccine is safe and elicits the immune responses in 45 systemically healthy volunteers.

Data of Phase III trials to determine the safety and efficacy of the vaccine has started coming in since November 2020, and the vaccine is/was? expected to be released by the end of December 2020.

The US Government is promoting Moderna's vaccine with nearly half a billion dollars. Further, the firm has signed an agreement with drug maker Catalent Inc to make an initial 100 million doses. An agreement has also been signed with Spain's Laboratorios Farmaceuticos Rovi SA, Swiss contract drug maker Lonza Group AG and the Israel Government.

4. CanSino Biological Inc.: CanSino Biologics was established in 2009 in Tianjin by Yu Xuefeng, Zhu Tao, Qiu Dongxu and Helen Mao Huihua. The Ad5-vectored COVID-19 vaccine was developed by the Beijing Institute of Biotechnology (Beijing, China) and CanSino Biologics. The placebo contained the vaccine excipients only, with no viral particles. Cellular immune responses before the immunisation, and 28 days after the immunisation were also measured. Ad5-nCoV uses human adenovirus types 5 (Ad5) and 26 (Ad26), a modified version of adenovirus that carries the genetic material from the new coronavirus into the human body, but the disadvantage is that many people may have a pre-existing neutralising antibody against the vector which eventually suppresses the efficacy of a potential vaccine. Study revealed that the Ad5-vectored COVID-19 vaccine is safe upto 5×10^{10} viral particles, and triggers significant immune cascade in the majority of recipients after a single immunisation.

5. Johnson & Johnson: The US pharmaceutical major Johnson & Johnson, which is developing a single shot vaccine, resumed late-stage

trials of JNJ-78436735 in the US. Recently it revealed that the first slot of its candidate could be available for emergency use as soon as January, 2021. Initial results of the 60,000-person study are expected to be analysed by the end of 2020. Till October 2020, trials for Johnson's vaccine candidate, which uses a modified adenovirus like the Oxford shot, were put on pause after a participant developed an "unexplained illness".

Milestone Action

China took the first steps in developing vaccines for the Coronavirus. The first Ad5-vectored COVID-19 vaccine was developed by the Beijing Institute of Biotechnology (Beijing, China) and CanSino Biologics. Sinopharm, a pharmaceutical company in Beijing, is developing two vaccines containing particles of the Coronavirus that have been inactivated so that they can no longer cause the disease (life time protection). The company released a statement in June 2020 that both vaccines had produced antibodies in all participants in preliminary phase I and II trials. Similarly, Beijing-based Company, Sinovac has announced promising interpretations for its own inactivated-virus vaccine.

Recently, Sinovac launched a phase III trial of its vaccine in Brazil. Sinopharm has planned to test its inactivated vaccines in the United Arab Emirates (UAE). Only three other Coronavirus vaccines have entered to phase III trials: one produced by biotech company, Moderna in Cambridge, Massachusetts; one by the University of Oxford and drug manufacturer AstraZeneca, based in Cambridge, UK; and one by biotech company BioNTech of Mainz, Germany, in close coordination with New York City-based drug firm Pfizer.

But few viruses get more potent when they come in contact with host, and infect organisms previously administered with inactivated vaccines, in a rarely considered phenomenon reported as antibody-dependent enhancement (ADE). This was reported last year in monkeys who were given a vaccine for the Coronavirus that causes severe acute respiratory syndrome (SARS). Sinovac says its COVID-19 vaccine did not trigger ADE in monkeys, but the risk will be closely analysed during all the inactivated-vaccine phase III trials. Beijing-based Sinovac Life Sciences Co-announced that its COVID-19 vaccine in collaboration with Brazilian immunobiologic producer, Instituto Butantan has received approval from the Brazilian regulator for phase III clinical trials.

The Brazilian National Regulatory Agency, Anvisa, granted approval to a phase III clinical trial sponsored by Institute Butantan too analysed the potency and biocompatibility of the inactivated COVID-19 vaccine manufactured by Sinovac Life Sciences Co. in Brazil. This trial aims to be a pivotal research to strengthen the licensing of the product, as stated by the concerned officials of the company.

The trial will conduct recruitment of nearly 9,000 healthcare professionals to work in COVID-19 specialised departments, in 12 clinical locations in Brazil.

Sinovac stated on 13 June 2020, a positive preliminary interpretation in Phase I/II clinical trials for the inactivated vaccine, which reported favourable immunogenicity and biocompatible profiles. The Phase II results showed that the vaccine induces neutralising antibodies within 14 days. The neutralising antibody seroconversion frequency is more than 90 per cent.

WHO COVID-19 Solidarity

On 28 May 2020, the WHO announced the launch of a coordinated, globally concurrent randomised controlled Phase III trial of different vaccine candidates. Vaccines will be tested in different geographical communities. The trial targets to enrol more than 280,000 participants, from at least 470 different centres in 34 nations. The Accessibility to COVID-19 Tools (ACT) Accelerator was introduced in April, 2020 to up, regulate the development and distribution to countries of diagnostics, treatments and vaccines. It includes a health systems connector to support delivery of these resources across the globe. The ACT Accelerator aims to deliver two billion vaccine doses for global needs by the end of 2021. The WHO structured a framework for equitable and affordable availability of the vaccines safely and effectively. The COVAX Facility is an umbrella mechanism through which demand and resources are pooled to support procurement of, and equitable access to, COVID-19 vaccines. Vaccine allocation will be driven by public health needs for priority groups, which may represent about 20 per cent of the population, in the first year.

Combination Coronavirus Vaccines to be Tested

The UK scientists are planning trials to see if giving people two different types of COVID-19 vaccine, one after the other, might give better protection than two doses of one jab. This mix-and-match approach can go ahead only if another jab is approved by regulators, as has already happened with the Pfizer/BioNTech vaccine.

The head of the UK's vaccine task force said trial designs were being prepared. That vaccine,

given as two doses, a few weeks apart, offers up to 95 per cent protection against COVID-19 illness, according to data.

Although that is a very impressive figure, experts want to explore whether the immune response can be strengthened further and made more durable with a mix-and-match "heterologous boost" approach.

A UK based Margaret Keenan, 91 has become the first person in the world to be given the Pfizer COVID-19 jab, as part of a mass vaccination programme. It was the very first of 800,000 doses of the Pfizer/biontech vaccine that will be delivered in the coming weeks. Up to four million more are expected by the end of December, 2020. Hubs in the UK are starting the roll out by vaccinating the over-80s and health and care staff.

COVID-19 Vaccine: Indian Scenario

India on 3 January 2020, approved the emergency authorisation of two vaccines against COVID-19 — Covaxin by Bharat Biotech, as well as Covishield developed by University of Oxford and AstraZeneca. Serum Institute of India (SII) has been responsible for manufacturing and testing of Covishield in India. Earlier, Britain and Argentina had approved the emergency marker use of coronavirus vaccine developed by the University of Oxford and AstraZeneca.

A. **Covaxin:** Bharat Biotech has developed Covaxin in collaboration with the Indian Council of Medical Research (ICMR) and National Institute of Virology (Pune) by utilising an inactivated version of Sars-Cov-2. The vaccine received Drug Controller General of India's (DCGI) approval for Phase I & II Human Clinical Trials. The trials commenced across India from July 2020.

After successful completion of the interim analysis from the Phase 1 & 2 clinical trials of COVAXINTM, Bharat Biotech received DCGI approval for Phase 3 clinical trials for 26,000 participants in over 25 centres across India.

However, Bharat Biotech has been criticised for seeking approval for Covaxin without providing data on the vaccine's efficacy, that is, its ability to bring down the number of symptomatic COVID-19 cases. It has been granted restricted use approval in clinical trial mode by DCGI in public interest . However, the regulator did not clarify whether the approval had been granted on the basis of efficacy data. The firm has submitted pre-clinical testing data, and Phase 1 and 2 safety and immunogenicity data.

As per Dr. Krishna Ella, Chairman and MD of Bharat Biotech, the approval implies that the firm will no longer require to have a placebo group in its ongoing clinical trial, and will vaccinate people in an open-label format. The efficacy from late-stage trials of Covaxin on nearly 26,000 participants will become clearer between March and October 2021, which is the efficacy readout timeline set for the vaccine as per the design of the trial.

B. **Covishield**: Pune based Serum Institute of India, the world's largest vaccine manufacturer by volume, joined hands with Oxford-AstraZeneca, British-Swedish drugmaker, to produce 1 billion doses of its COVID-19 vaccine. The local version of Oxford-AstraZeneca COVID-19 vaccine will be known as Covishield.

The 'virus-vectored' vaccine uses a weakened version of a chimpanzee common cold virus that encodes instructions, for making proteins from the novel coronavirus, to generate an immune response and prevent infection. Researchers claim the vaccine protected against disease in 62 per cent of those given two full doses, and in 90 per cent of those initially given a half dose.

In September 2020, SII had expanded its collaboration with Gavi and the Bill & Melinda Gates Foundation, to produce and deliver up to an additional 100 million doses for low- and middle-income countries (LMICs). In this context, SII and Bangladesh's drug maker, Beximco Pharma signed a Memorandum of Understanding (MoU) for priority delivery of the vaccine doses. Beximco will purchase five million doses of vaccine per month, which will be supplied by SII at a price of around 4 to 5 USD per dose; a rate similar to what India pays.

Apart from Covaxin and Covishield, some of the **other vaccine candidates** in the country are as follows:

1. **ZyCoV-D**: Zydus Cadila's vaccine is being made on the DNA platform and is named ZyCoV-D. Cadila has collaborated with the Department of Biotechnology for this. DCGI has given its approval to the Ahmedabad-based drug firm to initiate Phase III clinical trials of its COVID-19 vaccine, ZyCoV-D. Zydus Cadila's vaccine uses a DNA plasmid to replicate portions of Sars-Cov-2 to train the immune system to memorise it.

2. **Sputnik V**: This is a vaccine developed by Russia's Gamaleya Institute. Dr Reddy's Laboratories is conducting phases 2 and 3 clinical trials of Russian vaccine Sputnik V, while Biological E is conducting phase 1 trial of its indigenously developed vaccine

candidate. Russia said on 24 November 2020, that its Sputnik V vaccine was 91.4 per cent effective based on interim late-stage trial results. It started vaccinations in August 2020 and has inoculated more than 100,000 people so far. India plans to make 300 million doses of Sputnik V in 2021.

3. **NVX-Cov 2373**: NVX-COV-2373 is being developed by Serum Institute of India in collaboration with American company NovaVax. Phase 3 trial under consideration.

4. **Biological E Limited Vaccine**: Biological E Ltd plans to start large late-stage trials of its potential COVID-19 vaccine candidate in April 2021. The Hyderabad-based privately held company had said in November 2020, it had started early-stage and mid-stage human trials of its vaccine candidate, being developed in collaboration with Baylor College of Medicine in Houston and US-based Dynavax Technologies Corp, and expects results by February 2021.

5. **HGCO19**: The novel mRNA vaccine candidate, HGCO19, has been developed by Pune-based Gennova Biopharmaceuticals, and supported with a seed grant under the Ind-CEPI mission of the department of biotechnology, of the Union ministry of science and technology. Gennova has worked in collaboration with US' HDT Biotech Corporation to develop the mRNA vaccine candidate. Gennova will start the phase 1 clinical trial of its indigenous vaccine candidate with the enrolment of 120 participants starting from early January 2021.

Gennova's vaccine contains the mRNA template, which functions by penetrating

a genetic code to stimulate the body into making copies of the antigen protein. The antigen protein is a part of the Sars-Cov-2 virus (the pathogen that causes COVID-19), which trains the immune system into identifying and engulfing the pathogen.

6. **Bharat Biotech's Second Vaccine**: Another vaccine is being developed by Bharat Biotech International Ltd in collaboration with Thomas Jefferson University, US, which is at the pre-clinical stages.

7. **Aurobindo Pharma Vaccine:** Aurobindo Pharma Ltd has announced its own COVID-19 vaccine development programme through its US subsidiary Auro Vaccines. That vaccine, which uses recombinant vesicular stomatitis virus (RVSV) vector platform, is being developed by Profectus BioSciences. This vaccine is still in the pre-clinical phase. Aurobindo Pharma has said it would also make and sell US-based COVAX's COVID-19 vaccine candidate for supply in India, and to the United Nations Children's Fund (UNICEF) under a licensing deal.

A COVID-19 Vaccine: India's Mighty Logistics Challenge

With Union Health Minister, Dr. Harsh Vardhan saying "India will have more than one COVID-19 vaccine available to distribute by early next year", experts have questioned about whether the nation has the required infrastructure to store the vaccines, and the logistical capacity to distribute them with transparency.

India is planning to immunise 200-250 million of its population (one-sixth of its population) with 400-500 million COVID-19 vaccines, by July 2021. The first round will be conducted for most vulnerable population groups, including healthcare workers. The estimates are based on the assumption that the infrastructure for the current immunisation programme in the country will be leveraged for the covid vaccination plan; even while keeping the regular immunization program going. In addition, private cold chain companies will be tapped to distribute roughly half of the required doses (300 million over the course of the next year). It will require expansion of India's existing cold chain capacity at a break-neck speed, especially in some of the more densely populated parts of the country, where such infrastructure is severely limited. It will also require addressing gaps in India's existing vaccine distribution network, which a health ministry report flagged a couple of years ago.

In this drastic exercise, India has two merit points if a vaccine were to become available: Indian companies are already manufacturing and supplying the bulk of the world's vaccines, and second, India's experience in performing one of the world's largest immunisation programmes for children and mothers.

(Source: The Wire, 13 October 2020)

Vaccine Allocation

Experts have distributed vaccine allocation in 9 groups. Together, they are thought to represent 90-99 per cent of those at risk, of dying from COVID-19:

1. Residents in care homes for older adults and their care givers
2. 80-year-olds and over, and frontline health and social care workers
3. 75-year-olds and over
4. 70-year-olds and over, and clinically extremely vulnerable individuals
5. 65-year-olds and over
6. 16 to 64-year-olds with serious underlying health conditions
7. 60-year-olds and over
8. 55-year-olds and over
9. 50-year-olds and over

There needs to be a clarity on how smaller batches of the vaccine can be transported without any damage at ultra-cold temperatures of -70C, care home residents will follow, probably from 14 December 2020. People will be vaccinated twice - around 21 days apart - and full immunity starts seven days after the second dose.

Government of India's Plan to Procure and Administer Vaccines

Serum Institute of India (SII), has developed Covishield, the Indian version of the AZD1222 vaccine, manufactured by Oxford University and AstraZeneca, and has already stored around 80 million doses.

Second vaccine that has been permitted for emergency use, Covaxin, manufactured by Bharat Biotech in association with the Indian Council of Medical Research (ICMR), could take a few days or weeks to be available.

In the US and UK, the first shots were administered within 1-2 days of the Pfizer-BioNTech and Moderna vaccines receiving authority approval. In India, the process is likely to be fastened. It is expected that the mass vaccination programme will begin perhaps by the first weekend of January 2021.

Development of Drugs

Overview

Various health agencies across the world like the WHO, European Medicines Agency (EMA), US Food and Drug Administration (FDA), the Chinese Government and drug manufacturers were coordinating with the academic and industry researchers to speed the process of development of vaccines, antiviral drugs, and post-infection therapies for the COVID-19 infection. The International Clinical Trials Registry Platform of the WHO, has recorded more than 536 clinical studies, to develop post-infection therapeutic measures for COVID-19 infections, with numerous established antiviral compounds for treating other infections under various clinical research to be repurposed.

In March 2020, the WHO initiated the "Solidarity Trial" in 10 countries, enrolling thousands of people infected with COVID-19, to assess treatment effects of the four existing anti-viral compounds with the promise of efficacy. A dynamic, systematic review was established in April 2020 to track the progress of registered clinical trials for COVID-19 vaccine, and therapeutic drug candidates.

Clinical Trial Overview

According to a few organisations which were tracking the clinical trial progress on around 29 potential therapeutic drugs for COVID-19

Photo Source- Philippines Lifestyle News

infections, phase II-IV efficacy trials were conducted in March, 2020, or were scheduled to provide results in April, 2020 from hospitals in China. Seven trials were revaluating purposed drugs already approved to treat malaria, including four studies on hydroxychloroquine, or chloroquine phosphate. Repurposing of anti-viral drugs reporting most of the Chinese research was done, with 9 Phase III trials on Remdesivir across several countries by the end of April. Other potential therapeutic medicines under pivotal clinical trials concluding in the month of March-April were corticosteroids, immune modulators, vasodilators, lipoic acid, bevacizumab, and recombinant angiotensin-converting enzyme 2.

Preliminary Clinical Research

Efficacy based on biomarkers, all phase I trials test primarily for safety under preliminary dosing in a healthy subjects, while Phase II trials following success in Phase I, evaluate therapeutic efficacy against the COVID-19 at increasing dosage, while closely evaluating possible adverse effects of the one candidate/compound therapy, or combined therapies, typically in more than hundred people. Most common trial design for Phase II studies of possible COVID-19 drugs are randomized, placebo-controlled, blinded, and conducted at multi-centric, while determining more precise, effective doses, and

monitoring and evaluation for adverse effects. The rate of success for Phase II trials to advance to Phase III (for all diseases) is about 31 per cent, and for infectious diseases particularly, about 43 per cent. Phase III trials for COVID-19 involve thousands of hospitalised participants test effectiveness of the treatment to down regulate the systemic effects of the disease, while evaluating adverse effects at the optimal dose, such as in the multi-centric solidarity and discovery trials. According to two sources reporting early-stage clinical trials on potential COVID-19 post-infection therapies, there were some 36 Phase trials underway, or planned to start in April 2020.

Categories of Potential Therapeutics Against COVID-19

According to one source (as of mid-May 2020), diverse categories of pre-clinical or early-stage clinical research for developing COVID-19 therapeutic compounds included:

- antibodies (61 candidates)
- antivirals (22 candidates)
- cell-based compounds (15 candidates)
- RNA-based compounds (6 candidates)
- scanning compounds to be repurposed (18 candidates)
- various other therapy categories, such as anti-inflammatory, antimalarial, interferon, protein-based, antibiotics, and receptor-modulating compounds, among numerous others (86 candidates) for a total of 293 compounds under development in May 2020.

HIV Drugs for Coronavirus Treatment

Abbvie's HIV protease inhibitor, lopinavir is being reevaluated along with Ritonavir for the treatment of MERS and SARS coronaviruses.

The drug has already been reconsidered and approved for the treatment of HIV infection, under the trade name 'Kaletra'. The combination is listed in the WHO list of essential medicines. Lopinavir is believed to affect the intracellular processes of coronavirus replication, and bespeak to reduce mortality in the non-human primates (NHP) model of the MERS.

Lopinavir/Ritonavir in combination with Ribavirin showed reduced fatality rate and milder disease course during an open clinical trial in patients in the 2003, SARS outbreak. Cipla is also reportedly planning to re-evaluate its HIV drug LOPIMUNE, which is a combination of protease inhibitors; Lopinavir and Ritonavir, to reduce the mortality from coronavirus. A licensed generic form of Kaletra, LOPIMUNE is currently available in packs of 60 tablets each, containing 200mg of Lopinavir, and 50mg of Ritonavir.

Janssen Pharmaceutical Companies, a subsidiary of Johnson & Johnson, donated its PREZCOBIX HIV medication (darunavir/cobicistat) for use in research activities for the treatment for COVID-19. Darunavir is a protease inhibitor, marketed by Janssen. Anecdotal reports suggest darunavir has effective anti-viral properties against COVID-19. It is, however, currently approved only for use with a synergistic agent, and in combination with other antiretrovirals, for the treatment of HIV-1. Janssen has no in vitro or clinical data to support the use of darunavir as a treatment for COVID-19. The drug is being evaluated in vitro for any potential response against corona virus. Further, Janssen has partnered with the Biomedical Advanced Research and Development Authority (BARDA), to hasten the development of a COVID-19 treatment.

Gilead's Remdesivir has demonstrated potency in treating the corona virus infection. The pandemic has transposed focus to Remdesivir, but HIV drugs will return to centre stage. In Gilead lab, antiviral Remedesivir is being tested in multiple Phase 3 clinical trials, as a treatment for moderately and severely ill COVID-19 patients.

A potential anti-viral drug for the corona virus has reportedly failed in its first randomised clinical trial. It revealed that researchers studied 237 patients, administering the drug to 158 and comparing their progress with the remaining 79, who received a placebo. After a month, 13.9 per cent of the patients taking the drug did not survive, compared to 12.8 per cent of those receiving the placebo. The trial was stopped early because of side-effects.

Meanwhile, South Korean doctors have also reported that they have "used the HIV combination drug lopinavir plus ritonavir" which was marketed as "Kaletra," which has succeeded in treating COVID-19 in a 55 years old patient. "Remdesivir was not associated with clinical or virological benefits."(WHO).

Convalescent Plasma Therapy

Research groups in China have also asked former COVID-19 patients who have now fully recovered, to donate their blood plasma to be used possibly as a basis for treatment for the virus. The concept behind the process was to generate antibodies against corona virus.The convalescent plasma therapy is akin to passive immunisation, as according to researchers, it is a preventive measure rather than a treatment for the current virus.

India's Jaipur Model

In India's Rajasthan, early promise was shown for COVID-19 treatment wherein, 3 Coronavirus patients were cured in Jaipur's SMS Hospital & Medical College. On 16 March 2020, it was reported that three out of the four patients who had previously tested positive for COVID-19 have now recovered. Doctors at the SMS Hospital, persuaded the treatment of the patients with a combination of malaria, HIV and swine flu medication.

The following drugs were used by the hospital:

- Lopinavir and Ritonavir are drugs typically used to treat HIV. It has been divulged that a 54 year old patient from South Korea experienced a down regulation in his viral load ,having been treated with the two drugs.The World Health Organisation has also antecedently stated that there could be some benefits of availing the drugs, in combination with others, in therapy of the novel coronavirus.

- Chloroquine, a drug used to treat malaria and autoimmune conditions, has been in use for over 70 years and is considered extremely safe. Although experiments are continuing, researchers have found success in using the drug against the COVID-19 strain, albeit solely in clinical experiments.

Currently, there is no known vaccine or treatment for the novel coronavirus. While the success of the doctors at SMS Hospital offers a glimmer of hope, it is too early to suggest that a cure, or a method to lower the intensity of the virus' symptoms, has been conclusively discovered.

Table: Drug Candidates for Treatment of COVID-19

Drug Candidate	Description	Existing Disease Approval	Trial Sponsor(s)	Location(s)
Remdesivir	antiviral; adenosine nucleotide analog inhibiting RNA synthesis in coronaviruses	investigational	Gilead, WHO, INSERM, NIAID	China, Japan initially; expanded internationally in Global Solidarity and Discovery Trials, and US NIAID ACTT Trial
Hydroxychloroquine or chloroquine	anti-parasitic and anti-rheumatic; generic made by many manufacturers	malaria, rheumatoid arthritis, lupus (International)	CEPI, WHO, INSERM	Multiple sites in China; Global Solidarity and Discovery Trials, Europe, international
Favipiravir	antiviral against influenza	influenza (China)	Fujifilm	China
Lopinavir/ritonavir without or with Rebif	antiviral, immune suppression	investigational combination; lopinavir/ritonavir approved	CEPI, WHO, UK Government, University of Oxford, INSERM	Global Solidarity and Discovery Trials, multiple countries
Sarilumab	human monoclonal antibody against interleukin-6 receptor	rheumatoid arthritis (USA, Europe)	Regeneron-Sanofi	Multiple countries
ASC-09 + ritonavir	Antiviral	combination not approved; ritonavir approved for HIV	Ascletis Pharma	Multiple sites in China
Tocilizumab	human monoclonal antibody against interleukin-6 receptor	immunosuppression, rheumatoid arthritis (USA, Europe)	Genentech-Hoffmann-La Roche	Multiple countries
Lenzilumab	humanized monoclonal antibody for relieving pneumonia	new drug candidate	Humanigen, Inc.	Multiple sites in the United States
Apagliflozin	sodium-glucose co-transporter 2 inhibitor	hypoglycemia agent	Saint Luke's Mid America Heart Institute, AstraZeneca	Multiple countries
CD24Fc	antiviral immunomodulator against inflammatory response	new drug candidate	OncoImmune, Inc.	Multiple sites in the United States

Conclusion and Future Prospects

The impact of the COVID-19 pandemic on social and economic status has far exceeded the previous estimations. The virus has affected many lives across the globe, and the peak of it, is still awaited. Thus, discovering a COVID-19 vaccine is an utmost priority. Vaccine development is a complicated and lengthy process. Various approaches to enhance the development of a biocompatible COVID-19 vaccine have been introduced, including platform development, preclinical testing, phase 1 clinical trials etc.

Till date, more than 150 vaccine candidates, 20 of which have entered phase 1, 2, or even 3 clinical trials, have been documented. Most important consideration before for the approval of a COVID-19 vaccine is its biocompatibility and potency. Legal and thorough planning should be performed to ensure that all individuals have the same access to the vaccines. High-income countries must be stopped from monopolising vaccine supply worldwide. Testing vaccines and medicines without taking the time to fully understand safety risks could bring unwarranted setbacks during the current pandemic, and into the future. The public's willingness to back quarantines and other public-health measures, to slow spread tends to correlate with how much people trust the Government's health advice. A rush into potentially risky vaccines and therapies, will betray that trust and discourage work to develop better assessments. Despite the genuine need for urgency, we need to be patient and hold on to it.

Drug discovery for SARS-CoV-2 requires more details on the structural and biochemical aspects of the COVID-19 life cycle. These will likely enhance the development of drugs and/or vaccine against SARS-CoV-2. Similarly, it is very important to continue to follow the WHO guidelines to prevent the spread of COVID-19, until acceptable drugs and vaccines have been developed.
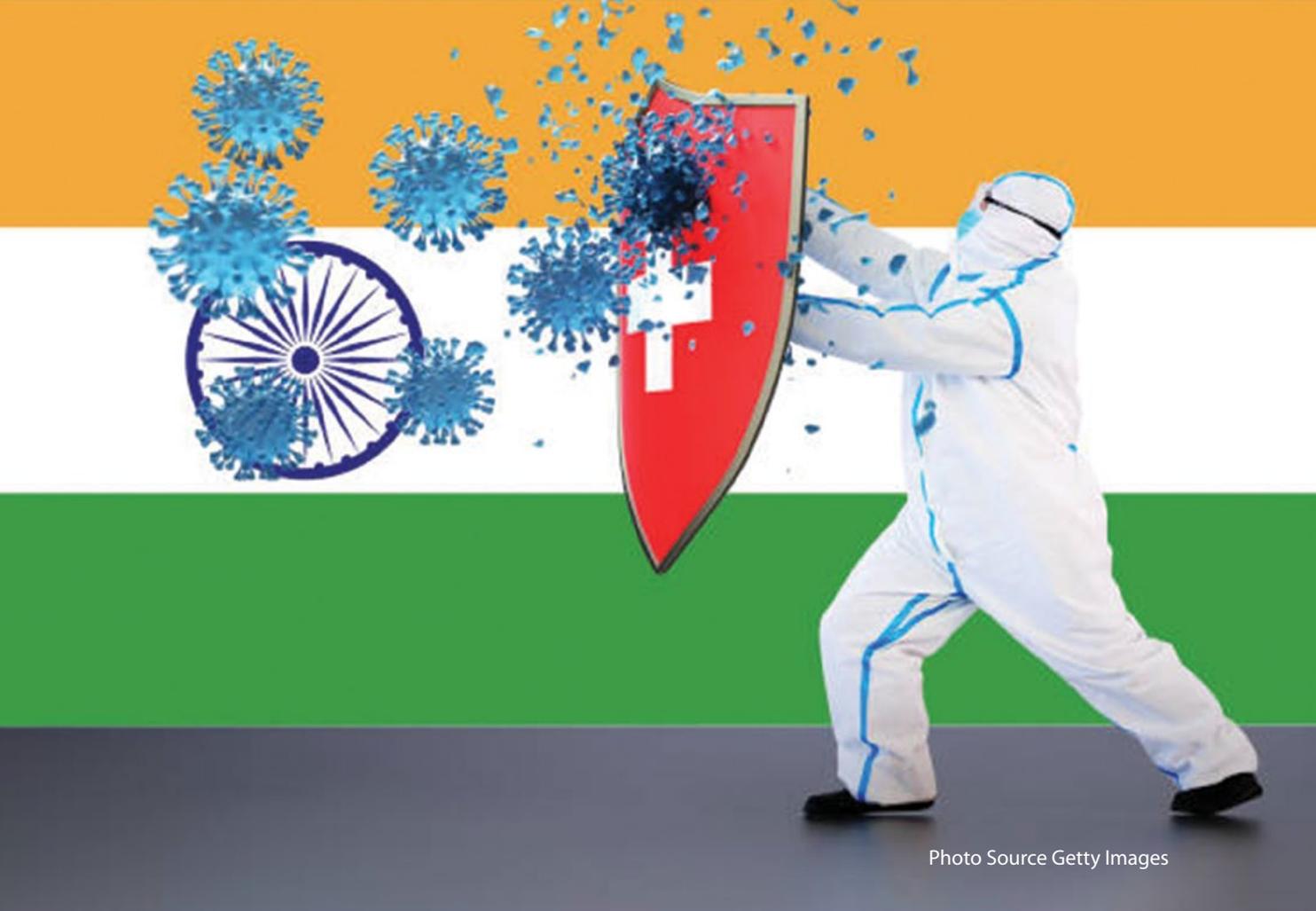

PhotoSource_ Getty images

Photo Source Getty Images

National Response

Situational Analysis of COVID-19 in India

Introduction

The first case of COVID-19 pandemic in India was confirmed on 30 January 2020 in Kerala, which rose to three cases by 3 February 2020; all were students returning from Wuhan. On 24 March 2020, the country went under a nationwide lockdown for 21 days, affecting the entire 1.3 billion population of India. The lockdown was extended in phases till May 2020. From 1 June 2020, the Government started "unlocking" the country (barring "containment zones") in three unlock phases.

The following is a comparative analysis of 28 States and 7 Union Territories (excluding Lakshadweep Islands) to evaluate the COVID-19 spread and fatality as of 8 December 2020. The analysis excludes Lakshadweep Islands which was not exposed to the virus as of mid-December 2020.

Between 8 and 30 June 2020, India underwent Unlock Phase 1, when shopping malls, offices, religious places opened across India after more than two months. This was also the period when cases started rising in India almost uncontrollably, despite the phased manner of opening the nationwide lockdown. In fact by 12 June 2020, India had overtaken UK to become

4th worst coronavirus-hit country, with over 3 lakh cases and in another 15 days cases in India had crossed 5 lakhs. Thus, to draw meaningful comparisons, confirmed cases and fatality data as of 30 June 2020 has been compared with the same parameters after about 21 weeks (8 December 2020).

Overview of COVID-19 in India

Table 1 evaluates the state-wise COVID-19 total positive cases, active cases and their percentage share in total cases, deaths and case fatality ratio as of 8 December 2020.

Maharashtra has been the most affected state since COVID-19 cases started arising in significant numbers in the country. The state has the highest number of confirmed cases as well as deaths in India. Further, as of 8 December 2020, most of the South Indian States have confirmed the highest positive cases. However, such grave is the situation in Maharashtra that the next most affected state Karnataka (894,004) has confirmed less than half the cases confirmed in Maharashtra (1,855,341). Karnataka is closely followed by Andhra Pradesh and Tamil Nadu with 872,288 and 791,552 confirmed cases respectively.

While the first few cases in India were confirmed in Kerala, at 639,664, the State has confirmed only one-third of the Maharashtra cases.

India's top metropolitan cities — Delhi, Mumbai, Kolkata, Chennai, Bengaluru and Hyderabad — account for nearly half of the country's cases of COVID-19. Delhi, Mumbai and Chennai – were the main urban epicentres of the disease. But a massive spike in cases in Bengaluru through September 2020, has propelled the southern city to the second spot ahead of Mumbai and Chennai.

S. No.	State	Total	Active Cases	Active Case (%)	Deaths	Case Fatality Rate (%)
1	Maharashtra	1,855,341	76,852	4.14	47,774	2.57
2	Karnataka	894,004	24,786	2.77	11,867	1.33
3	Andhra Pradesh	872,288	5,626	0.64	7,038	0.81
4	Tamil Nadu	791,552	10,695	1.35	11,809	1.49
5	Kerala	639,664	59,607	9.32	2,441	0.38
6	Delhi	593,924	22,486	3.79	9,706	1.63
7	Uttar Pradesh	556,397	21,732	3.91	7,944	1.43
8	West Bengal	505,054	23,829	4.72	8,771	1.74
9	Odisha	321,564	3,339	1.04	1,778	0.55

TABLE 1: COVID-19 in India: State and U.T. wise Data (as of 8 December 2020; Source: MoHFW)

10	Rajasthan	282,512	21,671	7.67	2,448	0.87
11	Telengana	274,540	7,696	2.80	1,477	0.54
12	Chhattisgarh	248,232	19,589	7.89	3,010	1.21
13	Haryana	245,288	12,126	4.94	2,611	1.06
14	Bihar	238,648	5,467	2.29	1,297	0.54
1516	Gujarat	220,168	14,493	6.58	4,095	1.86
17	Madhya Pradesh	215,957	13,443	6.22	3,347	1.55
18	Assam	213,925	3,585	1.68	995	0.47
19	Punjab	156,839	7,604	4.85	4,934	3.15
20	Jammu and Kashmir	113,568	5,055	4.45	1,755	1.55
21	Jharkhand	110,457	1,759	6.67	988	0.89
22	Uttarakhand	78,509	5,234	2.66	1,295	1.65
23	Goa	48,776	1,297	17.28	701	1.44
24	Himachal Pradesh	45,697	7,895	1.05	739	1.62
25	Puducherry	37,270	392	1.30	615	1.65
26	Tripura	32,925	427	11.13	373	1.13
27	Manipur	26,225	2,919	5.08	309	1.18
28	Chandigarh	18,113	921	4.31	293	1.62
29	Arunachal Pradesh	16,415	707	5.04	55	0.34
30	Meghalaya	12,314	621	5.07	120	0.97
31	Nagaland	11,418	579	8.55	66	0.58
32	Ladakh	8,896	761	7.13	121	1.36
33	Sikkim	5,203	371	1.70	117	2.25
34	Andaman and Nicobar Islands	4,773	81	5.17	61	1.28
35	Mizoram	3,968	205	0.48	6	0.15
36	Dadra and Nagar Haveli and Daman and Diu	3,346	16	4.14	2	0.06
	TOTAL	9,703,770	383,866	3.96	140,958	1.45

State-wise Active Cases

A more accurate picture of the present situation is provided by the active cases data. As of 8 December 2020, India has just 3.96 per cent active COVID-19 cases. State wise, only two small States have more than 10 per cent active COVID-19 cases- Himachal Pradesh (17.28%) and Manipur (11.13%). Maharashtra, the state with the highest number of confirmed cases has just 4.14 per cent of cases as active ones.

Further, Delhi, West Bengal and Uttar Pradesh are among the most dense States/UTs of India and all of them have made it to the top ten States, with active cases list. However, the highest number of active cases are present in Maharashtra followed by Kerala. Together, these two comprise more than 35 per cent of active cases in the country, as of 8 December 2020. Delhi has the fifth highest active cases for the same time period.

Apart from Manipur (2,919) and Assam (3,585), all the other North-eastern States have just triple digit active cases.

Region-wise COVID-19 Distribution

The following is a brief visualisation of the State wise cumulative confirmed cases, based on their geographical location.

North India

Maximum States have been captured in this geographical zone. Both Delhi and Uttar Pradesh had crossed half a million

Graph: States in India with Highest COVID-19 Active Cases

76852 — MAHARASHTRA
59607 — KERALA
24786 — KARNATAKA
23829 — WEST BENGAL
22486 — DELHI
21732 — UTTAR PRADESH
21671 — RAJASTHAN
19589 — CHHATTISGARH
14493 — GUJARAT
13443 — MADHYA PRADESH

■ Active cases

Source:MoHFW; till 8 December 2020
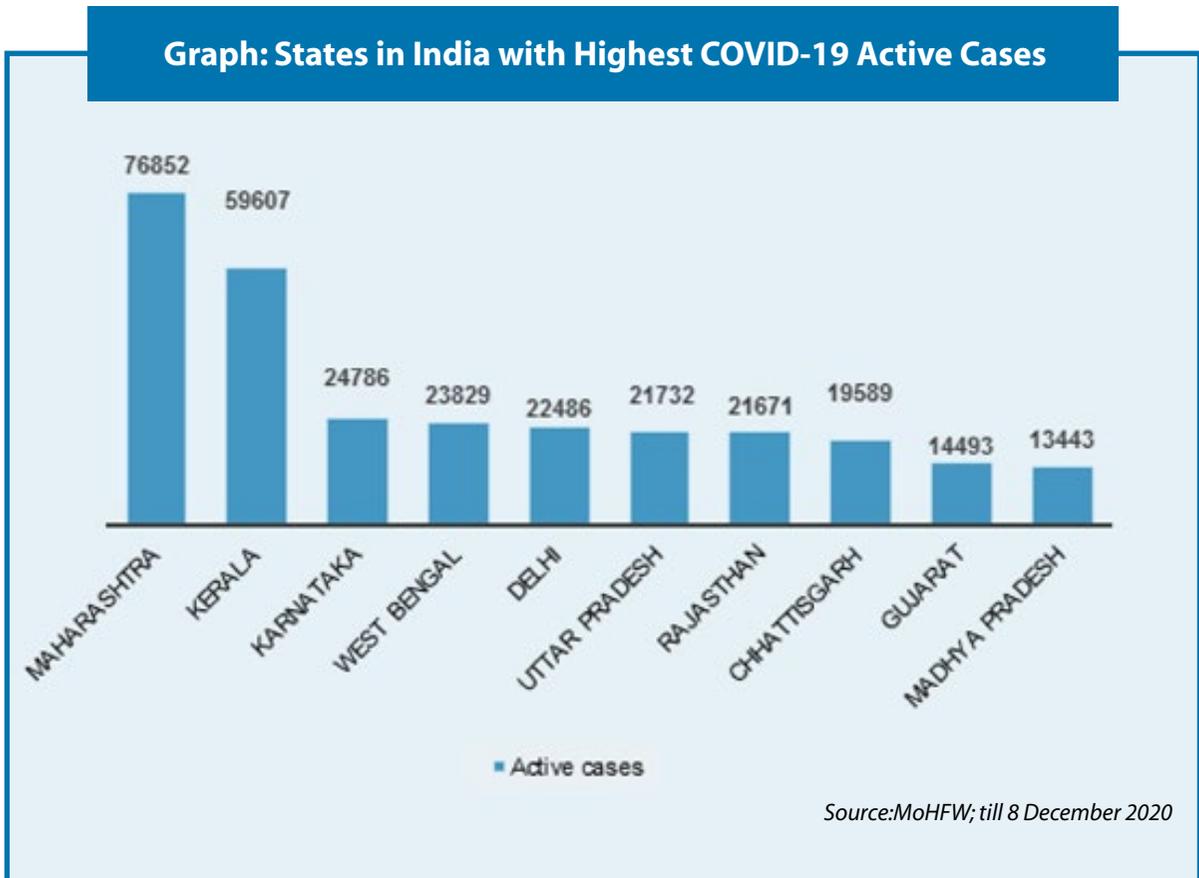
Graph: COVID-19 Confirmed Cases (North India)
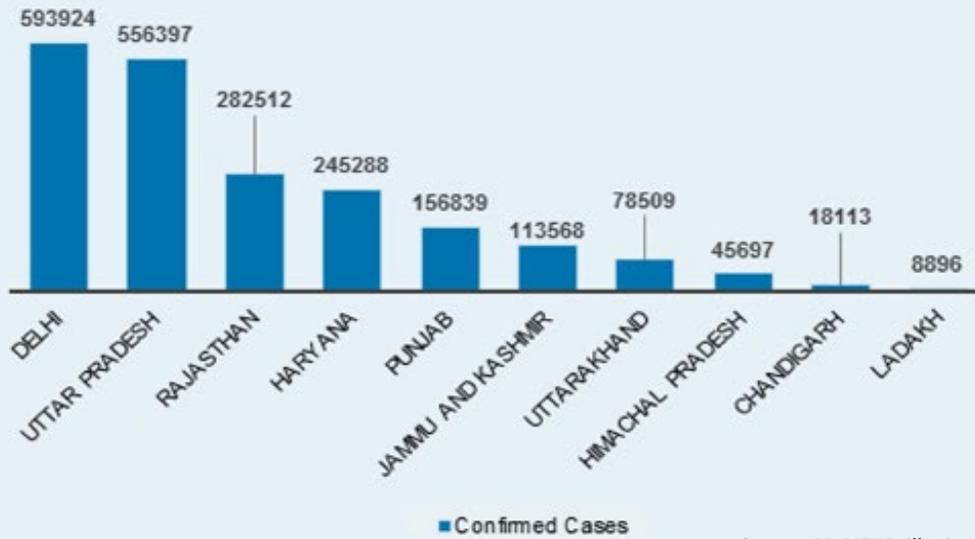
Source: MoHFW; till 8 December 2020

mark as of 8 December 2020. Together they encompass more than 50 per cent cases in North India, and less than 12 per cent of total confirmed cases in India. This is despite the fact that Uttar Pradesh has near about 20 per cent of the national population.

North-East India

Assam is the most affected State in north-east India with more than two-third of the cases in the region. The state's as well as northeast's largest city, Guwahati, has been worst affected by pandemic. The state has also begun

Graph: COVID-19 Confirmed Cases (North East India)

Source: MoHFW; till 8 December 2020

Graph: COVID-19 Confirmed Cases (Central and West India)

Source: MoHFW; till 8 December 2020
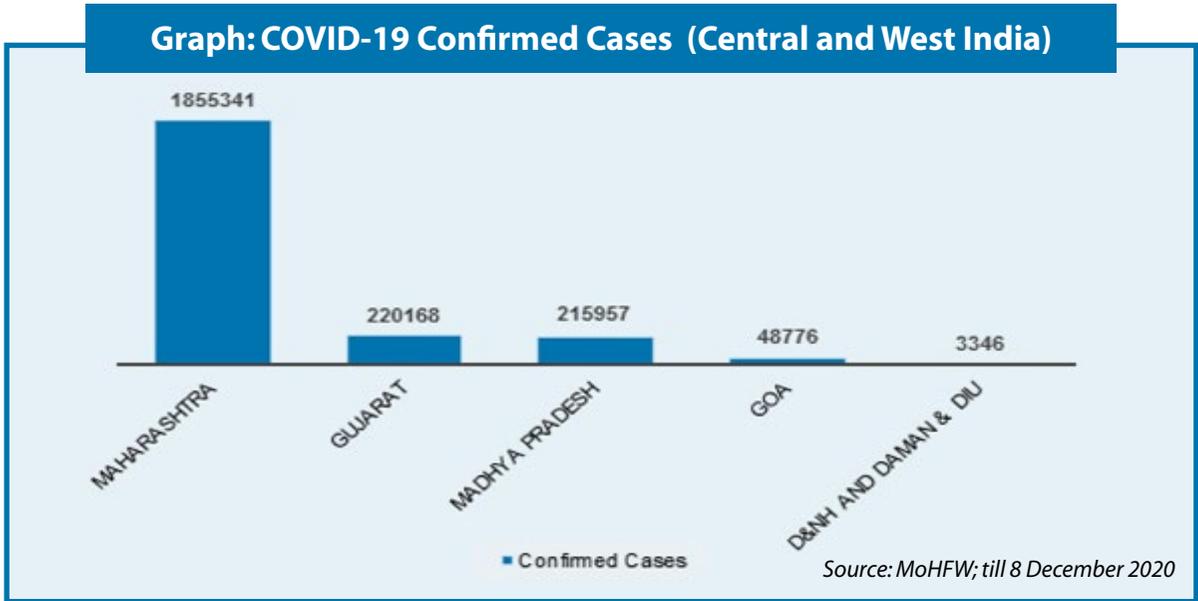
witnessing a spike in the number of COVID-19 cases, as the migrant workers and many people of Assam stranded in other parts of the country returned to Assam.

Mizoram seems to be least impacted in the region with just 3,968 total confirmed cases.

Central and West India

This is one of most impacted regions in the country. 79 per cent of the cases are focused in Maharashtra. Further, Maharashtra with Gujarat and Madhya Pradesh, have more than 97 per cent of the cases in the region. Further,

Maharashtra has about one-fifth of the total cases in the country, when the state has just 9 per cent of the country's population.

The States in the region have some of the highest active cases with Maharashtra, Gujarat, and Madhya Pradesh having 4.14, 6.58, and 6.22 per cent active cases as of 8 December 2020.

East India

West Bengal has the highest number of total confirmed cases as well as currently active cases in the region as of 8 December 2020. While Odisha has the second highest

Graph: COVID-19 Confirmed Cases (East India)

Source: MoHFW; till 8 December 2020
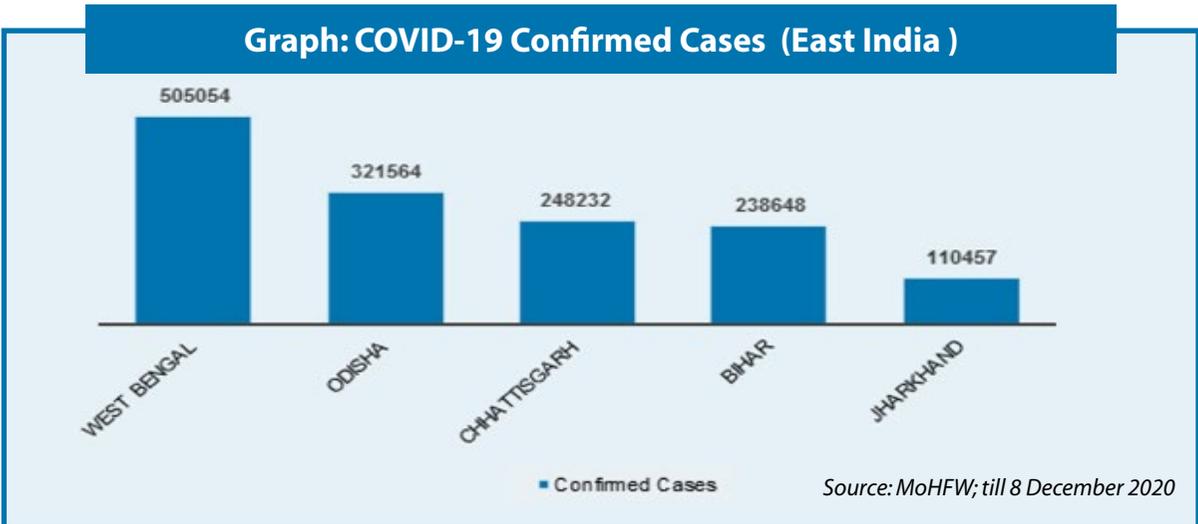
Graph: COVID-19 Confirmed Cases (South India)

Source: MoHFW; till 8 December 2020

cumulative cases in the region, only 1.04 per cent cases are currently active in the coastal State. Chhattisgarh, on the other hand, has the second highest active cases in the region which comprise a grave 7.89 per cent of its total confirmed cases.

South India

This geographical region is probably the most affected in the country. While Maharashtra from West India alone comprised of about 20 per cent cases of the country, the next four most affected States are from the south. All together, more than 36 per cent confirmed cases of the country are located in South India.

As of 8 December, 2020, Kerala has the highest active cases (59,607) and the highest active

case rate (9.32%) in the region. While Andhra Pradesh has the second highest cumulative cases, only 0.64 per cent of its total confirmed cases are still active as of 8 December 2020.

State-wise COVID-19 Case Fatality Rate

While active cases are better than cumulative cases in assessing the current situation of the pandemic, they too can be a little deceptive if the State is not undergoing enough testing. However, Case Fatality Rate (CFR) can help in assessing the gravity of the situation by evaluating the COVID-19 deaths as compared to the total COVID-19 cases.

As of 8 December 2020, Punjab has the highest CFR in the country, followed by Maharashtra and Sikkim.

**Graph: States in India with Highest COVID-19 Case Fatality Rate**
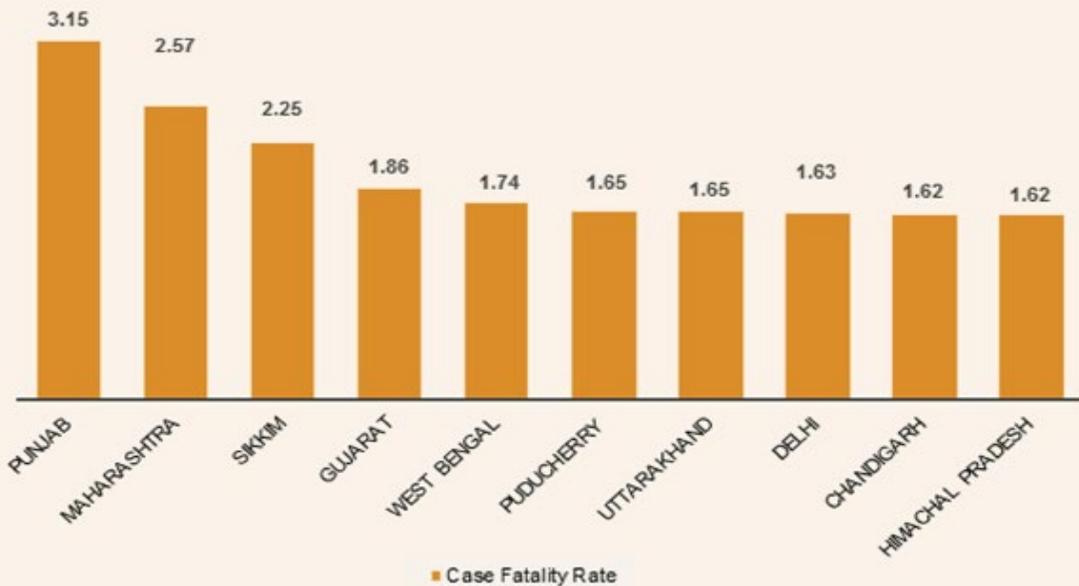
Source: MoHFW; till 8 December 2020

Despite the high case load in Andhra Pradesh, the State has managed a 0.81 per cent CFR as of 8 December 2020. Assam, Bihar and Odisha too have managed a low CFR, despite a sudden spike in their cases and the limited resources at their hand.

**Graph: States in India with Lowest COVID-19 Case Fatality Rate**
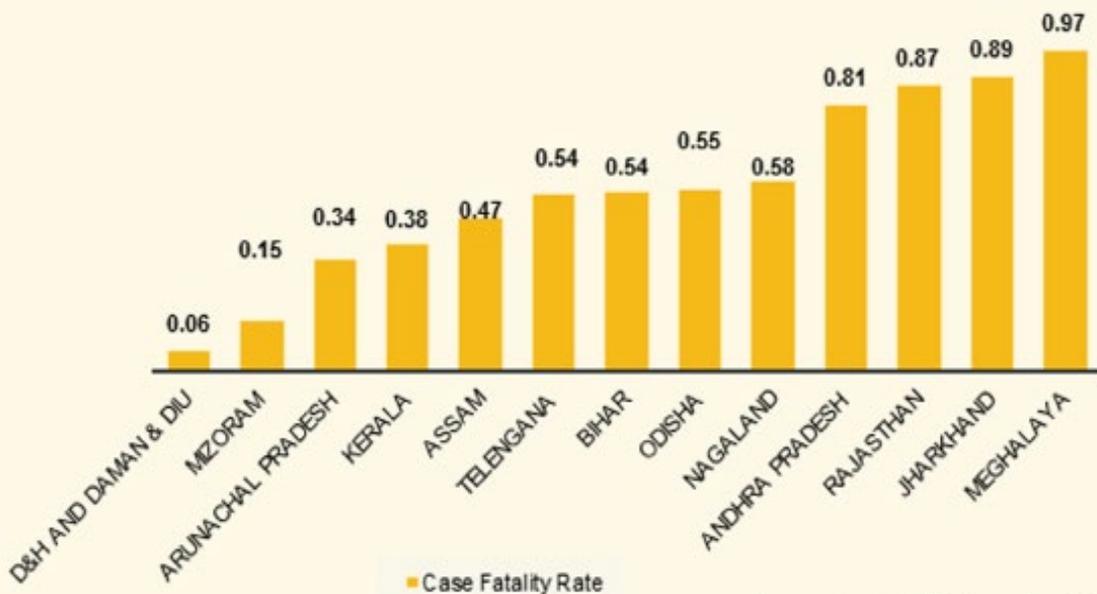
Source: MoHFW; till 8 December 2020

Further, on comparing the current (8 December, 2020) CFR of the States with their CFR as on 30 June 2020, it was found that CFR in Chhattisgarh, Jharkhand, Odisha, Uttarakhand, Jammu and Kashmir, Punjab and Tamil Nadu has increased since June. The rest of the States, including the ones having highest active cases as of 8 December 2020 have reduced their CFR since 30 June, 2020.

The most drastic reduction in CFR has been observed in Gujarat, where it came down from 5.70 to 1.86 per cent. Similarly, Madhya Pradesh and Maharashtra too have observed a reduction in CFR from 4.22 to 1.55, and from 4.50 to 2.57 per cent respectively.

Graph: COVID-19 Case Fatality Rate in India's Top 21 Affected States
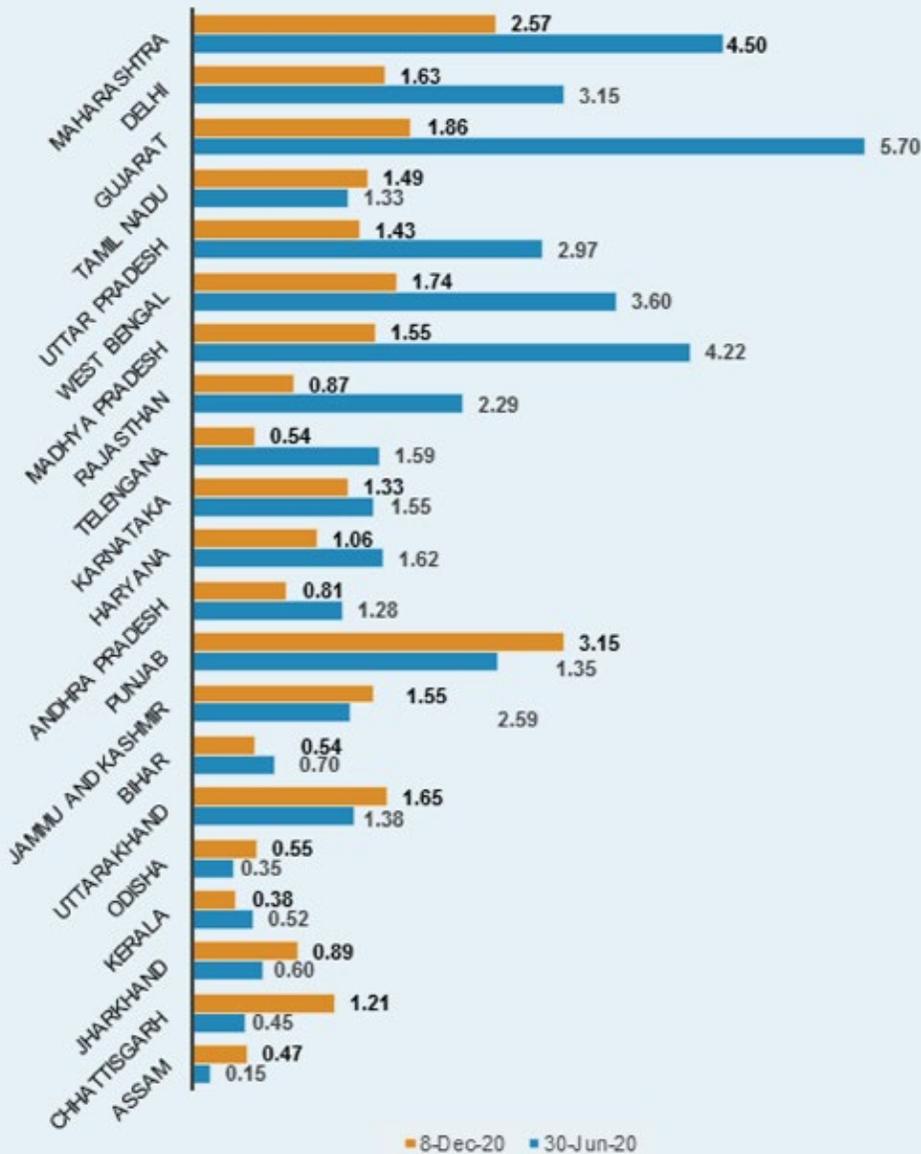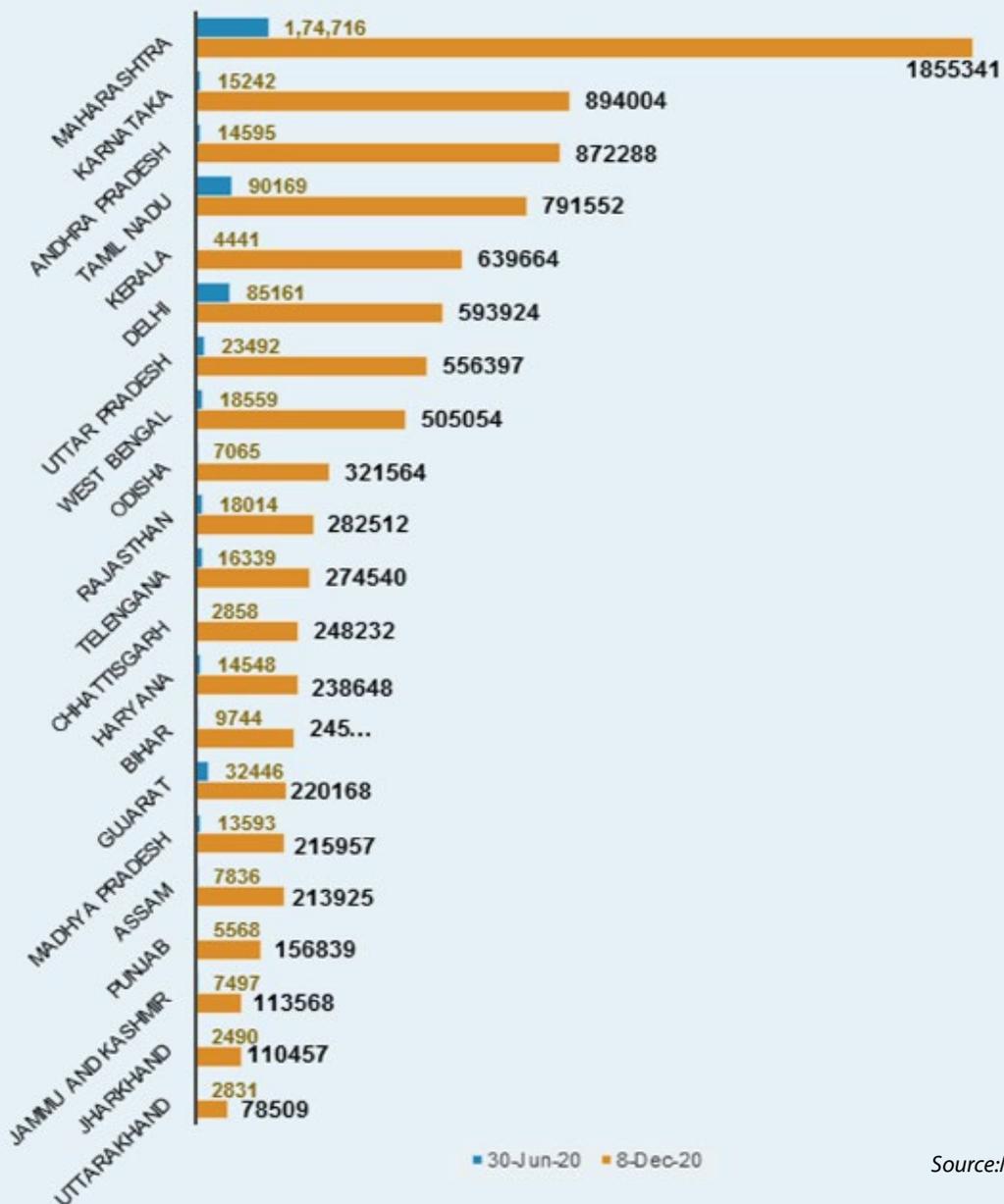
Source:MoHFW

COVID-19 Confirmed Cases and Fatalities: Then and Now

Below are two graphs which compare the COVID-19 data for the Top 21 most affected States and U.T.s in the country.

On comparing the data from 30 June and 8 December, 2020, a number of observations can be derived. An exponential increase in the cases can be seen in almost all big states such as Maharashtra, Andhra Pradesh, Tamil Nadu, Karnataka, Kerala, etc. While Maharashtra followed by Tamil Nadu, Delhi and Gujarat were the top states with COVID-19 confirmed cases by June 2020 end; by the first week of December 2020, the situation had shifted towards South India.

Graph: COVID-19 Confirmed Cases in India: Top 21 States

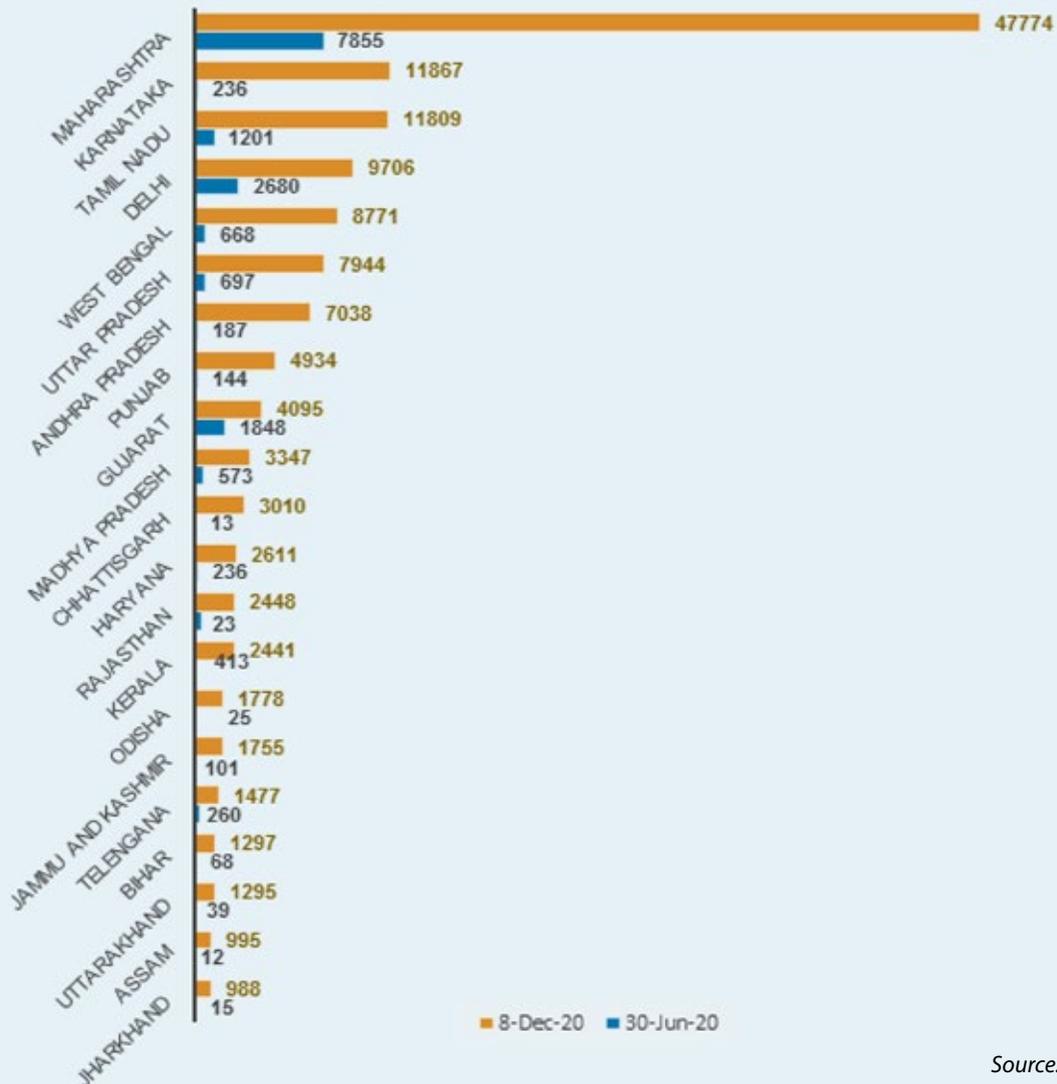| State	30-Jun-20	8-Dec-20
MAHARASHTRA	1,74,716	1855341
KARNATAKA	15242	894004
ANDHRA PRADESH	14595	872288
TAMIL NADU	90169	791552
KERALA	4441	639664
DELHI	85161	593924
UTTAR PRADESH	23492	556397
WEST BENGAL	18559	505054
ODISHA	7065	321564
RAJASTHAN	18014	282512
TELENGANA	16339	274540
CHHATTISGARH	2858	248232
HARYANA	14548	238648
BIHAR	9744	245…
GUJARAT	32446	220168
MADHYA PRADESH	13593	215957
ASSAM	7836	213925
PUNJAB	5568	156839
JAMMU AND KASHMIR	7497	113568
JHARKHAND	2490	110457
UTTARAKHAND	2831	78509

■ 30-Jun-20   ■ 8-Dec-20

Source: MoHFW

Further, on comparing the COVID-19 deaths till 30 June 2020 with the more recent data (as of 8 December 2020), it is found that while Maharashtra has continued to record the highest COVID-19 deaths in the country, the numbers drastically increased in the State (from 7,855 to 47,774). Thus, despite the reduction in CFR since June 2020 (from 4.50 to 2.57), the state has recorded extremely high deaths in terms of sheer numbers. In fact, the State accounts for more than one third of the country's deaths as of 8 December 2020.

Gujarat has displayed tremendous control in case fatalities. On 30 June 2020, 1,848 deaths were recorded which increased to just 4,095 as of 8 December 2020.

Similarly, Kerala, despite having the highest active cases in South India, and second highest active cases in India, recorded just 2,441 deaths as of 8 December 2020. On 30 June 2020 the State had recorded just 413 deaths.

Graph: COVID-19 Fatalities in India: Top 21 States

| State	8-Dec-20	30-Jun-20
MAHARASHTRA	47774	7855
KARNATAKA	11867	236
TAMIL NADU	11809	1201
DELHI	9706	2680
WEST BENGAL	8771	668
UTTAR PRADESH	7944	697
ANDHRA PRADESH	7038	187
PUNJAB	4934	144
GUJARAT	4095	1848
MADHYA PRADESH	3347	573
CHHATTISGARH	3010	13
HARYANA	2611	236
RAJASTHAN	2448	23
KERALA	2441	413
ODISHA	1778	25
JAMMU AND KASHMIR	1755	101
TELENGANA	1477	260
BIHAR	1297	68
UTTARAKHAND	1295	39
ASSAM	995	12
JHARKHAND	988	15

Source:MoHFW

Back in June 2020, 78 per cent of the COVID-19 deaths were in just four States- Maharashtra, Delhi, Gujarat and Tamil Nadu. Maharashtra alone recorded 45 per cent of COVID-19 deaths by 30 June 2020. However, as the pandemic spread across the country post lockdown, more than 80 per cent of COVID-19 deaths in India as of 8 December 2020 are in Maharashtra, Karnataka, Tamil Nadu, Delhi, West Bengal, Uttar Pradesh, Andhra Pradesh, Punjab and Gujarat. It must be observed that these States comprise of the four metropolitan cities of the country - Delhi, Mumbai, Bangalore and Kolkata, along with other urban hubs.

Testing Per Million

As of 17 November 2020, India had conducted 127,480,186 tests in total, or 92,033 tests per 1 million people. Andaman and Nicobar Islands have the highest test per million rate at 359,363, closely followed by Delhi (350,328) and Ladakh (332,109). Madhya Pradesh has the lowest test per million rate at 48,899, followed by Nagaland at 53,760. Uttar Pradesh almost mirrors the national average at 92,302 tests per million.

Graph: Tests Conducted by States (per million on population

■ Tests Conducted per million
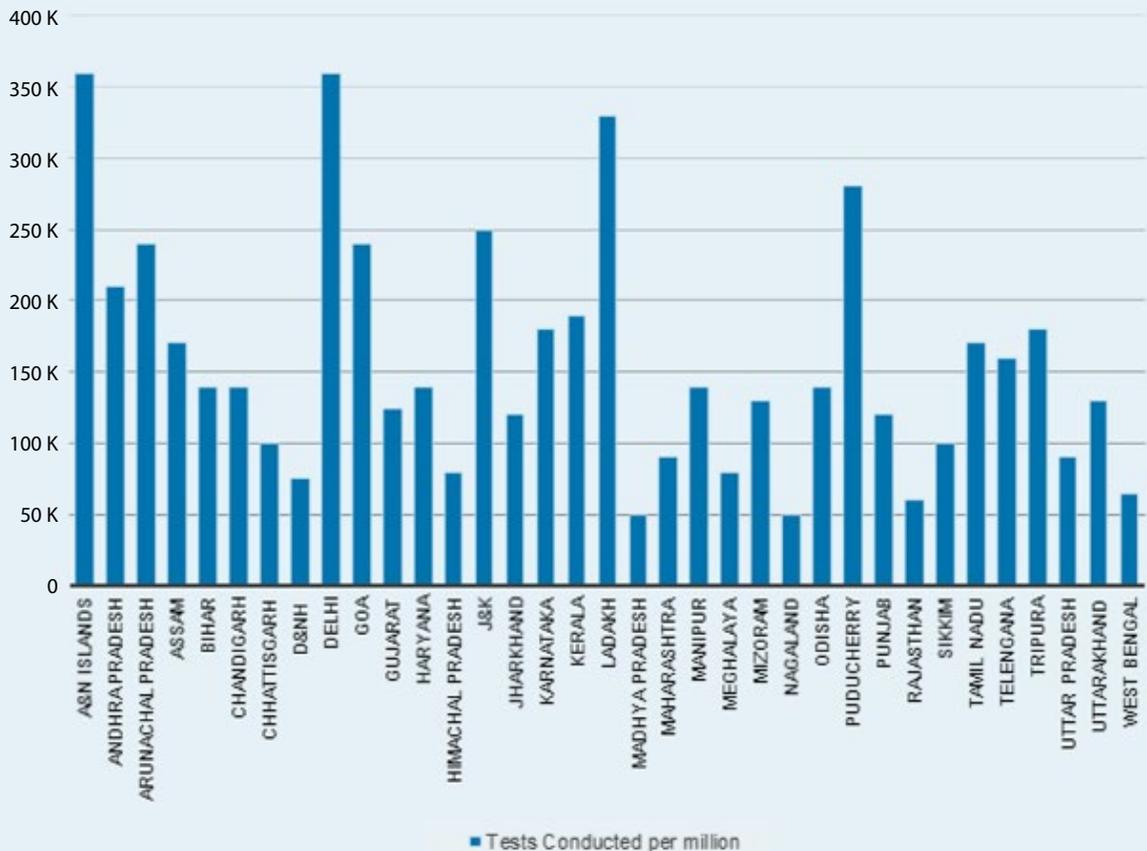
Source:Business standard, 17 November 2020

Conclusion

While the total confirmed cases in India have exploded exponentially since the lockdown was lifted from the country, the national case fatality rate has remained below many developed countries across the world. There are European countries that have total confirmed cases lesser than Maharashtra, but have CFR higher than India's national average!

For example, by 8 December 2020, Spain, United Kingdom and Maharashtra had recorded 1,702,328, 1,737,964 and 1,855,341 confirmed cases respectively. However, while the CFR of Maharashtra was 2.57 per cent and of India was 1.45 per cent by the same date, the UK and Spain had recorded a CFR of 3.53 and 2.74 per cent respectively.

However, testing per million must be improved, especially in certain big states such as Maharashtra, Madhya Pradesh, Bihar and Rajasthan to get a better picture of the impact of the pandemic on the country.

Photo Source: R Ravi for Forbes India

Dr Santhosh Kumar, deputy superintendent at the Government Medical College in Thiruvananthapuram, Kerala is leading the charge despite suffering a heart attack in November 2020.

Photo Source : Economic Times

Response of Government of India to the Pandemic

Our country is not alien to epidemics, pandemics and natural disasters. It has a vast experience of handling crisis such as cholera, bubonic plague outbreak and has responded valiantly to HIV/AIDS in the past. In the year 1999 when the AIDS epidemic was at its peak, 90,000 cases were reported, which proved to be a non-credible number. A nationwide sentinel survey done by the National AIDS Control Organisation (NACO) estimated HIV prevalence in the country to be around three million. The Government bit the bullet and announced the figures to a startled nation. The aftermath was a sense of turmoil for

sometime, but it equipped the country to gear up for a strong response for the next 10 years. This in turn reversed the trend and brought down new HIV infections by 56 per cent.

COVID-19 was not a bolt from the blue like say the Bhuj Earthquake, but a slow on-setting disaster which reached our shores, travelling thousands of miles and taking quite a few weeks to set in. We had ample time in hand to prepare for the outbreak of the disaster. Yet, the chaos due to COVID-19 and haphazard policy decisions have proved to be far more devastating in comparison to any previous catastrophe.

Delayed Initial Response

The first confirmed case of COVID-19 was reported on 30 January 2020 in Kerala where a student who had been studying in Wuhan University, China returned home with the virus. The same day, WHO declared it a public health emergency of international concern.

Government of India, if not promptly but soon enough, responded to this threat. The authorities had taken few preventive measures in the month of January. India thereafter started reviewing preparedness from 17 January 2020, wherein the Ministry of Health and Family Welfare issued necessary directions to the concerned with regards to infection prevention and control (IPC), risk communication and community surveillance.

Mid-January onwards only three international airports in India were carrying out thermal screenings for those flying to China, which was further amplified to seven airports in late January. On 5 February 2020, India banned entry of foreign nationals travelling from China to India. By 31 January 2020, twenty-five other countries had also confirmed several Covid-19 cases.

India waited for almost another month, till 3 March 2020 before banning entry to nationals from Italy, Iran, South Korea and Japan. Other countries such as Spain, Switzerland, the US and the UK also seemed to be on the cusp of the Coronavirus epidemic. However, India did not make it mandatory to screen travellers from these countries at the port of entry until 4 March 2020. That is when universal screening of all international passengers began. India finally suspended all international travels on 22 March 2020, more than two months after it had issued its first travel advisory.

Unfortunately, in the initial weeks, India's response of regulating and screening the passengers from the few adversely affected countries was lackadaisical because it was managed by administrators who lacked experience, and training in management of a public health emergency. Over and above that, the facilities for checking and quarantine were not well managed either.

According to the Government sources, 15 lakh people entered the country between January 18 and 23 March 2020. These figures pertained to only air travellers.

The travellers who entered the country in March 2020 were screened only for high temperature; even though WHO released a report on COVID-19 in China on 28 February 2020, acknowledging the possibility of asymptomatic and pre-symptomatic transmission. One can only wish that this phase was handled by Armed Forces Medical Corps, or a similar competent outfit that exists in the country.

Sudden Total Lockdown that Led to Unseen Challenges

On the appeal of our Honourable Prime Minister, Shri Narender Modi, in an effort to prevent the spread of the virus, a nation-wide 14-hours voluntary curfew known as 'Janta Curfew' was observed on 22 March 2020. A day before the *Janata Curfew*, the officials of Health Ministry urged the people not to panic as there was no plan for a lockdown. On 24 March 2020, our Honourable Prime Minister addressed the nation at 8 pm, declaring a nation-wide complete lockdown for 21-days, from midnight onwards. This decision of imposing a sudden lockdown without taking States and other stakeholders into confidence, brought the lives of 1.2 billion Indians to a grinding halt.

.Photo Source -Saumya Khnadelwal-National Geographic

It left the citizens in a lurch, with no assured access to essential services, creating a situation of absolute chaos and panic.

The total lockdown helped slow down and delay the transmission of the virus among masses for a couple of months. It also gave the Government more time to be prepared for the upcoming wave. Efforts were made to take care of the prevalent public health concerns, however it led to accelerated humanitarian, political and economic crisis. It caused anguish, hunger, unemployment, mass exodus of the migrant workers to their villages, and loss of access to health care.

The traumatic consequence was the sudden departure of lakhs of migrant workers for their home by foot. The lockdown revealed the plight of vulnerable migrant labourers, and became the reason to ponder about the migrant workers' hopeless and helpless

condition. These workers were stranded in big cities with no work, no way to feed themselves, far removed from family support. Millions of them had no options but to defy the lockdown, as they walked back hundreds to thousands of miles with their kids, bereft of food, water and public transport; to be able reach their homes. This resulted in many deaths due to hunger, dehydration, and exhaustion. The hostile treatment at the inter-state borders, and inhumane treatment by flag-bearers, police and other administrative authorities, further added to their miseries. The lack of coordination between the Central and State governments became quite evident.

According to a United Nations University study, an estimated 104 million Indians could fall below the World Bank's determined poverty line of 3.2 USD a day for lower-middle-income countries. This will take the proportion of people living in poverty from 60 per cent

or 812 million currently, to 68 per cent or 920 million; a situation last seen in the country more than a decade ago.

Ideally during the lag time, the Government functionaries, NGOs, political parties, and trade unions could have explained to these workers that they should stay put, while their health, shelter and food would be taken care of. This well-planned action in turn would have prevented mass exodus of the migrant workers and would have aborted any reason for the wide-spread confusion.

A time lag would have helped everybody for being better prepared to face this challenge in an organised manner, without suddenly disrupting commerce, industry, livelihood and all the other dimensions of life. It is also important to reflect whether the entire country needed to come under the lockdown. In States like Sikkim, Nagaland, Arunachal Pradesh, there were hardly any incidents which warranted complete lockdown. Even in a totalitarian country like China, they only closed down Wuhan, and not the neighbouring provinces.

Government's Approach- "From Theory to Implementation"

A comprehensive scientific, theoretical framework on 'India COVID-19 Emergency Response and Health System Preparedness' was developed by Government of India in March 2020, which captured the effective strategies to respond and mitigate the COVID-19 threat and strengthen national systems for public health preparedness in India. This plan targeted the needs of disadvantaged and vulnerable groups, as well as promoted active involvement of communities and other stakeholders. However, this Stakeholder Engagement Plan (SEP) was substantially

ignored, while implementing the COVID-19 strategies on the ground level.

For instance, no scientific evidence, or explanation was shared as a basis for the stringent measures taken by the Government, while announcing the total lockdown. An obtuse attempt was made by the Government on 11 April 2020 to justify their decision. The Health Ministry presented a graph that claimed that India would have had 8.2 lakh COVID-19 cases by 15 April 2020 without the lockdown and containment measures. With containment measures but no lockdown, cases would have been around 1.2 lakhs.

To get to 8.2 lakh cases on 15 April from 24 March 2020 (492 cases), the average daily growth rate had to be 40 per cent. No country even at the peak of the pandemic has reported 40 per cent growth rate. Russia was the highest at 19 per cent. To give a comparative example, Russia had imposed restrictions, but Sweden had not and its case growth was much lower at 7 per cent for the same period.

No empirical explanation was offered by the Government for the subsequent extension, or easing of the lockdown restrictions. On 24 April 2020, National Task force Group on Medical Management of COVID-19 presented a mathematical modelling and transmission dynamics that if current trend followed, India would be at zero new cases by 16 May 2020. However, India reported the highest single day spike in COVID-19 cases and fatalities on 17 May 2020. It clearly reflects the rudimentary modelling of the Coronavirus crisis in India.

In the management of a serious pandemic of this nature, we need to be more than sure about the data; scientifically analysing it to develop a clear strategy. A holistic analysis

should have been shared with the country, rather than highlighting only the positives.

Transparency and Regular Communication

Transparency and regular communication are crucial for building trust between the Government and its citizens. The Government reiterated its stand during a press conference on 9 July 2020 by claiming that there was no community transmission in India. The term 'community transmission' refers to a person-to-person spread of an infection, where the source is difficult to trace. The exponential rise in the caseload for those few months, despite the fact that the country's borders were sealed for incoming travellers; it is hard to believe that India had not reached the stage of community transmission.

The Government is continuing with its strategy of testing, tracing, tracking and quarantining, and the containment measures. Public health experts say acknowledging community transmission will shift the focus from containment to mitigation, leading to policy changes such as a more liberal testing regime. The Government of India finally admitted after nine months of pandemic, on 18 October 2020, that India was now in the stage community transmission, but 'limited to only few districts and states'.

There is an urgent need to maintain the trust of the public by being transparent in the presentation of Government facts, just like the way NACO did during the HIV epidemic. This will in turn be helping the Government to strategise and strengthen their response, and preparing the citizens for facing the reality of the situation.

Imperatives of Centre-States Coordination on COVID-19 Management

Effective management of COVID-19 crisis demands for effective coordination between the Centre and States, as well as between States themselves. Some recent developments have revealed fissures in Centre-State cooperation. Government of India's decisions from an abrupt lockdown, shutting down the borders and use of authoritarian force against those who wanted to return to their homes; all these were clearly reflective of a command-and-control approach, rather than a developing collaborative systems to contain the spread of the disease.

In the initial period, Centre-States relations witnessed frictions with regards to vital decisions, such as declaration of the nationwide lockdown by the Centre without taking States into confidence. The lockdown of few months exposed the fault lines that were there in the system. Centre-State conflicts were mounting over myriad issues. The management of the pamdemic, decisions on lockdown like a strategic plan for lifting restrictions so that normalcy returned, and allocation of financial resources to the States to adequately meet the health, social and economic challenges that lay ahead. This should have been on the basis of the Federal constitution of India, not about who controlled the purse strings and money.

On 11 March 2020, the Union Government asked the States to invoke superannuated Epidemic Act of 1897 in their jurisdictions, and declared COVID-19 as a 'National Epidemic'. However, the centralisation of power by the Union Government in the span of 10-12 days during the pandemic was rapid and unusual. Use of the Disaster Management Act, 2005

to declare a national lockdown became the cause for worry among the States. In one fell swoop, this Act gave all the powers (administrative and financial control) to the Centre;concentrating one body (the Ministry of Home Affairs) that mostly deals with natural disasters. This imposed a one-size-fits-all strategy to a diverse country, jeopardising the nation's fight against the pandemic, leaving little leeway for the States to act and respond. For instance, Kerala tried to announce its own set of relaxations, especially in COVID-19-free (green) zone as a step for economic revival. The Centre's response was immediate. It overrode the State's decision and instructed all the States to abide by rules and regulations set by the Centre, until an exit plan was announced.

Ideally during the initial phase, a meeting of the Central Council of Health should have been called, to formally discuss the situation and develop a collective strategy with significant inputs from the States. Since health is not on the concurrent list, in crises like these, the platform of Central Council of Health should have been adequately utilised, to ensure that a formal consensus building process, as well as collective action were officially endorsed.

Extraordinary Pressure on State Finances

Ministry of Home Affairs issued advisories/ notifications to all the States and Union Territories from time-to-time, in which it directed them to provide support to the migrant labourers, industrial workers, and those in the unorganised sector impacted by the lockdown. They were also advised to explore measures through various agencies to provide food, shelter and basic amenities for them. States were also asked to provide and make provisions for free food, and other essential items to be given to the vulnerable sections, through the Public Distribution System (PDS). During the lockdown period, the Centre brought into effect the rules and regulations on the economic activities allowed in the States. The States were asked to follow strictly, despite the fact that these aspects were the absolute domain of the States.

The States were feeling vulnerable, particularly financially. The COVID-19 and nationwide lockdown bled out exchequers of all States. The abysmal financial situation of the States, due to crimping revenue sources became a bottle neck in the fight against the disease. Their biggest revenue earners, alcohol and petroleum sales were badly affected during the lockdown phase. According to the study done by PRS Legislative Research on the finances of the various State Governments, Tamil Nadu lost INR 3,736 crore value added tax (VAT) during the lockdown period. The losses were highest among all the States, as 61 per cent of the State's revenue comes from VAT or non-GST sources.

The Centre allocated a mere INR 15,000 crore as an emergency response for the upgradation of health infrastructure, in the States. The emergency response to COVID-19 has resulted in diversion of resources from other essential health services,which isbound to have long-term impact on the health indicators.

The Central Government released Rs 17,287 crore towards State Disaster Mitigation Fund (SDMF) after several States complained of inadequacy of funds to fight the novel Coronavirus outbreak. Out of Rs 17,287 crore, about Rs 6,195 crore has been disbursed to fourteen States, including Andhra Pradesh, Assam and Kerala, as "revenue deficit grant" under 15th Finance Commission's recommendations.

As per the recent RBI report titled *State Finances: A Study of Budgets of 2020-21* released on 28 October 2020, the States have budgeted their consolidated GFD (Gross Fiscal Deficit) at 2.8 per cent of GDP (Gross Domestic Product) in 2020-21. However, the COVID-19 pandemic may alter budget estimates significantly, eroding the consolidated gains secured in the preceding three years. The average GFD for States that presented their budgets before the pandemic was 2.4 per cent of GSDP (Gross State Domestic Product), while the average for budgets presented post-lockdown was 4.6 per cent. By comparison, the fiscal impact of the government's financial stimulus package of Rs 20.9 lakh crore (or 10 per cent of national GDP), announced during the lockdown, is a paltry 0.8 per cent of the GDP, says a DBS Bank report. This estimate is widely corroborated by various experts.

The RBI report further added that the pandemic may also leave lasting scars on federalism in India. States' indebtedness is set to rise, and if it is not accompanied by an acceleration in growth; fiscal sustainability will become the casualty, overwhelming the modest gains of the prudence in recent years. The next few years are going to be challenging for the Indian States. They need to remain empowered with effective strategies to drive through these difficult times. Sub-national fiscal policy has to be judicious and calibrated. Across States, maintaining overall stability, quality of expenditure and credibility of budgets, may distinguish one State's resilience from another.

Inter-State Coordination

The Inter-State coordination was little lackadaisical ever since the pandemic began. There was a growing difference between the States, especially regarding the exodus of migrant workers, as the Central Government shifted the burden of transporting the migrants on to the State governments. There were conflicts between the host State government and the States in which the migrants were working. Migrant labourers native to Uttar Pradesh and many other States were being denied entry in their home state. As a corollary, if States were to refuse accepting migrants from outside their territory without invoking any law, or without specifying a deadline for the same, then their actions would be considered unconstitutional.

On 18 May 2020, Government of Karnataka announced that it would not allow the entry of any people coming from Gujarat, Maharashtra, Tamil Nadu, or Kerala till 31 May 2020 (Kerala was later on removed from the list). Haryana refused to allow the entry of anyone coming from Delhi in the month of May 2020. Tamil Nadu built a wall at its border with Andhra Pradesh, to help contain the spread of the novel coronavirus, and ensured that people strictly followed lockdown measures. The rules, boundaries and bureaucratic actions being imposed were morally unjustifiable in nature, given the agony of the poor.

The cooperation and coordination between the States was another very important factor in building up a strong front against the growing threat of COVID-19. The Centre should have played a pivotal role, especially in ensuring the interstate coordination and learnings among the States. Also keeping into account its global experiences, in order to implement a collective action against the pandemic. Like Kerala's effective management of COVID-19 outbreak and flattening the curve in the initial phase, put forward many lessons to the States, the Centre as well as other countries. Kerala's efforts on contact tracing and surveillance have been truly exemplary, during the initial phase of the pandemic.

Learnings from the 'Kerala Model' During the Initial Phase of Pandemic

The State Government's prompt response to COVID-19 can be attributed to its past experience and investment made in emergency preparedness, including outbreak response in the past during Kerala floods in 2018, and then the NIPAH outbreak in 2019. The State used innovative approaches, and its experience in disaster management planning came in handy; to quickly deploy resources and put up a timely and comprehensive response in collaboration with the key stakeholders. Active surveillance, setting up of district control rooms for monitoring, capacity-building of frontline health workers, risk communication and strong community engagement, and addressing the psychosocial needs of the vulnerable population; are some of the key strategic interventions implemented by the State Government that kept the disease in control.

Early Preparation was the key:

The leadership helmed a robust response to the novel Coronavirus disease very early, following the news of the outbreak in China, in January 2020. The Government declared a health emergency in the State, after two more cases that were confirmed on 2 and 3 February 2020.

Systemic investment in strengthening health infrastructure:

The Government had been systematically investing in strengthening its health infrastructure. During the pandemic, the State Government set-up at least two COVID-19 dedicated hospitals, in each District to treat the positive cases with well-trained staff and team from all the specialities. State and District Medical Boards were constituted, to bring out treatment and discharge protocols and assess each positive case.

Testing and Containment Strategy:

Considering the increase in the number of cases, the State strengthened the surveillance and control measures against the disease. Intense contact tracing and testing were the mainstay of the State's COVID-19 response.

Risk Communication & Community Engagement:

An awareness campaign called 'Break the Chain' was successful in promoting the importance of hand hygiene, physical distancing and cough etiquette. Hand washing stations were installed in strategic locations, including exit and entry points of railway stations etc., to instill a behavioural change. Local self-help groups like Kudumbashree played a significant role in creating mass awareness at the grassroots.

Kerala's model of controlling the epidemic had its roots in the strong health system, which has been built over the years. Kerala's Chief Minister and Health Minister led from the front and facilitated inter-sectoral coordination as well as community participation. They focused on the strategy of trace, test and contain with extensive screening and quarantine of all the incoming travellers. The State and the District Control Rooms played a key role in formulating advisories and guidelines; and guiding the early interventions focused on saving lives.

Source: Responding to COVID-19 - Learnings from Kerala, WHO Document
https://www.who.int/india/news/feature-stories/detail/responding-to-covid-19---learnings-from-kerala

State Capacities and Vulnerability

State capacity or the ability of the State to effectively design and implement public policies, varies greatly across India. Some States like Kerala who have a reasonably good health care system in place, were able to handle the COVID-19 crisis situation on their own. While EAG (Empowered Action Group) States whose health care system and infrastructure are already in pitiable condition, found it tough to initiate an extraordinary response to the current crisis.. There was a need for a tailor-made approach, where the Central Government should have extended additional technical, as well as financial support to these States and capacitated them in effective management of COVID-19. Vulnerability of Indian states to COVID-19, by mapping indicators related to health infrastructure, population demographics, and underlying health issues needed to be taken into account by the Centre, while supporting their existing efforts.

Involvement of Local Communities & other Stakeholders such as NGOs/CBOs

After many decades, we experienced a collective resolve *'Sabka Saath, Sabka Vikas'* to address this challenge between the Centre and all the States, under the leadership of the Prime Minister. We wish similar efforts were made to take the communities into confidence and to reassure everybody that COVID-19 is a serious disease, but can be overcome by strict preventive measures such as wearing masks/handwashing, and death can be prevented in most cases with early medical care.

On 6 April 2020, NITI Aayog, the think-tank of the Union government, wrote to over 90,000 NGOs, international organisations and industry association seeking their assistance in delivering services to the poor & vulnerable section of the communities. The Government seems to appreciate the potential of NGOs in addressing the immediate aftermath of the lockdown. However, the situation could have been controlled in a better way by more proactive involvement of various stakeholders (NGOs/CBOs) by the Government. The need is to foster a complementary and collaborative engagement which looks far beyond.

Community engagement became a missing link in enabling the adoption of and adherence to the government's public health guidelines & strategy. As the communities, panchayats and all the community platforms including Village Health Sanitation Nutrition Committee (VSHNC) were not deeply engaged in this process, much of the work related to implementation of both prevention as well as medical care fell onto the government staff. The administrative staff under the leadership of Collectors, and significant contribution from law and order machinery played a vital role in coping with this pandemic, but it became a top-down management model rather than a participatory effort, which would have actually lessened their burden as well as made our COVID-19 strategy more local, effective and sustainable.

We must learn from effective management of the past public health crisis like Ebola. The most essential aspect, which lead to the ultimate victory over the disease outbreak was motivation, fortitude, and focussed sense of purpose with which health functionaries at all levels, along with the local communities and NGOs took up this challenge. Similarly, eradication of Small Pox from India was possible due to the collective action of local public

health functionaries and the communities, by tailoring interventions which specifically suited the local context.

There is a dire need to reinforce participation of the local communities and other stakeholders (NGOs, CBOs) in our ongoing efforts, especially mobilising their support in the critical hotspots areas. They can augment the Government's effort in public education, care andsupport of the patients as well as their families, while looking after the elderly and vulnerable population. They can also act as a 'Weather Station', updating the district administration on various development.

Indian Health System and COVID-19

In terms of accessibility and quality of healthcare service, the country ranks 145 among 195 countries globally. India spends a meagre 1.28 per cent of GDP as public expenditure on healthcare. Our country has a severe shortage of healthcare workers. According to the Health Ministry data released in October 2019, there is one doctor for every 11,082 people, against the WHO's norms of 1 doctor per 1000 population.

The Health Services of India now happen to be under repair with the implementation of National Health Policy; Ayushman Bharat; Health & Wellness Centre, and setting up of a new All India Institute of Medical Sciences. The huge demand related to COVID-19 has put them under significant pressure in the initial weeks andbrought the health system on the brink of collapse. This resulted in the situation where other National Health Programmes faced setbacks as well. The provision of health services started declining from February 2020, and almost disintegrated in the month of March 2020, affecting a range of services from immunization to restricted inpatient, outpatient and emergency treatment, for infectious and non-communicable diseases, including acute cardiac emergencies.

Similarly, maternal and child health care services have been severely curtailed in the past few months. Disruption in reproductive health and immunisation services, suspension of mid-day meals, use of ASHAs, AWWs for COVID-19 related activities; could aggravate India's malnutrition problem. This is bound to result in adverse consequences for mothers and children especially those facing socio-economic disadvantages. Based on National Health Mission Health Information System March 2020 report, at least 100,000 children did not receive BCG vaccinations. According to the Lancet study released in May 2020, the UNICEF has envisaged that approximately 3 lakh children could die in India over the next six months, due to disrupted health services and surge in child-wasting during the pandemic. It is a body blow to the slow progress made over the decades, to lower malnutrition in the country.

India has the largest number of TB deaths in the world with almost 700,000 deaths due to Tuberculosis every year. It is reported that Mumbai alone has more than 50,000 multi-drug resistant tuberculosis patients. Although India aims to eliminate TB by 2025, the present political and economic focus on COVID-19 could result in a shift in priorities. The current scenario may lead to a loss of earnings and malnutrition, decline in access to TB care and management; leading to an increased incidence of TB. According to the study released by Stop TB Partnership, a UN agency, in May 2020, for every month of lockdown, India may witness an additional 71,000 TB deaths and

A Report by Parliamentary Standing Committee on Health On Government's Handling of COVID19 Pandemic

The response of the Government of India to contain the COVID-19 pandemic and mitigate its impact was officially assessed by the Parliamentary Standing Committee on Health. The report "The Outbreak of Pandemic COVID-19 and its Management" was submitted by the Committee to the Chairman of the Rajya Sabha (Council of States). The report covered various aspects of Government's handling of crisis such as cost of treatment, hospitalisation, out-of-pocket expenditure, surveillance, testing, women health, school going children, elderly care, issues of frontline health care workers and provides clear recommendations to the Government. Main findings and recommendation of the report are as follows:

A. The healthcare spending in the country with a population of 1.3 billion is "abysmally low", he committee, therefore, strongly recommends the Government to increase its investments in the public healthcare system, and make consistent efforts to achieve the National Health Policy targets of expenditure up to 2.5 per cent of GDP within two years; as the set time frame of year 2025 is distant, and public health cannot be jeopardised till the time schedule.

B. The Committee observes that the total number of Government hospital beds in the country is grossly inadequate, keeping in view the rising incidence of COVID-19 cases. Data from National Health Profile–2019 states that there are total 7,13,986 Government hospital beds available in India, which amounts to 0.55 beds per 1,000 population. The Committee is aggrieved at the poor state of healthcare system and therefore recommends the Government to increase the investment in public health, and take appropriate steps to decentralise the healthcare services/facilities in the country.

C. The Committee observes that plethora of guidelines issued by the Ministry, in the course of the containment of outbreak of the pandemic COVID-19, also caused ambiguity in interpretation of multiple guidelines. The contradiction in guidelines and the resultant chaos among the general masses could have been averted by making the public aware of the provision of guidelines, and with the better implementation of the advisories.

D. The Committee is of the view that the unprecedented outbreak of Coronavirus required a well-planned and coordinated decentralised response from the Central as well as State Governments, for successful containment of the pandemic. The Committee is constrained to observe the failure of NCDC-IDSP in generating the required response in the wake of the pandemic. The Committee, therefore, strongly recommends revitalising the enshrined role and responsibility of NCDC, for effective control of the disease and strengthening of the Central Surveillance Unit (CSU), State Surveillance Units (SSU) and District Surveillance Units (DSU).

E. The Committee underlines an urgent need for capacity building and maintaining the pool of health resources to fight against the outbreak of the pandemic. The

Committee strongly supports the demand for the 'Indian Health Service' (IHS) in the Center and across States as a dedicated, efficient, and adequately resourced public health cadre on the pattern of Indian Administrative Service (IAS).

F. The Committee observes that closure of OPD services in government hospitals in the wake of the outbreak of COVID-19, crippled the healthcare delivery system in the country. Non-COVID-19 patients, especially female patients and the patients with chronic and lethal diseases were the worst sufferers. The Committee notes that health machinery was diverted to fight the pandemic, which left the poor public without a healthcare support system. The Ministry needs to work towards establishing a resilient public health system that does not collapse in view of any future outbreaks.

G. The rising COVID-19 cases, inadequate beds in government hospitals, and absence of specific guidelines for COVID-19 treatment resulted in private hospitals charging exorbitant fees. The Committee stresses on the need for timely and better partnership between the Government and Private Hospitals. The Committee points out that the sustainable pricing model could have averted many deaths.

H. The Committee recommends the Government to make all out efforts for the integration of Allopathy with Indian traditional system of medicine.

more than 232,000 TB cases over the next five years. The numbers will drop to 40,685 deaths and 145,000 cases in the months of restoration.

The comparison of NHM data shows that at least 3,50,000 fewer people received outpatient treatment for diabetes & approximately 100,000 fewer people received outpatient cancer treatment in March 2020 as compared to March 2019.

For Government's emergency response to COVID-19, there was diversion of resources from other essential health services, including maternal and child-health services, which were bound to have repercussions in the long run. However, healthcare systems can no longer afford to focus exclusively on COVID-19, oblivious that their response to the pandemic is jeopardising the well-being and life of others.

Another aspect that cannot be neglected is India's over dependence on the private health care system. As per the CDDEP/Princeton study of April2020, India has 43,487 private hospitals against 25,778 public hospitals. Till June 2020, most of the COVID-19 treatment is being done in public facilities but as the epidemic progresses, it will be critical to expand the outreach of healthcare services by involving the private sector, as an equal partner and stakeholder. Despite private hospitals accounting for 62 per cent of the total hospital beds, as well as ICU beds, and almost 56 per cent of the ventilators, they are handling only around 10 per cent of the workload, and are reportedly denying treatment to the poor. This is seen in the state of Bihar, which has

experiencedan almost complete withdrawal bythe private health sector, though they have nearly twice the bed capacity of public facilities. While on the other hand the Government of Maharashtra has taken over 80 per cent of the private hospitals in the State.

Private spending on health Out of Pocket expenditure (OOP) is as high as 70 per cent in India. Many people are grappling to navigate the options between public and private hospital for COVID-19 treatment. Many cases have been reported of patients fleeing from State public run hospitals, due to unhygienic conditions. Many prefer to pay from their own pockets, and get their treatment done from a private facility. During this crisis period, the Government should cap the rates to treat COVID cases, and should leave no scope for arbitrary charging.

Given the dire situation of Indian Public Health System the response to prevent and contain the COVID-19 pandemic required high degree of coordination and systematic efforts, collectively by the Government, private players, the not-for-profit sector along with active participation from the communities.

While the pandemic has brought attention to the inadequacies in the health-care system, the response of the Government of India was steadfast led by our Honourable Prime Minister, including political leaders and Chief Ministers of the respective States. Needless to say, given the significant dilemma; health personnel of various categories (doctors, nurses, lab technicians and frontline workers, etc.) have continued to play an exemplary role in to meet this insurmountable challenges. The unforeseen lockdown and pandemic also reflected the sense of civic duty and solidarity among the citizens to cope up with the pandemic, and a 50-days lockdown.

Preventive Strategy for COVID-19

The main strategy for the prevention and control of COVID-19 stands on three pillars-wearing mask, frequent handwashing and physical distancing. The citizens were constantly being advised by the Governments and health experts around the world including India to follow these measures to halt the spread of COVID-19 infection.

Reinforcing the hygiene routine and behaviour including handwashing & wearing mask when in crowded places are good practices to halt COVID-19 as well as also inculcating healthy habits in a country where more than 30 percent people don't wash their hands with soap and water after defecation. However, there are significant gaps in water, sanitation and hygiene (WASH) facilities at home and even at the community healthcare facility in rural parts and urban slum areas. Access to proper handwashing facilities as well as water needed for handwashing and awareness regarding effective handwashing are critical during times like COVID-19 pandemic.

However, social distancing particularly during the lockdown period in India was almost impractical for certain sections. One of the significant shortcomings in the management of COVID-19, was that we did not keep in mind the reality of Indian Habitat. Almost half of the people had very little scope for social, or physical distancing, as a vast majority of the urban population living in slums and peri-urban areas lack access to basic services including water, electricity, sanitation, solid waste management and housing facilities. In Dharavi slums, Mumbai which has almost 30 per cent more population density than New York, there is only one toilet per 1,440 residents. according to a recent Centre for Sustainability

(CFS) study. Further, 78 per cent of community toilets in Mumbai's slums lack water supply, according to 2019 Greater Mumbai Municipal Corporation survey.

Although there is no short term solution, it clearly points out the underbelly of urban India, where so little has been done to improve the quality of life of the economically deprived sections. However, this pandemic provided great learnings to be utilised as an opportunity to make our urban city plan more inclusive and resilient, helping the urban population, to not only survive the health crisis, but thrive in the post-COVID -19 world. The change in urban settings goes beyond the provision of adequate services in slums. The Government must also work in concerted andmulti—sectoral approach to improve access to education, public health, safety, and economic opportunity for all.

Delayed Testing Behind the Surge

In March 2020, the World Health Organisation (WHO) called on all the countries to increase testing capacity, as the best way to slow the advance of the coronavirus pandemic.

India's testing trajectory is two-pronged. On one hand, India had ramped up its COVID-19 testing since the first test on 24 January 2020 at Pune's National Institute of Virology, from a "one lab, one test" scenario at the start of the outbreak to 1 lakh tests per day in May 2020. This had been further increased to 3 lakhs test per day. as on 1 July 2020.

Yet, India's testing rate is still lower than countries like the U.S. or the U.K. Testing remained India's Achilles heels with huge disparities in the testing rate of the States in the first six months of the outbreak. Maharashtra with the highest case load was conducting 12,081 tests per million people, while Uttar Pradesh stood at 5,369 tests per million as of 17 July 2018. The situation is further accentuated due to delay in test results. There are reports from many States where patient have waited for up to 10 days to get their test results. Delayed test report not only hinders the timely treatment, but also affects contact tracing and breaking the chain of transmission.

India has exponentially scaled up its COVID-19 testing rate from the month of June 2020. One of the reasons for the increased scale of testing has been the introduction of rapid antigen-based testing in June 2020. The WHO recommends 140 tests per million population, per day. As per the Government sources, India's national average of COVID-19 tests per million per day is 844, with at least 12 States performing more tests per million, per day than the national average. As on 10 November 2020, a total of 12,07,69,151 samples have been tested for COVID-19 with more than 1 million tests conducted per day. Test positivity rate (TPR) is an important way to ascertain whether enough test are being carried out. TPR indicates how many people per 100 tested are diagnosed with the virus. It is a powerful tool to measure the spread of virus in a region, at a given point of time. According to the WHO, TPR should be under 5. In India TPR was above 10 per cent as on 1 July 2020. It fell to 8.01 per cent on 14 October 2020 and further down to 7.01 per cent on 16 November 2020. Despite the spike in testing rate, the cumulative TPR for India is above 5 percent (recommended WHO value). The Government need to further increase the number of COVID-19 tests to bring the TPR below 5.

Ramping up the testing rate using a systematic approach was not be difficult in big cities like Delhi, Mumbai, which are overwhelmed with the exponential increase in COVID-19 infection since the beginning. Rural areas are emerging as New COVID-19 hotspots. Testing remains a real challenge in the small cities and rural parts of our country, where healthcare infrastructure and services are in a dire situation, while people are struggleo support themselves due to the prolonged economic slowdown.

The Centre should consider strengthening of the testing and medical care facilities through PHCs, CHCs and HWCs. There is an urgent need to develop a robust referral system from HWCs or PHCs to CHCs/rural hospitals and the nearest COVID-19 testing and treatment facilities. To stall COVID-19 spread in the rural areas, apart from the ramping the testing facilities, there should be systematic efforts to equip the Gram Panchayats and Village Health Sanitation Nutrition Committees. They should be equipped to handle the outbreak in close coordination with the local administration, such as management of quarantine centres, awareness, and provision of hand washing facilities.

Emergency Supplies: Initial Shortage, Subsequent Surplus Production

Personal Protective Equipment (PPE), especially the mask and coveralls, are mandatory under WHO guidelines for COVID-19 prevention and treatment. On 31 January 2020, the Centre had banned the export of PPEs. However, export of raw material for PPEs was continued, unchecked till 19 March 2020.

Formal complaints were filed by doctors and health care workers about PPE shortage, which was caused due to disrupted global supply chain in March-April 2020. In order to address this crisis, Government ramped up India's capacities to manufacture PPE kits and ventilators, in collaboration with private players.

According to the Government data, in June 2020 India manufactured an estimated of 6 lakh PPE kits and around 1,000 ventilators daily, with production of PPE outpacing the domestic demand and with prices slumping from Rs. 1,500 to Rs. 300 per kit.

India became the second-largest manufacturer for PPE kits within two-three months, undoubtedly a big achievement in a short span of period. Thus, the collaborative partnership of the Government, businesses and multiple stakeholders helped to turn this crisis into golden opportunity for domestic manufacturers. It has displayed that the self-reliance in high quality products is an achievable goal.

Environmental Concerns due to COVID-19 Waste

Almost six months back, the Government was thinking of a plastic-free India. However, the proper disposal of protective gears used by health care workers daily, and that which is essential for fighting the COVID-19 crisis, remains a big challenge. This waste is slowly piling up an environmental crisis.

Apart from the PPE and biomedical waste generated at the medical facilities, the discarded masks at the household level often end up being mixed with other household wastes, be it the organic or the recyclables.

As per the guidelines issued by CPCB, it is the responsibility of all the State Pollution Control Boards to keep a record of all the COVID-19 facilities and ensure proper collection and disposal of the waste. There are many lapses on the ground level in the implementation of Biomedical Waste Management Rules, 2016.

In some States the required facilities don't exist at all. While in others, even contractors have not been appointed yet, nor have the incinerators been upgraded that are essential to burn highly infectious waste, at the right temperature so that it doesn't emit toxic gases.

Therefore, in order to deal with this pandemic properly and avoid environmental crisis, the citizens will have to be responsible with the waste that is generated and not dispose it casually. The Government on the other hand needs to ensure proper collection and disposal of the waste.

Way Forward

The COVID-19 pandemic has shown us that effective preparedness is key to averting such health and humanitarian criseses in future. It is thus crucial to consider investment on health care services as a public good and act decisively, by increasing the Government Public health expenditure to at least 2.5 per cent of GDP, as envisioned in National Health Policy 2017.

The need of the hour is adequate investment for strengthening the primary and secondary health infrastructure, as well as service delivery systems with special emphasis on Health Promotion and Disease Prevention, along with the tertiary care.

This pandemic is also a trumpet call for assimilation of latest health technology and raising of skilled health workforce into the public health system. It is equally important to shift our approach from bio-medical reductionist model, to more holistic health care system by mainstreaming AYUSH and its integration with the modern system of medicine.

Past evidences of handling HIV/AIDs and present experience with the COVID-19 pandemic further reiterates that we need to act together - *'Sabka Saath Sabka Vikas'*. In the long run, the Government needs to adopt a strong multi-stakeholder decentralised approach, with pro-active involvement of local communities, NGOs and private stakeholders.

Role of Key Organisations in the Management of COVID-19 Pandemic

The COVID-19 pandemic is continuing its spread across the world, with more than 40 million confirmed cases, and in excess of one million deaths. As the world continues to battle and in fact, understand the coronavirus pandemic that has hit almost 210 countries and territories, one thing is clear for sure, we were far from being fully prepared for a calamity of this scale. The response of governments across the world has been varied, but unprecedented.

India, home to 18 per cent of the world's population was no different. To face this unprecedented challenge, various stakeholders governments, organisations from across industries and sectors and individuals are coming together to help respond to this global outbreak. The Indian Government (Central and State level) is making efforts to minimise the number of cases and consequences every day, and is taking all necessary steps to combat the challenges and threat posed by this growing invisible pandemic war involving public, medical association, nurses, NGOs, police forces, including paramilitary. In India, key organisations such as ICMR, IDSP, NDMA and various other departments have played active role in combating COVID-19.

ICMR (Indian Council of Medical Research)

ICMR is the apex body in India for the formulation, coordination and promotion of bio-medical research. It promotes bio-medical research in the country through intramural, as well as extramural research. Overall, ICMR's research agenda aligns with the national health priorities, with a view to reduce the total burden of the disease, and to promote health and well-being of the population.

Role of ICMR in COVID-19 Management

To combat COVID-19 since the reporting of the first case, ICMR has been strategising to prevent the spread, as well as to provide timely treatment. It has also ensured that the desired facilities are available on the ground. The organisation has emphasised on increasing awareness, use of mask, sanitisers and social distancing for prevention. Further, it took cognisance of effective medicines, conducted thorough research, and shared the information with doctors across the country. As a result of ICMR's policy level interventions with the health ministry, RT-PCR, Elisa Test and Rapid Antigen tests are being used across the country, for detecting and combating the outbreak of COVID-19. Apart from testing, ICMR has also facilitated monitoring the spread of COVID-19 through sero-surveillance.

1. Role of ICMR in Diagnosis and Testing of COVID-19:

In the preparedness for the COVID-19 outbreak in India, ICMR-National Institute of Virology (NIV) served as the apex laboratory, to optimise the conventional and reverse transcription polymerase chain reaction (RT-PCR) assays, targeting different genomic regions of SARS-CoV-2, and initiate testing of suspected cases.

The Department of Health Research (DHR) / ICMR initiated establishment of a network of public health laboratories (VRDLs), to enhance capacity for diagnosis and detection of viruses of public health importance, in the Indian setting. Keeping this in mind, ICMR has already certified over 1,700 labs in both public (1,046) and private sector (650), across India for COVID-19 testing.

2. Defining Testing Strategies:

Existing strategies for COVID-19 testing:

a) **RT-PCR** is the gold standard test for detecting cases of COVID-19. The test requires specialised laboratory setup with specific biosafety and biosecurity precautions to be followed. Average time taken is around 4-5 hours from receipt of sample, to getting the result, as well as has the ability to run upto 90 samples in a single run. While this test can be performed in only those district level labs that have molecular virology facilities, it is considered the frontline test for diagnosis of SARS-CoV-2.

b) The **TrueNat** and **CBNAAT** systems have also been deployed for diagnosis of COVID-19, in view of availability of customised cartridges. These platforms have widespread availability, even at district and primary health centre level, as these platforms are widely used for diagnosis of Tuberculosis, and other infectious diseases.

c) All COVID-19 tests conducted through RT-PCR, TrueNat and CBNAAT are reported on ICMR data entry portal, which helps in drawing the national estimates on numbers of tests conducted, numbers of positives, tests conducted per million population etc. It is the single national source of data entry, which is accessed by all relevant Ministries / Departments for defining national strategies for COVID-19.

3. Fast Track Approval for Indian COVID-19 Testing Kits, for Commercial Use:

Only test kits with 100% concordance among true positive and true negative samples have been recommended, for commercial use in India. In line with this, ICMR has recommended two RT-PCR test kits for use in ICMR approved government, and private laboratories.

4. National Community Based Sero-Survey for COVID-19:

ICMR in collaboration with Department of Health and Family Welfare, Government of India and National Centre for Disease Control, with support from State health departments and key stakeholders including WHO, is conducting a community based sero-survey, to estimate the prevalence of SARS-CoV-2 infection in Indian population.

The survey is coordinated by ICMR's National Institute of Epidemiology (NIE) and National Institute of Research in Tuberculosis (NIRT), Chennai. The results of the survey will provide information about spread of SARS-CoV-2 infection, in different parts of the country. Ministry of Health and Family Welfare is also initiating hospital-based surveillance to monitor the trend of infection in all districts.

5. India COVID-19 Clinical Research Collaborative Network:

The National Task Force has recommended establishing the "India COVID-19 Clinical Research Collaborative Network" to be coordinated by the ICMR. The goal of this network is to enhance the clinical understanding of COVID-19 in the country, so as to develop specific clinical management protocols and further R&D for therapeutics. For this purpose, a central database of clinical and laboratory parameters of hospitalised COVID-19 cases are being created. All hospitals currently managing COVID-19 patients are invited to become partners in the network.

6. COVID-19 Vaccine Development:

The COVID-19 vaccine candidate, Covaxin, developed by the Hyderabad-based Bharat Biotech, in collaboration with the ICMR and the National Institute of Virology; has shown safety and efficacy in the phase 1 and 2 trials and in the animal studies. Its last stage trials begin in November 2020, and there is hope that it could be launched as early as February 2021, much earlier than expected.

7. Development of COVID-19 Vaccine Information Portal:

In September 2020, ICMR launched a dedicated vaccine portal, to provide information and updates related to the COVID-19 vaccine development in India and abroad, with the majority of the updates in several regional languages in addition to English.

Critique of ICMR's Role

1. **Testing Protocols:** The first case of COVID-19 in India was reported in Kerala, on 30 January 2020. In the initial phase, ICMR's testing guidelines had testing limited only to international travellers and their contacts, while international health agencies like the World Health Organisation (WHO) had advised countries to escalate tests across swathes of population. ICMR revised its protocols only in May 2020, to adding tests beyond those who had travelled to countries with a high caseload, or may have come in contact with COVID-19 patients. It broadened the criteria to asymptomatic patients, and migrant workers who had by then traversed long distances and were possible spreaders through their journey. However, by the time revised guidelines came into practise the damage was done, with the virus being recently reported even from the Andaman and Nicobar islands. Test, trace, isolate and treat — the most acceptable strategy to keep a virus at bay was adopted too late.

2. **Issues related with Imported test kits: High Markups and, then, Failure:** ICMR ordered Chinese rapid antigen test (RAT) kits in March 2020, two months after the first reports surfaced in a few states, and as number of cases continued increasing, The test kits imported initially were found to be of poor quality, and high price forcing ICMR to cancel the order. It shows deficiencies in quality check of the kits.

3. **Private Lab Tests Priced High:** In late March 2020, ICMR recommended a ceiling price of INR 4,500 per RT PCR test, noting that its panel of experts had assessed the

costs for such tests before arriving at that figure. By letting private labs fix high rates, the agency may have kept patients away from getting themselves tested. Nations like Korea, Taiwan, and Singapore, which ramped up tests early, fared much better in containing the spread of the infection. India missed out on an early and easier intervention, while a handful of private labs gained.

4. **Confusion on Stage of Transmission:** All through the alarming rise in India's caseload, ICMR maintained that there was no community transmission. This was contrary to the opinion shared by many experts and even WHO, which believed India to be in the stage of a community transmission. However, the apex body held on to the view that only clusters in certain crowded localities of metro cities, were seeing a spread of the virus. While local municipal authorities doubled down on containment strategies, regardless of the nomenclature, an acceptance of a "community transmission" would have helped raise the level of alertness among the citizens.

5. **Lack of Data Transparency:** ICMR is being criticised for not sharing the data behind its various reports including, sero-surveillance reports.

6. **Vaccines by 15 August 2020:** ICMR was widely criticised for its perceived instructions to fast track trials, for the approval of the vaccine by a cut-off date. In early July 2020, Balram Bhargava, the Director General of ICMR, said in a letter: "It is envisaged to launch the vaccine for public health use latest by 15 August 2020, after completion of all clinical trials. In view

of the public health emergency due to COVID-19 pandemic and urgency to launch the vaccine, you are strictly advised to fast track all approvals related to initiation of the clinical trial, and ensure that the subject enrolment is initiated no later than 7 July 2020."

From delay in scaling up tests and ordering faulty test kits from China, to sharing misleading data and approving therapies that lacked evidence, the ICMR took decisions that defied the cautionary signals from global health agencies and prominent epidemiologists. This led to failure in curbing the viral outbreak.

IDSP (Integrated Disease Surveillance Program)

Formulated in the wake of the outbreak of SARS-CoV in 2004-05, the Integrated Disease Surveillance Program (IDSP) is the flagship programme under the National Centre for Disease Control (NCDC), for disease-based data collection, information dissemination, and data analysis. It was initiated in assistance with World Bank to strengthen disease surveillance for infectious diseases to detect and respond to outbreaks immediately through Rapid Response Team (RRTs). The Programme includes following components:

1. Integration and Decentralisation of Surveillance Activities Through the Establishment of Surveillance Units at Centre, State and District Level

This component includes surveillance and contact tracing through IDSP, for tracking travellers in the community who have travelled from affected countries, and to detect clustering, if any, of acute respiratory illness. This involves active, as well as passive surveillance to track cases. Contact listing to map the contacts, and determine the potential spread of disease. Mapping of the containment and buffer zones to identify the health facilities, and available workforce. Perimeter control by the District administration to control the spread of disease.

2. Human Resource Development

The capacity building of staff includes; training of State Surveillance Officers, District Surveillance Officers, Rapid Response Team and other Medical and Paramedical staff, on principles of disease surveillance.

3. Developed Information Communication Technology (ICT) for Collection, Collation, Compilation, Analysis and Dissemination of Data

Risk communication material comprising of (i) posters and pamphlets; (ii) audio only material; (iii) AV films prepared by PIB/MoHFW for targeted roll out in the containment and buffer zones.

Communication channels are kept active, through mass communication awareness among the community through miking, distribution of pamphlets, mass SMS and social media. A dedicated helpline number is provided at the Control room (district headquarter), to bring COVID-19 related awareness among community. Control room at State and District Headquarters manned by State and District Surveillance Officer (respectively), under which data managers (deployed from IDSP/ NHM) are responsible for collecting, collating and analysing data from

districts for providing diagnostic services for epidemic-prone diseases during outbreaks. Presently this network is functional in 23 States/UTs involving 108 labs.

Strengthening of Disease Surveillance In India: Limitations and Recommendations

From most assessments of the IDSP's performance, it appears to have weak institutional and financial support, a chronic shortage of personnel and expertise, and a lack of statutory backing. These factors, bolstered by the overall quality of healthcare infrastructure in India, hinder 1.3 billion people from availing the benefits of a comprehensive disease surveillance programme. This cost India dearly when, COVID-19 pandemic struck.

Currently, the NCDC is playing second fiddle to the ICMR in combating the COVID-19 pandemic. This is not surprising, given the advantages the ICMR enjoys over the NCDC with regards to greater financial support and qualified personnel. The NCDC continues to assist the ICMR in tackling the COVID-19 pandemic, but it is through the IDSP that it collates and tracks data on diseases.

Questions arise as to why isn't the IDSP equipped to handle disease outbreaks like COVID-19? Why has the ICMR been handed the reins for managing a national pandemic? The overarching reason boils down to a predictable answer: poor funding and lack of professional staff.

a) **Poor Funding**: The IDSP is underfunded, and whatever funds it does receive are not always utilised. Between 2005 and 2018, its annual expenditure was less than its allocated budget for 11 years, out of 13.

With annual spending of 57.13 crores of 68.3 crores allocated in 2018, the IDSP was under equipped even before the COVID-19 pandemic. The underwhelming financial support is reflected in the capacities of the institution.

b) **Shortage of Human Resource**: In a letter by Health Secretary, Preeti Sudan on April 7th, which revealed a total of 382 vacancies in the IDSP, of which 216 were for district-level epidemiologists. It further stated that shockingly, 11 Indian states had no state-level epidemiologist at all. This shortage of personnel has been a longstanding issue for the IDSP. Back in 2013, a World Bank Independent Evaluation Group review of the IDSP's performance found that only 127 out of 231 positions for epidemiologists were filled at the time. The review also indicated substantial difficulties faced in the procurement of adequate equipment. The situation has remained the same since 2015. A joint monitoring mission by the World Bank and Ministry of Health and Family Welfare (MoHFW) found that there was a 42.1% shortage of epidemiologists, a 32.9% shortage in microbiologists, and a 77.8% shortage in veterinary consultants.

Given all these shortcomings, John T. Jacob, a prominent virologist, has stated that the IDSP is currently only capable of meeting the disease surveillance needs of a small country, not India's. Yet, in spite of the real capacity constraints it faces, for over a decade, the IDSP has still been held responsible to track and trace multiple communicable diseases across the country. Following are a few **recommendations to strengthen IDSP's functionality:**

a) **Statutory status**: In a post-COVID world, it is certain that organisations like the IDSP will perform a critical role within healthcare systems globally. In light of this increased responsibility, IDSP may be given a statutory requirement for all states. This could bring uniformity in data collection, surveillance operations, and accuracy in the identification of diseases across states.

b) **Digitising disease surveillance**:

Additionally, the IDSP can augment its surveillance capabilities by incorporating internet search trends, and social media analysis in urban centres into its analyses. To improve India's disease surveillance, the implementation of India's Integrated Healthcare Information Platform (IHIP) in 2016 has endowed its healthcare infrastructure with the capacity to detect outbreaks, in real-time. The IHIP collects disease data from public and private hospitals, to provide real-time information on disease incidence across India. While the IHIP has the potential to strengthen India's real-time data collection mechanisms, the focus must now shift to training and equipping disease surveillance personnel.

NDMA (National Disaster Management Authority)

The legislative intent of the Disaster Management Act (DM Act) was to, "provide for the effective management of disasters". The National Disaster Management Authority (NDMA), under the DM Act, is the nodal central body for coordinating disaster management, with the Prime Minister as its Chairperson. The NDMA lays down policies, plans and guidelines for management of disaster. Similarly, State, District and Local level Disaster Management Authorities were established, manned by high functionaries. All these agencies are envisaged to work in coordination.

NDMA so far formulated 30 Guidelines on various disasters including the 'Guidelines on Management of Biological Disasters, 2008'. The 2019 National Disaster Management Plan, issued also deals extensively with Biological Disaster and Health Emergency. This is the

broad legal framework within which activities to contain COVID-19, are being carried out by the Union and State governments.

The present national lockdown was imposed under DM Act as per Order dated 24 March 2020 of NDMA 'to take measures for ensuring social distancing, so as to prevent the spread of COVID-19'. Additional guidelines were issued on the same day by the Ministry of Home Affairs; the Ministry having administrative control of disaster management.

To alleviate social sufferings, NDMA/SDMA are mandated to provide 'minimum standard of relief' to disaster affected persons, including relief in repayment of loans, or grant of fresh loans on concessional terms.

Role of NDMA

1. Issue of Advisory Regarding Support to Migrant Labourers

The MHA issued advisories to all States and union territories from time to time.

States were directed to provide support to migrant labour, industrial workers, and those in the unorganised sector impacted by the 21-day lockdown; to explore measures through various agencies to provide food, shelter and basic amenities for them. States were also advised to make provisions for free food, and other essential items to vulnerable sections through the public distribution system (PDS).

The MHA also responded to the emergent situation arising out of the movement of migrant labour, across states and directed State governments to set up relief camps for them to stay till the lockdown is lifted. Social distancing was to be observed even in the designated shelters. States were authorised to use funds available with the State Disaster Response Fund.

The MHA emphasised the necessity of ensuring the adequate arrangement of temporary shelters, and provision of food for the poor including migrant labour stranded due to lockdown, and directed that employers in industry, shops and commercial establishments are mandated to make payment of wages to workers at their work places, on the due date without deduction during the period of lockdown. Directions were also issued in favour of tenants. Section 10(2) of the Act is allegedly the source of power for issuing such directions.

2. Issue of Advisory and Assigning role to SDMA and DDMA for Providing Support in Situational and Resource Awareness

- SDMA/SEOC has been made the nodal point of information and management of disaster, with particular reference to non-medical matters.
- SDMA/DDMA has been given responsibility to create awareness about the government orders and schemes, among weaker sections of the society as well as to the migrant labourers and tourists stranded. In addition to this, SDMAs have been given responsibility to coordinate with NGOs, neighbouring states and industries to facilitate CSR activities.
- SEOC has been made a single point contact for all migrant workforce related issues. They will be taking care of local shelters, and should also ensure the adherence to social distancing norms to be followed in the shelter homes.

3. Use of State Disaster Response Fund for paying wages

The MHA issued advisory stating employers in industry, shops and commercial establishments to make payment of wages to all workers on the due date. This is because under the Act, it

is the responsibility of the Union government to ensure that during the period of lockdown, as a relief measure, salaries are paid out of the funds available with the Union.

4. Demonstration of State Level Models for Combatting COVID-19

- In **Sikkim**, establishment of Economic Welfare Schemes for provisions of immediate relief for the economically weaker sections of the Sikkim's population, were arranged. This included; food distribution for all needy families, over and above their Public Distribution System (PDS) entitlement, daily wagers, migrant, casual or construction site workers, hawkers and those stranded and in need of immediate help, whether in bazaars/ more populated areas, or rural areas. Financial provisions were also made for employees engaged in work during the lockdown period. In addition, a decision was made for the provision of insurance, for frontline workers.

- Actively engaging the community has been a notable feature of **Kerala'**s response strategy. To ensure people strictly complied to 'home-quarantine', neighbourhood watch initiatives were in place and a WhatsApp number was created by the district administration, which the public used to report violators. For surveillance, police used drones for surveillance, not only to enforce the lockdown, but also in identifying the production of spurious liquor and sale of drugs. The on-ground surveillance systems were community-based involving elected representatives of local governments, members of the self-help group (SHG) called 'Kudumbashree' and the people who came forward and volunteered. Community kitchens were also set-up by the local governments with

the support of 'Kudumbashree', to ensure cooked meals were readily available to the needy. To spread awareness, the Kerala police disseminated colourful videos on social media, about social distancing and hand-washing, set against the music of a popular Malayalam film. Another effort was the police intervention in the colonies housing the migrant labours (Guest Workers), checking on the facilities given to them, tying up on their provisions, encouraging them, and keeping them engaged without any violence.

- **Maharashtra** established dedicated COVID-19 care booths in hotspot areas, and allotted dedicated ambulances. Localised teams carried out door-to-door check-ups of all households, in the hotspot areas**.** Standard operating procedures were developed for Maharashtra, and the Police developed a pyramidal reporting structure that was managed through Whatsapp groups. It designated 7,500 Special Police Officers (SPO) with some specific powers to help the police to manage micro-clusters, places with high population density, and over five positive cases. The municipal corporation displayed helpline numbers at all prominent locations. They established two-way communication channels for community and public information sharing, such as 24X7 hotlines (available via text and phone-calls) and responsive social media and radio shows, with systems to detect and rapidly respond to and counter misinformation.

- In **Odisha**, seven million women of Mission Shakti have taken the lead in crucial initiatives, responding to the pandemic, helping contain the spread of the virus providing various community services. SHGs helped implement the 'Mo

Jeevan' pledge to all habitations across the state, educating 15.3 million persons, so as to break the chain of contact. These groups also produces masks. In addition, these groups were involved in setting up dry rations, vegetables and fruit shops across the state with the help of district administrations. This ensured the financial stability of farmers and SHG workers, along with food security at a time of crisis. For tackling the huge influx of migrant workers, special efforts such as a single unified portal for registration, contact tracing, monitoring health and compliance with quarantine norms, and online e-pass were adopted. It also helped in challenging gender stereotypes.

- **Madhya Pradesh** devised community-based surveillance tools such as SARTHAK LITE, a citizen app, and COVID Rakshak, a system involving citizen volunteers who red-flag and report the persons who may have been exposed to the virus through community based action, leveraging technology. SARTHAK LITE enables citizens to access real-time, accurate information pertaining to collection centres, fever clinics, CCCs, DCHCs and DCHs in their vicinity. COVID Rakshak uses the pulse oximeter to report citizens whose oxygen saturation levels may be less than 94% and thus are in need of immediate medical examination and care. With these tools, the state aims to broad-base surveillance, transforming it from a predominantly institutional use, to a more community-based activity. Some police stations have become food hubs, working in concert with civic bodies to combat hunger. In Indore, police stations have spread awareness about COVID-19 through women's volunteer groups. Senior officers have roped in local volunteers

to visit homes of the elderly and provide food grains and medicines. Collaborating with charities, police vehicles carrying soap, water, and food have made rounds to distribute these items to street dwellers. Similar efforts were also made in Ujjain, Gwalior and Jabalpur.

- In states like **Jharkhand**, technology has been essential. App-based reporting of essential healthcare services was initiated, with the aim of resuming the regular services and care provided by healthcare workers, in continuation of COVID-19 response activities. In Jharkhand, TruNat stations were established at all the CHCs which will empower TB testing as well at the CHC level. At present, more than 1,000 tests are being conducted on a daily basis. All together, 52 TruNat machines may test up to 1,500 samples every day. All districts have been provided with a confirmatory ASSAY for TruNat test, making them self-sufficient to detect true COVID-19 positives. This has facilitated local testing with ease and convenience, to deal with emergencies and quick testing requirements for pregnant women, emergency cases and in re-testing of already positive patients towards releasing them.

- **CO-BOT:** In COVID-19 hospitals, the CO-BOT deliver medicine, food and water to patients, without requiring health workers and ancillary staff to attend to COVID-19 patients in person. The CO-BOT, which can move freely and operate remotely, is fitted with a camera which has a microphone that allows for two-way communication. The doctors can monitor patients without getting too close to them, and can easily pass on necessary instructions over the microphone. Another feature of the CO-

BOT is that it will serve food, water and medicines with less chance of spreading the lethal infection. A doctor or nursing staff can check if the patient picks up the correct medicines or not, monitoring them remotely. The cameras can also keep vigil over the interaction between patients in the isolation wards. The speaker will enable staff to communicate with the patient, and the patient can air his/her grievance through the speaker and microphone.

• In the Bhilwara district of **Rajasthan**, which has gained early praise for controlling the spread of COVID-19, the police enforced a "maha-curfew" to limit discretionary rule-breaking by individuals in coordination with municipal agencies to plan, stock supplies, and build delivery systems to assist citizens.

• **Delhi** Police set up an isolation centre for its personnels who show symptoms of the disease, and have no permanent residence in the city. At this facility, each cop is provided with a basic hygiene kit.

The unprecedented crisis of the COVID-19 pandemic has provided the sternest test for Disaster Management response in most countries, including India. India's Disaster Management Framework has evolved over the past many years with a dedicated legal and policy framework. Yet, it suffers from ambiguity. The provisions mentioned in the guidelines, policy, and plans of the Disaster Management Framework not only lack coherence with each other but also with the official delegation of governance responsibilities to various ministries.

Although the initial response of the Government of India aligned closely with the BDM guidelines, as reflected in the lockdown and social distancing guidelines, many of its provisions were not implemented optimally. The most important among them were those specifically related to disease surveillance guidelines, and provision of essential supplies and services to ensure successful social distancing. Both these measures were important in early containment of the disease outbreak, an objective that India failed to achieve.

The parameters of disease surveillance and the key agency to coordinate it have remained mired in controversy and ambiguity throughout the crisis. The provision of essential supplies and services was not ensured from the beginning and suffered from inadequacy later as well, which resulted in the massive exodus of migrant workers from cities, to their hometowns and villages.

There have also been inadequacies in the Disaster Management Framework itself, including the BDM guidelines. Adequate measures to ensure economic sustenance, such as employment generation and cash transfer schemes, have not been incorporated in the Disaster Management Framework. The nature and life cycle of a pandemic is different from all other disasters and, thus, it response differs as well. A pandemic is far more unpredictable and long-lasting than other disasters.

Support Provided by Police Forces

The police are a primary port of access to State services, and the lockdown brings officers into regular contact with citizens needing urgent assistance. Police officers are also at the forefront of India's public health campaign, providing information and essential supplies.

Photo Source - STR_AFP via GettyImages

A police officer rides a horse covered with coronavirus-themed paintings as he speaks to the public during a government-imposed nationwide lockdown against the COVID-19 coronavirus, in Peapally Mandal village of the Kurnool district in Andhra Pradesh state on March 30, 2020 (by Shefali Anand-US NEWS)

After the lockdown order, police agencies aggressively enforced social distancing through patrolling vans, foot patrols, and vehicular checkpoints. District police chiefs have created COVID-19 emergency phone lines to respond rapidly to citizen needs. Outside some stations, banners have been posted to communicate the importance of social distancing and hand washing.

Role Of Central Armed Police Forces (CAPF) during COVID-19 Pandemic

The Central Armed Police Forces (CAPF) gallantly protect the borders of the nation from external aggression, and infiltration and assist the state governments, aiding in internal security, including law and order, insurgency, anti-naxalism and counter terrorism. In the wake of COVID-19, these forces have been actively involved in various roles to ensure public health services for the public.

The Indo-Tibetan Border Police (ITBP)

was the initiator of efforts against COVID-19 among the CAPF. The ITBP's Chhawla quarantine centre in Delhi, was set up to test and treat passengers arriving at Delhi's IGI Airport from all over the world, including Wuhan. More than 1,200 people were treated here. The ITBP was the first to create standard operating procedures for hospital and quarantine running and distributing it to other forces. Good quality PPEs and three layered masks were prepared, and used for the force personnel as also distributed to various authorities to meet the initial scarcity. ITBP formations are providing food, drinking water

and medicines to the local population, in their area of operation, and thousands of people have benefited from this.

The Border Security Force (BSF)

has, apart from taking special care of their personnel, have distributed ration and essential items amongst daily wage labourers, helped the needy in remote areas, organised medical camps for corona virus, distributed masks prepared by BSF tailors, created awareness on social distancing, and basic sanitation, and also have done screening for COVID-19.

The Central Reserve Police Force (CRPF)

personnel have been imparting yoga classes to children, and distributing food packets to the needy in their villages.

The Central Industrial Security Force (CISF)

(CISF) is augmenting COVID-19 protective gear and health care equipment for all its personnel who are stationed at the airports and Delhi metro. Social distancing protocols, without security being compromised are being worked out. Isolation facilities in all CISF units have been created. The personnel on frisking duty will be wearing PPE suits.

The National Disaster Response Force (NDRF)

has been training personnel at land, sea ports and airports, to handle in-bound passengers and create awareness. As part of its response mechanism duties, it is also assisting states in creating awareness about COVID-19. Mock drills have been carried out for preparedness for any eventuality. The NDRF teams are also deployed on routes taken by migrant workers, heading for U.P. and Bihar, and helping out

stranded people, in coordination with the state administrations. The NDRF has further been providing sanitisers to these migrants.

The Railway Protection Force (RPF)

has also been distributing food packets from their own resources. All the forces have augmented their efforts and ensured social distancing norms among their personnel, as also made standard operating procedures, issued by the government within their forces. All forces have made full efforts in community work and distributing essential items to the public, in their respective areas of operation. Isolation wards have been also been made, in the composite hospitals of these forces to cater for COVID-19 patients.

Lessons for the Future

The police force, as one of the sentinels of democracy, should be applauded and encouraged for being a crucial interface between the government, and the public at this time of national emergency. However, there are three lessons for the future.

First, police training schools should include medical emergency and police responses in their syllabus, which would call for a paradigm change in protocols and accoutrements.

Second, with the police force stretched to the maximum, there is an acute need for private security guards to be trained and empowered. When the lockdown was imposed, police officials were seen walking around the parks with megaphones, sensitising the crowds about COVID-19, a job that security guards could have done. In fact, a variety of tasks performed by the police today can be done by private guards under supervision.

Lastly, communities or clusters which organise themselves well through self-discipline, emerge from such crises unscathed and stronger. Some resident welfare associations in Delhi and Gurgaon have already proven this, though it is crucial they follow the law, don't act arbitrarily, impose draconian restrictions and harass community members.

NITI Aayog

The National Institution for Transforming India, also called NITI Aayog, is the premier policy think tank of the Government of India, providing both directional and policy inputs. While designing strategic and long term policies and programmes for the Government of India, NITI Aayog also provides relevant technical advice to the Centre and States. The Governing Council of NITI, with The Prime Minister as its Chairman, comprises Chief Ministers of all States and Lt. Governors of Union Territories (UTs).

The Government of India constituted the NITI Aayog in 2015, to replace the Planning Commission instituted in 1950. This was done in order to better serve the needs and aspirations of the people of India. An important evolutionary change from the past, NITI Aayog acts as the quintessential platform of the Government of India, to bring States to act together in national interest, and thereby fosters Cooperative Federalism.
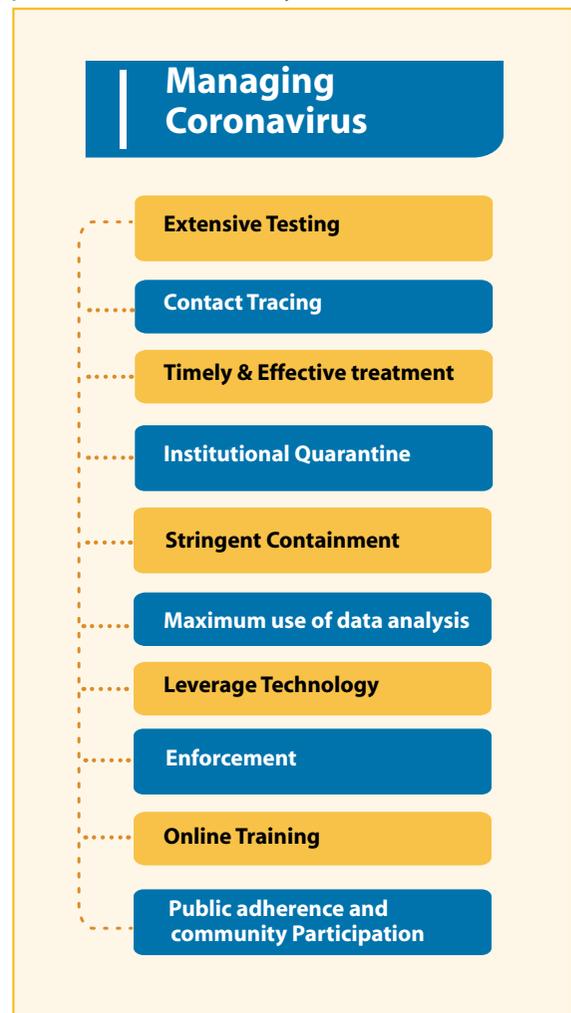
NITI Aayog Reports & Articles

COVID-19 In India: A SWOT Analysis:

This analysis examines India's Strengths, Weaknesses, Opportunities and Threats on the COVID-19 front, and aims to come out with recommendations that can help battle the crisis. This will also act as the foundation for various stakeholders to pursue, and convert opportunities into strengths and prevent weaknesses from turning into threats. This report was contributed by NITI Aayog young professionals.

Managing Coronavirus: Learning From Global Best Practices:

This article by Amitabh Kant, CEO NITI Aayog tries to identify the best practices behind the success of some countries, as well as states within India and recommends that we must strive to emulate these best practices in a bid to bolster our efforts against COVID-19. Some of the best practices mentioned by him are:

Managing Coronavirus

- Extensive Testing
- Contact Tracing
- Timely & Effective treatment
- Institutional Quarantine
- Stringent Containment
- Maximum use of data analysis
- Leverage Technology
- Enforcement
- Online Training
- Public adherence and community Participation

National Expert Group on Vaccine Administration for COVID-19

The Government has set up a National Expert Group on Vaccine Administration, for COVID-19. The purpose of the group is to keep India in the forefront of any ongoing effort worldwide to innovate, prepare, produce and launch candidate vaccines to deal with the COVID-19 pandemic, for India and for the world. The group is chaired by Dr V K Paul, Member NITI Aayog along with Secretary (Ministry of Health and Family Welfare) as Co-Chair.

Empowered Groups Constituted under Disaster Management Act

Considering the gravity and magnitude of the challenges, posed by COVID-19 there is a pressing need to augment and synchronise efforts cutting across various Ministries/ Departments. Keeping in view the need for such comprehensive action and integrated response, The MHA constituted eleven Empowered Groups of Officers. These Groups are empowered to identify problem areas and provide effective solutions therefore; delineate policy, formulate plans, strategise operations, and take all necessary steps for effective and time-bound implementation of these plans/ policies/ strategies/ decisions, in their respective areas. NITI Aayog member, Dr V K Paul is heading the Group no. 1 on Medical Emergency Plan, while its CEO, Mr. Amitabh Kant is chair of the Group no. 6 on 'Coordinating with Private Sector, NGOs & International Organisations for response related activities'. Dr V K Paul is also member of Group no. 11 on 'Strategic issues relating to Lockdown'.

Call to Doctors to Work as Volunteers for COVID-19 Outbreak

The Government of India requested for volunteer doctors who are fit and willing to be available, for providing their services in the public health facilities, and the training hospitals in the near future.

Conclusion & Recommendations

The pandemic was a systemic call to arms for organisations. Effective delivery of services is much needed, including response to COVID-19 pandemic. Various Government organisations have been strategising and planning, amidst the chaos about how to beat the pandemic, save lives, ensure social protection, and sustain economies. National task forces have been formed incorporating representatives of a cross-section of the public service, to plan and coordinate efforts to fight the spread and impact of the pandemic. In a whole of government and whole of society approach, they brought experts in public health, to ensure the effectiveness, coordination, coherence and integration of the strategies and plans aimed at stopping the spread of the virus, and managing the broader impacts of the pandemic.

These task-forces and the lessons learned from their work, will develop or enhance institutional mechanisms with capacities to deal more effectively with such crises in the future. If leveraged, these task-forces could provide a foundational building block, for enhancing government preparedness and crisis response.

In conclusion, it can be said that Indian Organisations including ICMR have been

consistently making a lot of efforts to address the challenges posed by the unprecedented pandemic; however, there was a significant scope for better practices. Some of these areas are:

- **Greater Involvement of Public Health Experts:**

    It appears that COVID-19 control has been driven primarily by politicians in power, and by bureaucrats. Scientific inputs on the health aspects mentioned above were either not sought, or ignored by policymakers. We cannot expect public-health experts to be in policy making, or regulatory roles for a national emergency. But during a pandemic, they should be included as essential members of decision-making committees, to analyse data and advise the government on disease-control measures.

- **Use of Disaster Management Framework**:

    Even though the Disaster Management Framework itself is inadequate, many of its provisions were not implemented optimally. The most important among them were those specifically related to disease surveillance guidelines, and provision of essential supplies and services to ensure successful social distancing. Adequate measures to ensure economic sustenance, such as employment generation and cash transfer schemes, should be incorporated in the Disaster Management Framework. The provision of essential supplies and services was

not ensured from the beginning and suffered from inadequacy later as well, which resulted in the massive exodus of migrant workers from cities, to their hometowns and villages. There is urgent need to have adequate guidelines and their optimal utilisation, so as to avoid such incidences in future.

- **Disease Surveillance**:

    The parameters of disease surveillance, and the key agency to coordinate it have remained mired in controversy and ambiguity throughout the crisis. IDSP may be strengthened with adequate resources, both financial and human, and may be given a statutory requirement for all states.

- **Role of Police and Other Forces**:

    For further strengthening the role of police and other forces, three things can be done. First, police training schools should include medical emergency and police responses in their syllabus. Second, with the police force stretched to the maximum, there is an acute need for private security guards to be trained and empowered. Last, communities, or clusters can be encouraged to organise themselves well.

- **Support Research and Innovative Technologies**:

    Pandemic focused research could give us a future head start in the battle against infectious diseases. Given the long history of this type of diseases in our country, we have accumulated years of experience and scientific knowledge, to prevent and

treat them. Institutes like the National Institute of Epidemiology in Chennai, the National Centre for Disease Control in New Delhi, the Centre for Infectious Disease Research in Bengaluru, and the National Institute of Virology in Pune, already exist. Government of India needs to invest significantly in strengthening the capabilities of these institutions, to give a a fresh impetus to research into infectious diseases.

• **Amplify Diagnostic Capacity:**
Diagnostic capacity for COVID-19 in the India, remains limited. The high turnaround period burdens the frontline hospitals that must isolate patients, for extended periods while awaiting results. Efforts are needed to scale up testing capacity, including

through accelerating investments in rapid point-of-care testing.

• **Preparing for a COVID-19 Vaccine:**
It is critical to plan for the development of a COVID-19 vaccine, to ensure sufficient manufacturing capacity, equitable distribution and affordability. A safe, effective vaccine for COVID-19 will be one of the most valuable tools to prevent COVID-19 transmission, and to allow individuals to safely resume normal activities.

The nature and life cycle of a pandemic is different from all other disasters and, thus, its response differs as well. A pandemic is far more unpredictable and long-lasting, than other disasters, requiring clear thinking and plans to control.

Photo Source: Bharat Bhushan_Hindustan Times via Getty Images

COVID-19 Testing: Indian Scenario

Background

In an earlier chapter titled 'COVID-19 Testing: Global Scenario', it has been discussed in detail how testing is crucial for containing the spread of the disease. In the current situation of COVID-19 pandemic, various countries such as South Korea have demonstrated the importance of testing, tracing and isolation in flattening the curve. The Government cannot gauge the scale and extent of the outbreak until and unless they don't have proper data on number of people who are infected with the disease. This data is very important to plan and strategize the measures required to combat the disease and protect the people who are still not exposed to the virus. The situation becomes more critical when a majority of infections are asymptomatic in nature but they still can infect other people. Testing helps not only in identification of people who are showing the COVID-19 symptoms but it also helps to identify and isolate the people who are not showing any symptoms but are still contagious. We have also seen from the experiences of countries like the USA and Italy that how timing of implementing widespread testing is important. If a country implements testing in the initial stage of the outbreak itself, they can halt the spread of the disease altogether. Though the USA started extensive testing of its citizens after three months of initiation of outbreak, but the infection had already spread to every nook and corner of the country and it is reflecting in the COVID-19 casualties of the country.

As the pandemic spread, India has emerged to be one of the top country which is hit hardly by COVID-19. By the month of September, India became the country with second highest number of COVID-19 cases[1]. How India has performed to manage the outbreak, especially in terms of testing is a crucial topic which needs to be discussed. This chapter gives an account of COVID-19 testing strategy of India and how this has evolved over time. Here, we will also discuss how the Indian States are performing on testing front.

COVID-19 Testing: How India Progressed so Far

In India, first case of COVID-19 was reported in last week of January 2020. From that time,

COVID-19 Testing Techniques in Use in India

Real Time-PCR: As per advisory of the World Health Organisation (WHO), in India, RT-PCR remains the frontline testing technique for detection of active COVID-19 cases. RT-PCR is the gold standard test and has the highest sensitivity and specificity amongst all the diagnostic techniques developed so far. This technique require advanced and expensive equipments and reagents which are available only in some of the sophisticated laboratories in the country. Currently, 914 labs across the country are using real time RT-PCR as the testing technique [2].

TrueNat and CBNAAT: To make up for the limited availability of the advanced technique of real time RT-PCR, Government of India (GOI) has authorized the use of TrueNat and CBNAAT systems for testing of COVID-19. The TrueNat and CBNAAT work on the same principle of nucleic acid amplification on which RT-PCR works. But these are comparatively more basic systems and are being in use for a long time at grassroots level for detection of TB and HIV. Currently, TrueNat and CBNAAT systems are being used in 747 and 125 labs, respectively.

Rapid Antigen Detection Test: On 14 June 2020, GOI has issued an advisory and recommended the use of antigen detection kit developed by a South Korean company, SD Biosensor for detection of active COVID-19 cases in the country. The test kit is a chromatographic immunoassay and designed for point-of-care detection of COVID-19. The validation tests concluded that the kit has high specificity but moderate sensitivity. Therefore, the Government has strictly advised to confirm the negative results of kit with a follow up test through RT-PCR. Though, in September 2020, ICMR in its advisory stated that retesting is required only in the negative samples from symptomatic individual. Eventually, apart from South Korean kit, ICMR has also approved two other kits from Indian and Belgian companies.

Serological testing: Serological assays are helpful in surveillance purposes and help the policy makers to understand the extent of spread of disease and eventually design the control measures. GOI has advised the states to carry out sero-surveys on a large scale with the help of ICMR and USFDA approved IgG based ELISA and CLIA kits. The ICMR has also clearly instructed that the serological assays should only be used for surveillance purposes and not for detection of active cases.

the strategy of COVID-19 testing in India has kept on evolving over time. By the third week of March 2020, ICMR's strategy was to test only the symptomatic people with contact or travel history. Even though India was witnessing the positive outcomes of mass testing from countries like South Korea, ICMR was not in favour of expanding testing at a mass scale due to some practical reasons such as: larger population of the country, avoiding futile testing and hospitalization of asymptomatic patients, avoiding complexities involved in extensive contact tracing etc. Also, government had already imposed complete lockdown and was able to contact trace the source of infection of almost all the COVID-19 positive patients at that time. Moreover Ministry of Health felt that testing at a large scale may create panic among the general public. Whatsoever be the reason,

the critics believed that the government could not expand testing even if they wish to because of lack of required preparedness and limited testing facilities. On 20 March 2020, the ICMR has included hospitalized patients with Severe Acute Respiratory Illness and asymptomatic direct and high-risk contacts of confirmed cases in inclusion criteria for testing. By 18 May 2020, keeping in view the huge migration within the country, ICMR has included the symptomatic ILI migrants in the testing criteria. Initially, apart from direct and high risk contacts of positive persons, the testing strategy of India focused primarily only on the symptomatic persons which has eventually expanded to testing on demand. The various stages of India's COVID-16 strategy are compiled below:

Table 1: Evolution of Strategy for COVID-19 Testing in India (Source: ICMR)[3]	
Timeline	**COVID-19 Testing Inclusion Criteria**
17 March 2020	• All symptomatic people who have undertaken International travel • All symptomatic contacts of laboratory confirmed positive cases • All symptomatic health care workers managing distress/SARI
20 March 2020	• All symptomatic people who have undertaken International travel • All symptomatic contacts of laboratory confirmed positive cases • All symptomatic health care workers • All hospitalized patients with Severe Acute Respiratory Illness • Asymptomatic direct and high-risk contacts of a confirmed case
09 April 2020	• All symptomatic people who have undertaken International travel • All symptomatic contacts of laboratory confirmed positive cases • All symptomatic health care workers • All hospitalized patients with Severe Acute Respiratory Illness • Asymptomatic direct and high-risk contacts of a confirmed case • All symptomatic ILI patients in hotspots/cluster and in large migration gatherings/ evacuees centres

18 May 2020	• All symptomatic people who have undertaken International travel • All symptomatic contacts of laboratory confirmed positive cases • All symptomatic health care workers • All hospitalized patients with Severe Acute Respiratory Illness/ ILI • Asymptomatic direct and high-risk contacts of a confirmed case • All symptomatic ILI patients in hotspots • All symptomatic ILI among returnees and migrants within 7 days of illness.
14 June 2020	Along with all the categories mentioned on 18 May 2020, GOI has included some of new categories to be tested with the help of Rapid Antigen Detection Kits. They are: • All symptomatic ILI patients presenting in a healthcare setting and are suspected of having COVID19 infection. • Asymptomatic patients (hospitalized or seeking hospitalization) who are undergoing chemotherapy, immunosuppressed, HIV+, diagnosed with malignant disease, transplant patients, elderly with comorbidities. • Asymptomatic patients undergoing aerosol generating surgical / non-surgical interventions.
04 September 2020	• ICMR issued an advisory on COVID-19 testing strategy where they have mentioned all the previously discussed categories and choice of tests to be undertaken in different settings of containment zones, non-containment areas and hospital settings. • Apart from these, ICMR has also advised the states to allow on- demand testing for the individuals who want themselves to get tested. • In this advisory, ICMR emphasized on retesting in the case of negative results from symptomatic person. If an asymptomatic person gets negative result with RAT, then there is no need of retesting until s/he turns symptomatic.

During the initial course of pandemic, one of the reason to limit the criteria of people for testing was limited availability of resources, test kits and laboratories in the country. When the disease entered the country in the end of January 2020, India had only one lab (National institute of Virology (NIV), Pune) for testing of COVID-19. But the Government kept on increasing the number of COVID-19 testing laboratories and by June 2020, there were around 1,000 labs (730 Government and 270

private) operating in country for COVID-19 testing. By September 2020, this numbers swells to 1,786 labs[2]. Also, Initially, India was totally dependent on foreign companies for the RT-PCR testing kits [4]. Limited availability of testing kits was also a limiting factor to increase the number of tests in the population. But after the government urged the domestic companies to produce the testing kits, the indigenous production of kits was significantly increased and by the second fortnight of May

2020, 75 per cent of testing kits, India was using were procured from domestic companies[5]. This developments in infrastructure and reagents has resulted in substantial increase in the number of tests being conducted per day and by 21 August 2020 India crossed the target of more than 1 million tests per day[6].

Though this tremendous increase in testing numbers seems remarkable but there is a bleak side to it. The most of the tests which are currently being done are not the gold standard RT-PCR but less sensitive, RATs. When ICMR issued the advisory on the use of RATs on 14 June 2020, it has clearly stated that due to high chances of getting false negatives with this method, all the negative samples should be retested with RT-PCR test to confirm their results. But it seems like this was never followed by the states who are using RATs for screening of COVID-19. Delhi was among the first Indian states to introduce the RATs for mass COVID-19 testing on 18 June 2020. Since then, the testing rate in Delhi has touched many milestones. According to the Delhi government, by mid-

September 2020, Delhi was conducting highest number of tests in the world with a rate of 3,057 tests per million population. But one question which needs to be asked is, out of these, how many tests were RT-PCR and how many were RATs? Also, what is the rate of retesting of RAT negative tests? If we refer to the daily health bulletin of Delhi government, we can easily figure out that increase is number of RATs is the major contributor in dramatic increase in testing rates of Delhi. By the mid of September 2020, the proportion of RATs in total daily tests was as high as 86 per cent and only 14 per cent tests were done by RT-PCR[8]. Also, according to reports, the rate of retesting of RAT negative samples in Delhi is less than 1 per cent which is alarmingly low[9]. One more observation from the testing data of Delhi is under-utilization of RT-PCR capacity and significant reduction in RT-PCR tests. Delhi is not the only state which is now almost totally depending on RATs for COVID-19 screening. Karnataka, Andhra Pradesh, Odisha and Telangana have also ramped up rapid antigen testing at significant rate[10]. Though majority of

Figure 1: COVID-19 Testing Rates of Most Affected Countries
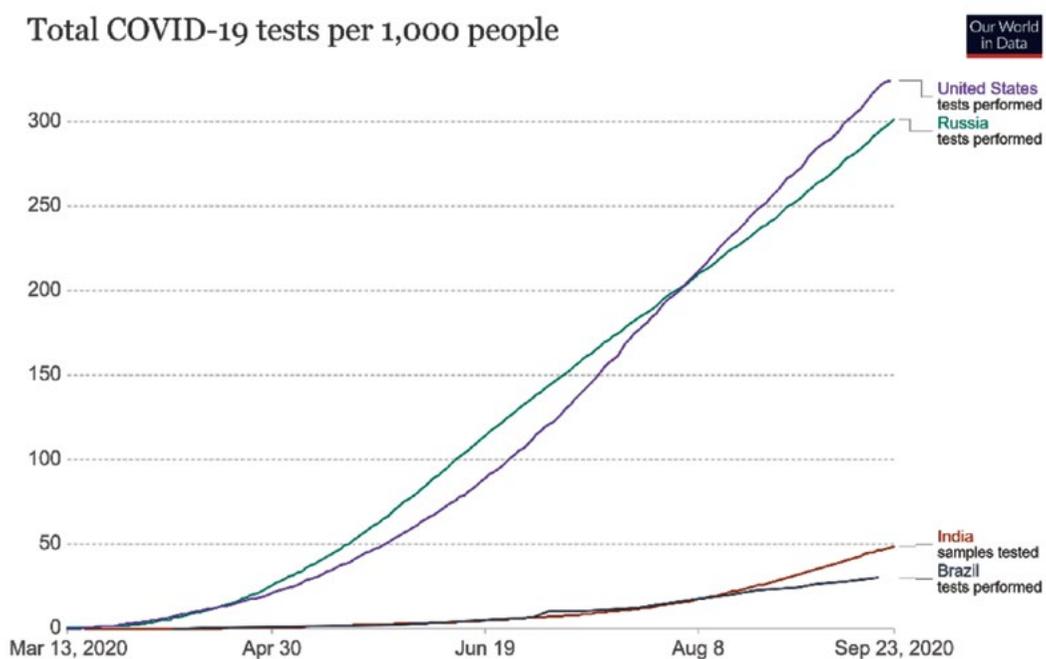
Source: Our World in Data, as on 23 September 2020

the States do not share data on proportion of RT-PCR and RATs, but it can be believed that over-reliance on RATs is now the common practice in Indian states. Experts believe that this is not a very promising strategy because this may be beneficial in increasing the testing rates but will lead to a miss of almost half of COVID-19 positive cases.

Thanks to RATs, all States in the country are now performing more than 140 tests per day per million population which is in line with the advisory of the WHO. But if we compare the testing rates of top four affected countries, we are just above Brazil and way below the testing rates of the USA and Russia (Figure 1)[11].

Apart from the tests to detect acute COVID-19 infection, the ICMR on 30 May 2020 advised the States to conduct sero-surveys by using the indigenously developed IgG ELISA kit. These sero-surveys are helpful in gauging the spread of the disease and guides the policy makers to design the appropriate public

health interventions. The ICMR also gave the details of groups/community whom the States can engage as participants of the survey. The list includes Immuno-compromised patients, individual in containment zones, health care workers, security personnel and migrants among others [12].

COVID-19 Testing- India versus Other Countries

By September 2020, India has been doing one million tests per day [6]. But the fact is that the country took more than six months to cover its just one percent population by testing. If we consider the figures from late September (23 September 2020), this translates into 48 tests per 1,000 population. When we compare this with the other worst affected countries such as USA (324) and Russia (299), this number seems very small (Figure 1). Although, it has to be noted that the testing rate was merely 05 tests per 1,000 population in the month of June 2020. It is very difficult to ascertain the spread

Figure 2: Positivity Rate of COVID-19 Tests in Most Affected Countries- India, the US and Russia (Brazil's data not available)
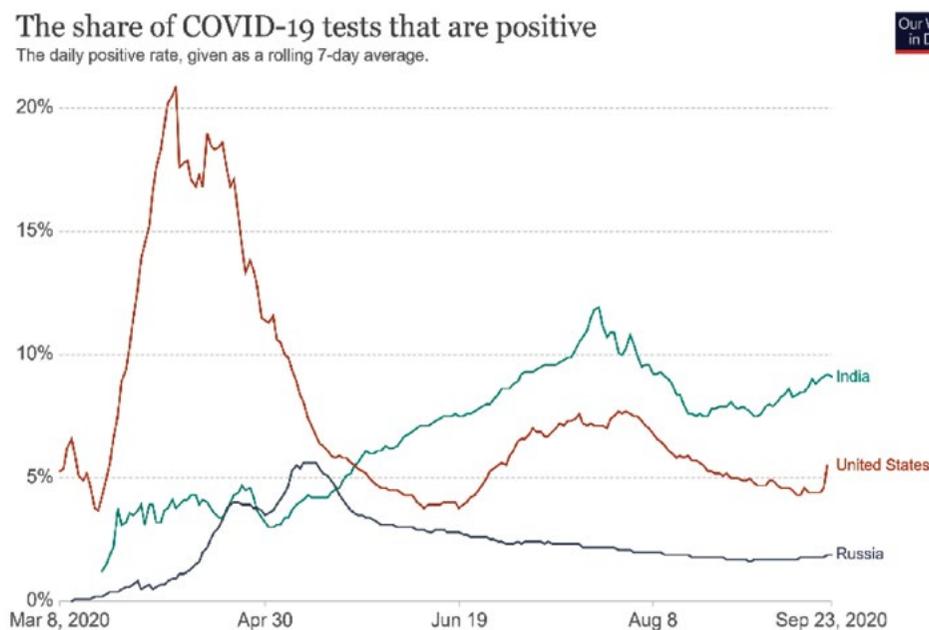
Source: Our World in Data, as on 23 September 2020

of disease by testing such a small proportion of people in such a big country.

The other important indicator which needs to be focused is positivity rate. As on 23 September 2020, the proportion of daily COVID-19 tests turning out to be positive in India is around nine percent, which is significantly higher than USA and Russia (Figure 2) [14]. In May 2020, WHO has advised the countries to not to reopen the countries until the positivity rate remains below 05 per cent for 02 weeks. For India, the daily positivity rate was below 05 per cent till 20 May 2020. But after that, as India relaxed the lockdown restrictions, the daily positivity rate has seen a constant surge [15]. As far as testing is concerned, the experts believe that a high positivity rate is an indication of insufficient testing which is failing to keep up with the pace of increase of outbreak. The constant increase in the positivity rate of India also suggests the necessity to increase efforts on testing front.

The Status of Testing in Indian States

India is a vast country with 28 States and 8 Union Territories. Taking into account such geographical and demographic diversity, each State of the country can be considered equivalent to a country. Each State of the country has different load of COVID-19 disease and so is their strategy to combat it.

In India, by the month of September 2020, Maharashtra remains the leading state both in number of COVID-19 cases (1,384,446) and deaths (36,662). After that comes Andhra Pradesh and Tamil Nadu with 693,848 and 597,602 cases, respectively. As far as rate of testing is concerned, the small Union Territories (UTs) are doing fairly well. Dadra & Nagar Haveli (including Daman & Diu), Ladakh, Goa, Andaman & Nicobar Islands and Jammu

& Kashmir remained among the top 10 states/ UTs with highest tests per million population. Out of the most affected States, Delhi is doing exceptionally well on testing front. The count of per million tests for Delhi stands at 138,614 whereas the most affected State, Maharashtra is doing merely 48,967 tests per million [13]. The rate of testing in other high burden States, Andhra Pradesh and Tamil Nadu is 97,849 and 84,253 tests per million, respectively. Table 2 depicts the status of testing in Indian States after 3 months of issuance of testing advisory by ICMR and testing rates as of September 2020.

When we compare the testing rates of the States between June and September 2020, it can be inferred that States of Bihar, Uttar Pradesh, Madhya Pradesh, West Bengal, Chhattisgarh, and Jharkhand continue to remain in bottom ten in comparison with other States. Some States such as Rajasthan and Himachal Pradesh, who were doing testing at a good rate in June 2020 have slipped to bottom five in September 2020 (Table 2).

From Table 2, it is evident that Union Territories are doing well on tests per million people. With 138,614 tests per million, National capital of Delhi stands at third position in the country and stands at number 6 as far as number of COVID-19 cases are concerned. One can say that the worst is over for Delhi as the daily positivity rate has reduced to almost 7 per cent in September 2020 which was as high as 37 per cent in the month of June 2020 [12]. But one must not forget that Delhi is now doing as high as 86 per cent RATs for COVID-19 screening. This means that the actual positivity rate would be much higher than 07 per cent.

Similar is the case with Maharashtra, which consistently remains the state with highest number of cases and deaths. Maharashtra is testing only 48,967 persons per million

Table 2: Status of Testing in Indian States. Trends Showing How Testing Has Increased Between June 2020 to September 2020

Testing Status Till June 2020 (3 months after the First ICMR Advisory on Testing) (Data as on 23 June 2020)		Testing Status Till September 2020 (Latest Data) (Data as on 23 September 2020)	
States/UTs	Tests per million	States/UTs	Tests per million
Ladakh	43306	Ladakh	161310
D&N Haveli and Daman & Diu	42587	Goa	158312
Goa	34693	Delhi	138614
Andaman and Nicobar Islands	31695	Arunachal Pradesh	134236
Jammu and Kashmir	22883	Andaman and Nicobar Islands	126436
Delhi	19769	Puducherry	114852
Sikkim	14300	Jammu and Kashmir	106840
Tripura	13919	Andhra Pradesh	97849
Andhra Pradesh	12799	D&N Haveli and Daman & Diu	96446
Tamil Nadu	11516	Tripura	91120
Arunachal Pradesh	11503	Tamil Nadu	84253
Manipur	10907	Assam	83832
Puducherry	9659	Kerala	72797
Rajasthan	8827	Sikkim	72480
Himachal Pradesh	8563	Telangana	67545
Assam	8367	Karnataka	64631
Punjab	7940	Odisha	62298
Haryana	7652	Manipur	62070
Karnataka	7588	Haryana	60348
Mizoram	7275	Chandigarh	60337
Maharashtra	6327	Gujarat	57581
Chandigarh	5961	Uttarakhand	54010
Nagaland	5421	Punjab	53238
Kerala	5317	Mizoram	52009
Odisha	4885	Bihar	51123
Uttarakhand	4797	Jharkhand	50381
Meghalaya	4770	Maharashtra	48967
Gujarat	4757	Meghalaya	40085
West Bengal	4127	Nagaland	38579
Chhattisgarh	4091	Uttar Pradesh	37036
Madhya Pradesh	3412	Rajasthan	36517
Jharkhand	3273	Himachal Pradesh	35967
Uttar Pradesh	2236	Chhattisgarh	30993
Telangana	1466	West Bengal	29378
Bihar	1339	Madhya Pradesh	21246

Source: Our World in Data, as on 23 September 2020

population. Though this testing rate is comparatively higher than what the State was doing earlier (in June testing rate was 6,371) but it remains inadequate when we see the magnitude of outbreak Maharashtra is facing. The daily positivity rate of Maharashtra has touched alarming level of 20 per cent in September 2020 which means that more than one test is coming positive per five tests[15]. Experts are suggesting to increase the testing rate to keep up with the pace of outbreak Maharashtra is facing although they are not considering this as isolated factor to gauge the infection. The cumulative positivity rate of Andhra Pradesh and Tamil Nadu is 12 per cent and 8 per cent respectively. But they still have to certainly increase the testing rates to bring their positivity rate below recommended value of 5 per cent.

In the first six months of pandemic, the States of Bihar, Telangana, Uttar Pradesh, Madhya Pradesh and Jharkhand have performed rather poorly on the testing front (Table 2). But Uttar Pradesh and Bihar have picked up very well after that. Even though this is a great attempt by these states to boost their testing, but the timing of accelerating testing is incongruous. These two states have witnessed largest in-surge of migrants from different parts of the country in the month of April, May and June 2020. At that time, there was the need to test a larger proportion of people as there were chances of inflow of COVID-19 positive people among the migrants. But lack of extensive testing and subsequent isolation of infection individuals led to the eruption of outbreaks in these states, especially in rural areas.

Kerala Model of Testing

One Indian state which requires special mention for effectively applying testing to control the spread of COVID-19 disease, at least in the initial phase of pandemic, is Kerala. Although, in the later period, Kerala's numbers on test per million people are not that exceptional but with their aggressive testing strategy in the beginning of the outbreak itself, Kerala was able to considerably control the spread of the outbreak. Kerala is the first State of India to report COVID-19 case in the end of January 2020 and at a time had the largest number of COVID-19 cases in the country. The State administration very diligently worked on test, trace and isolate formula and successfully contained the spread of the disease. The Government has set up COVID-19 testing sites and kiosks not just at State level but also district and block level. All the travellers arriving in the State were being screened and tested for COVID-19. In the first half of April 2020, when most of the States were struggling with testing, Kerala even though being a small State, conducted the highest number of tests in the country. Along with testing, the rigorous tracing mechanism by assigning a dedicated tracing team and involving PRI members and volunteers worked in favour of Kerala. The teams used advanced techniques such as GPS tracing along with door to door tracing to identify the contacts of COVID-19 positive person. Nevertheless, a very strong public health care system and past learnings from Nipah outbreak also helped the State in managing the COVID-19 disease. All these efforts helped Kerala in flattening the curve and result of all this is that on the first day of May 2020, there was not a single new case of COVID-19 reported in the State. Kerala is a model that demonstrated the importance of timing and how early implementation of testing prevents the spread of disease.

The testing trends also demonstrate the unfortunate incidences of lessening the testing by some States even when the number of positives per hundred tests was keeping on increasing. When the positivity rates were increasing and there was the need of increasing the testing numbers, Delhi, Maharashtra, Gujarat, Madhya Pradesh and Odisha have reduced the number of tests especially during the last week of May and first week of June 2020 [16]. Similar instances of reduction in testing was observed again in Delhi in the month of August 2020. As there were no reports of exceptional shortage of kits, some experts believe that this reduction in tests might be done to downplay the increasing number of COVID-19 cases coming from those States.

Delay in testing results was also one of the shortcomings which has compromised the actual goal of testing. There are several reports from Karnataka, Rajasthan, Madhya Pradesh, Delhi, Andhra Pradesh, Meghalaya, Goa and many other States which show that people are not getting their test reports even after a week of getting tested. This delay in testing hampered administration's efforts of controlling the spread of the virus because people do not stay indoors as long as their test results don't come out [17].

India's Response to Overcome the Bottlenecks in Boosting Testing

There were several issues in the initial phase of the pandemic which were slowing down the nation in boosting its testing capacity. But India has done a good job in addressing some of the issues such as:

Making the testing criteria more liberal: India had a very stringent testing criteria which restricted the testing of asymptomatic individuals. Several experts believed that even though the model of mass testing which South Korea and Russia have employed can't be replicated in India owing to its huge population but anyone who wants to get tested for COVID-19 should be able to do that. As ICMR

Dharavi Model of Testing

Located in Mumbai, Dharavi is the Asia's largest slum is spread around 2.5 Sq. Km area. The first COVID-19 associated casualty was reported in Dharavi on 1 April 2020. After that, Dharavi became a national hotspot very soon. Many thought that this outbreak would prove to be disastrous for the slum, owing to the very high population density and congested settings. But with the proactive efforts of the Municipal Corporation and local administration, within two months the Dharavi has managed to flatten the COVID-19 curve. Proactive screening and testing has played a crucial role in containing the spread of the virus. According to Kiran Dighavkar, Assistant Commissioner, Brihanmumbai Municipal Corporation, "Proactive screening helped in early detection, timely treatment and recovery". Following aggressive screening strategy, around 07 lakh people were screened in Dharavi and 14,000 tests were done. Timely screening and testing of individuals has helped to isolate the infected individuals from others and this has checked the infection to a great extent. Such was the impact that WHO whole heartedly praised the Dharavi model for controlling the COVID-19 outbreak.

has stated in its study that approximately 70 per cent COVID-19 infection are asymptomatic[18], without testing asymptomatic patients we were totally ignoring those 70 per cent infections. But eventually, the Government has relaxed the testing criteria and allowed the on-demand testing of individuals.

Allowing the states to formulate their own testing strategy: In India, health is a State subject but during the COVID-19 outbreak, ICMR is the central agency for designing the national wide testing stategy. The States have to follow the guidenes issued by ICMR on various aspects of testing. This sometimes resulted in disaggrements between the centre and states. For instance, in June 2020, Delhi Government openely criticized the strategy of Centre and termed it is a roadblock in increasing COVID-19 tests[19]. But eventually, the States were given more powers to design testing strategy on the basis of their local experiences.

Strengthening the testing facilities and production, supply chain, storage faciities of test kits: The Government has done a tremendous work in increasing its testing capacity from a single lab in January 2020 to more than 1,750 labs in September 2020. Instead of relying solely on expensive and sophispticated RT-PCR facilities for COVID-19 testing, the Government employed CBNAAT and TrueNat platforms in COVID-19 testing which made the testing of COVID-19 possible at grassroots level. On 14 June 2020, ICMR introduced rapid antigen tests to supplement the already available molecular tets. This turned to be a turning point and allowed point-of-care testing at mass level. To tackle the increasing demand of the test kits, the Government boosted up the production of kits and is also approving new test kits regularly.

What Still Needs to be Done?

Restrained use of rapid antigen tests and more focus on molecular tests: As discussed above, slowly Indian States are relying more and more on RATs for COVID-19 screening. But the administration should consider that the RATs are not as efficient as molecular methods of detection. If screening is done exclusivey by RATs, then a large chunk of infected individuals will come out as false negatives. Such individuals will keep on spreading the infection which will be a setback for COVID-19 control strategies. The States need to religiously stick to the guidelines of ICMR on the use of RATs and follow proper protocol. Otherwise, excessive use of RATs and ignoring RT-PCR (or other molecular tests) will surely help in increasing the testing rate but will never give the correct picture of the extent of infection in the community.

Better tracing strategy: Testing is just one component of trio 'Testing, Tracing and Isolation' to manage the spread of the outbreak. If we are emphasizing on the ramping of testing, then simultaneously contact tracing should be strengthen. In a recent study published by ICMR, of the total people tested for COVID-19 during the period of 22 January - 30 April 2020, more than 44 per cent of positive cases were not traced back to any category of the potential source to infection[20]. It is not difficult to assume that if such is the condition in beginning of the outbreak, then things are going to become more difficult with increasing spread of infection. To improve the contact tracing, India should also employ high tech methods such as GPS tracing, CCTV footages etc. to trace the persons who might have come in contact with the postive person. The Indian State of Kerala has successfully demonstrated the use of these methods in contact tracing and containment of COVID-19 disease.

Conclusion

Over the course of pandemic, the World Health Organization has been continuously pressing on the importance of testing in combating the COVID-19 disease. There is no doubt that India has come a long way from less than 100 tests per day in February 2020 to around 1,000,000 tests per day by September 2020. The country has increased its testing capacity by establishing testing facilities and also indigenous production of testing kits and reagents. India has almost 2,000 labs equipped with testing facilities. One may be overwhelmed by the fact that among all the countries of the world, India is currently doing most number of tests in a single day. But this achievement seems trivial when we consider the population of India which is close to 135 crores. Moreover, with the relaxations in restrictions, opening of public places and transportation as well as the approaching festive season, the role of testing increases manifold. Obviously, there is a strong necessity to expand the testing capacity to cover the population and effectively control the spread of the disease post lockdown. Along with this, the Government should also focus on encouraging more and more people to get themselves tested in case of appearance of symptoms or contact with a positive person. As evident from many reports, the Governments are relying excessively on the RATs for COVID-19 testing and underutilizing the RT-PCR facilities. The Government should listen to experts and create a balance between the gold standard RT-PCR tests and RATs. Then only we will be able to identify the actual number of COVID-19 cases. Contact tracing is another crucial area which needs to be strengthened across the States of the country. In a nutshell, it can be said that India has done a lot on testing front but there is still a lot which needs to be done, if we wish to come out of this deadly pandemic with as minimal loss as possible.

Potential Role of Ayurveda in COVID-19 Management

Introduction

Ayurveda, which originated in India; is the oldest documented health care system. Ayurveda is made of up two syllables – *Ayu* meaning life and *Veda* meaning knowledge. Hence, Ayurveda is a system of healthcare which concentrates on maintaining the health of a healthy person first, and then treats the imbalances of a sick person. Ayurveda mentions what is good and what is not good for health as well as what causes happiness and sadness in an individual. It also, importantly, indicates measures for self-evaluation of health status.[1]

According to Ayurveda, a perfect balance between three factors are responsible for health and imbalance, or ill health. They are *Vata*, responsible for all kinds of movements in

the body like respiration, movement of joints and movement of bowels; *Pitta*, responsible for all metabolic/digestion, absorption/ assimilation of nutrients and excretion of waste and toxic materials out of the human body; and *Kapha*, responsible for maintaining joints and providing lubrication to all joints. Any over, under or irregular activity of either one of these factors, leads to ill health. This imbalance happens due to our faulty food habits, activities, seasonal variations, improper application of sense organs and thought process.[2]

As per science, the manifestation of any disease in an individual, including pandemic manifestation; is dependent on his physiology; as it is noticed that not all Coronavirus infected individuals succumb

to pneumonia, or respiratory failure. Thus, there are definite personalised factors that determine the fate of any illness. Host immune responses are very much distinctive and thus personalised therapeutic measures are decisive to sustain in a highly contagious outbreak such as COVID-19.[3] Immune homeostasis is distinctive or individualistic. Factors such as genes, gender, nutrient status, age, gut flora, dietary habits, physical activity, alcoholism and other substance abuse, pregnancy etc. highly determine the cross sectional immune status of individuals. Hence personalised medicine is the key for achieving better host homeostasis in pan-immune system ailments afflicting humans, infectious or otherwise. [4]

Role of Ayurveda in Past Epidemics Management

Reference of epidemics and its management is available in traditional health systems. "Janapadodhwamsa Vyadhi" is a well-defined term for epidemics in the Ayurvedic texts.[5] The word 'Janapadodhwamsa' comprises of two words *Janapada* (large population) and *Udhvamsa* (destruction); which means the diseases affecting and causing damage of a large number of people. Factors which are familiar to the people under a particular community like air (*Vayu*), water (*Jala*), habitat (*Desha*) and seasons (*Kala*), sinful acts (*Adharma*) in the form of war, affliction by attacks of monsters, demon, alliants (*Rakshas*) etc., and curses (*Abhishap*) are responsible for 'Janapadodhwamsa.[6]

Practitioners of traditional medicines (including Unani, Siddha, and Ayurveda) have significantly contributed to the management of epidemic outbreaks in the past. During the cholera outbreak in 1903, P. S Varier who

is founder of Kottakkal Ayurveda Sala, visited patients and studied their symptoms carefully, developed medicines for the same in his unit, and distributed them in the community.[7] Herbal remedies and Ayurveda have been used in Sri Lanka for the management of malaria, and we are aware that the Traditional Chinese Medicine remedy for malaria gave rise to the modern drug Artemisinin.[8]

In the past 6 –7 years, the AYUSH sector has contributed to the management of dengue as well as chikungunya in the states of Kerala and Tamil Nadu. The herbal decoction "Nilavembu Kudineer" was distributed on a large scale during the dengue outbreak in Tamil Nadu, by state agencies and social organisations.[9]

COVID-19 has provided another opportunity for the creation of AYUSH regimens for the management of an epidemic.

Understanding Coronavirus With Ayurveda Principles

Ayurveda, has a holistic approach of considering mind-body-physiology to deal with disease conditions. The COVID-19 pathology is novel and can be understood in at least four classical Ayurveda concepts. [10]

1. Considering the fever as a symptom, due to the invasion of an invisible virus; this can be compared with the concept of fevers due to exogenous factors, as explained by Acharya Charaka.

2. Compromised immunity, leading to pulmonary pathology is another domain.

3. The descriptions of contagious diseases is the third domain. Transmission modes of such diseases, including physical

contacts has been well explained. Skin to skin contact, air pollution by exhaled air, sharing food with infected person, wearing and sharing of infected clothing, bedding etc., are enlisted under such physical contacts.

4. The fourth domain is behavioural code of conduct and life style guidelines, explained through daily and seasonal regimen in the classical texts. Religiously adhering to such codes of conduct will help in maintaining health in a positive way. One such behavioural code that is advised is to sneeze, laugh or yawn covering the face. Classics also issue specific guidelines to abandon the infected places, performance of holy rituals like herbal fumigation, chanting of Mantras and strict observance of good behaviour and moral conduct in preventing the spread of disease. These codes have an influential role in prevention of current pandemic, and are on a level with the advisories of healthcare authorities that focused on hand hygiene, respiratory hygiene and isolation etc. Further, experiments have demonstrated that herbal fumigation reduces number of bacteria, suggesting that the traditional Ayurvedic fumigation with natural plant products is effective in reducing air-borne bacteria, and in disinfecting inanimate surfaces.

The purpose of behavioural code of conduct is to avoid all types of contamination, clean and disinfect the environment, streamline the disturbed lifestyle, and attain mental peace. Such activities are believed to have significant role in preventing the spread of communicable diseases.

In other words, it can be inferred that, Advocacies from healthcare authorities have accepted and emphasised these principles in preventing infection.

Behavioural Code of Conduct

- The code of conduct helps in preventing the entry of virus into the body.

- Drugs addressing the fever, possibly help in preventing the replication of the virus in the body.

- Drugs addressing compromised immunity, will protect organ damage (through their immune modulating effects).

Role of AYUSH System in Addressing COVID-19 Pandemic

Till date, there are no specific vaccines or medicines for COVID-19. Treatments are under investigation, and they will be tested through clinical trials. The best ways of preventing infection are breaking the chain, enhancing an individual's body immunity, identifying the infection early and timely medical care.

The AYUSH Ministry on its part had released a public advisory on preventive practices based on the AYUSH systems' knowledge on 29 January 2020 itself; the day the first case was detected in India.

"The traditional healthcare system of the country provides lifestyle advocacies to boost immunity, which helps the prevention of various kinds of infectious diseases. The Ministry of AYUSH is issuing the advisory as a preventive measure, and not claiming to be a treatment advice for the Coronavirus infection."[11]

The advisory included preventive medicines of the various systems under AYUSH. However, this was met with criticism and disparaging remarks amounting to ridicule, reportedly by public health experts, who called them placebo or myths. On 6 March 2020 the Ministry sent a second advisory with an annexure of 33 published research studies, providing evidence of their rationale covering the various systems to Chief Secretaries of all States and Union territories.[12] The Central government asked AYUSH ministry for scientific and evidence-based solutions from the AYUSH systems, to tackle challenges of COVID-19, and this would also curb false claims in the name of AYUSH.[13]

On 1 April 2020 the Ministry set up an online channel for receiving suggestions based on scientific AYUSH explanations, therapies, and procedures that could restrain the spread of COVID-19, or to manage the disease. An Interdisciplinary AYUSH Research and Development Task Force for COVID-19 was constituted on 2 April 2020. The mandate of the Task Force included "identification of potential preventive therapies and therapeutic approaches from AYUSH systems for different stages of treatment of COVID-19 as standalone and/or add-on interventions to conventional care", and to collaborate with other research bodies such as the Indian Council of Medical Research, Council of Scientific and Industrial Research, AIIMS, Defence Research and Development Organisation, Department of Biotechnology, Department of Science and Technology, AYUSH industry, Pharmaceutical Industry, information technology industry, and State Governments; after vetting by a mechanism to coordinate among science agencies, scientists, and regulatory bodies. Bringing Ayurveda protocol for the management of COVID-19 is a leap towards progress, in traditional system of medicines.

A Notification was published in the Extraordinary Gazette of India on 21 April 2020 providing the approval and mandatory compliances for any AYUSH research in humans for COVID-19. This facilitated operationalisation of research, development, and intervention efforts. Based on the consultation with CDSCO, the Ministry of AYUSH with the approval of the Minister of State Independent Charge notifies that scientists, researchers, clinicians of any recognised systems of medicine under IMCC Act, 1970, HCC Act 1973 and NMC Act 2019 can undertake research on COVID-19 through Ayurveda, Siddha, Unani and Homeopathy systems, including prophylactic measures, interventions during the quarantine, symptomatic and asymptomatic cases of COVID-19, public health research, lab based research, etc., to generate evidence.[14]

Also, Ministry of AYUSH, All India Institute of Ayurveda (AIIA) and National Consultation prepared Guidelines for Registered Ayurveda Practitioners in the wake of COVID-19 pandemic. This formed a firm foundation for the use of registered professionals. These guidelines considered quarantine, infected and co-morbid individuals, besides providing measures for restorative healthcare. After getting a nod from the Ethics Committee, and registration in CTRI, AIIA has initiated population-based observational study in the large scale cohort of 80,000 Delhi Police to generate evidences against Ayurveda interventions in improving immunity through a preventive AYURAKSHA kit, holding a few formulations of scientific rigour. This is expected to improve the immunity of the individuals and decrease the incidences of infection. A mobile application, Ayush Sanjivani was also launched for understanding the measures adopted by public, for enhancing immunity and keeping themselves healthy in the difficult COVID-19 situation.[15]

Protocol Guidelines for the Management of Mild COVID-19 Infection

General and Physical Measures

Follow physical distancing, respiratory and hand hygiene, wear mask.

Nasal instillation/application of medicated oil (*Anu Taila* or *Shadbindu Taila*) or plain oil (Sesame or Coconut) or nasal application of cow's ghee (*Goghrita*) once or twice in a day, especially before going out and after coming back to home.

Gargle with warm water added with a pinch of turmeric and salt. Water boiled with *Triphala* (dried fruits of Emblica officinalis, Terminalia chebula, Terminalia bellerica) or *Yashtimadhu* (Glycyrrhiza glabra) also can be used for gargling.

Steam inhalation with *Ajwain* (Trachyspermum ammi) or *Pudina* (Mentha spicata) or Eucalyptus oil once a day.

Moderate physical exercises.

Adequate sleep of 6 to 8 hours.

Follow yoga protocol for primary prevention of COVID-19

Dietary Measures

Use warm water or boiled with herbs like ginger (Zingiber officinale) or coriander (Coriandrum sativum) or basil (Ocimum sanctum / Ocimum basiicum), or cumin (Cuminum cyminum) seeds etc., for drinking purpose.

Drink Golden Milk [Half tea spoon *Haldi* (Curcuma longa) powder in 150 ml hot milk] once at night. Avoid in case of indigestion.

Fresh, warm, balanced diet.

Drink Ayush *Kadha* or *Kwath* (hot infusion or decoction) once a day.

Recently, a consensus document was developed by expert committees from All India Institute of Ayurveda (AMA), Delhi, Institute of Post Graduate Training and Research in Ayurved (IPGTRA), Jamnagar, and National Institute of Ayurveda (NIA), Jaipur Central Council for Research in Ayurveda (CCRAS), Central Council for Research in Yoga and Naturopathy (CCRYN), other national research organisations. Some of the important protocol guidelines are given for management of mild COVID-19.[16]

Way forward

The treatment of epidemic aims at both preventive and curative measures. Preventive measures help to minimise the occurrence of emerging disease and limit the hazardous effects of causative factors, while corrective actions help to treat the condition properly. For the management of epidemics, specific preventive measures as described in Ayurveda are as follows:

1. Collection of potent medicinal drugs before the outbreak of an epidemic.
2. Avoid sinful acts and intellectual errors.
3. Rejuvenation therapy to enhance the immunity and strength of the body.
4. Truthfulness, compassion for living being, charity, generosity, worshipping god, tranquillity, codes of conduct, protection of the self by mantras and auspicious rituals, help to prevent the disease.
5. Search for the things which are suitable for the person, residence in auspicious localities, discussion of religious scriptures.
6. Avoid pollution of air, water, food or environment.[17]

AYUSH Ministry and clinical practitioners accepted the potential of herbs such as *Ashwagandha* (Withania somnifera), *Guduchi* (Tinospora cordifolia), *Kalamegha* (Andrographis paniculata), *Tulsi* (Ocimum tenuiflorum), and *Haridra* (Curcuma longa) and these can be proven to be useful in such maladies. Screening is being carried out to verify potentiality of herbal medicines to directly inhibit novel Coronavirus. Ayurvedic herbal interventions hold potential to be used in place, or along with the conventional drugs that is attracting global community for its significant role in health-care system.

Ayurveda comes handy in terms of strengthening immunity of the body so that number of exposed population could remain asymptomatic, or experience only mild disease, and fewer proportions move to become severe cases. If people face severe infection, the Ayurvedic therapeutics can also be more specific depending on how the pathophysiology of severe cases leading to sudden decline and death is conceptualised.

In the management of COVID-19, the two approaches of suppression and mitigation, "flattening the curve" and "allowing herd immunity to develop," can either be viewed as oppositional, or as complementary to be built into a holistic and dynamic response. Similarly, the epistemologically diverse approaches of traditional systems and modern biomedicine can be either viewed as one being "rational" and the other "irrational," or that the two are complementary to each other. If the innate immunity can be strengthened through an intervention at mass level and in a short period of time, then it certainly must be part of a holistic public health response.[18]
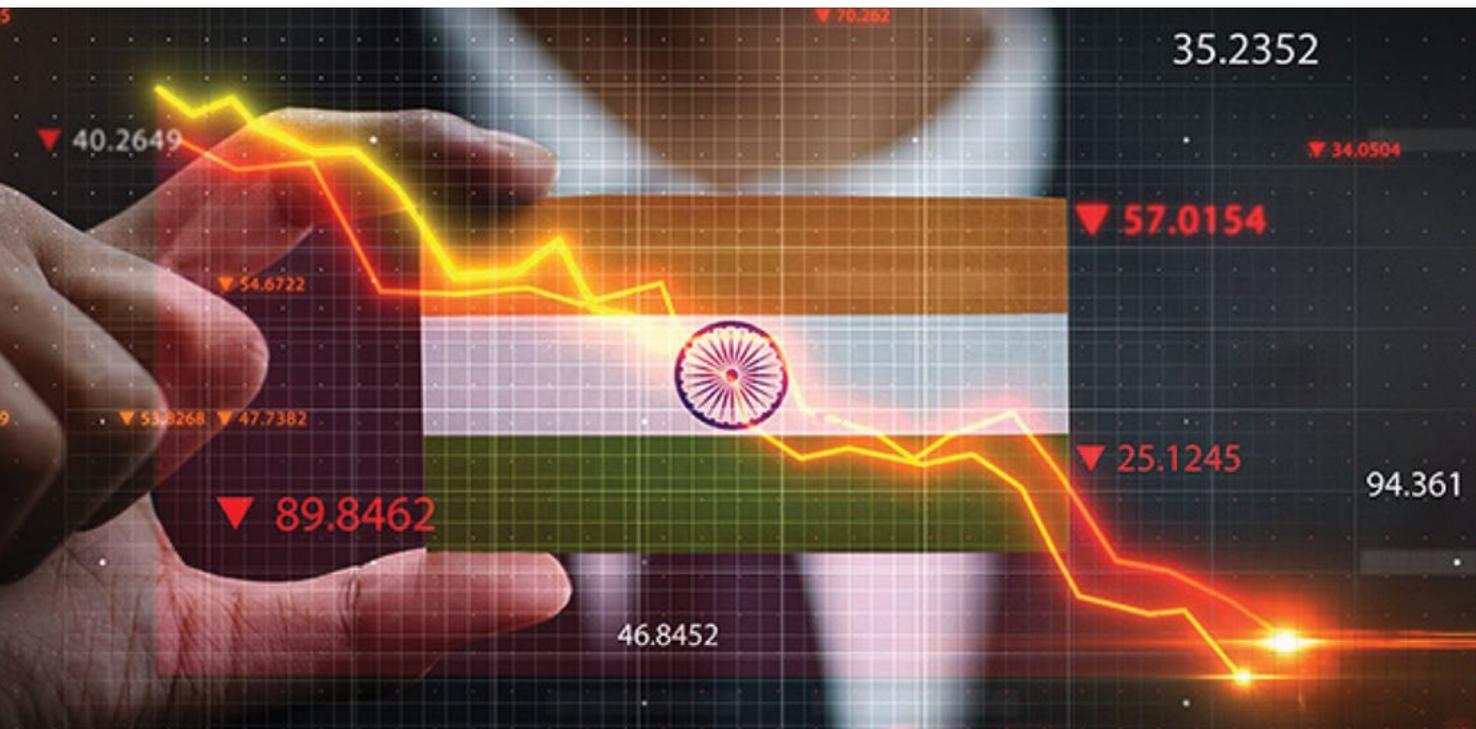
Impact of COVID-19 on Indian Economy

The atmosphere of uncertainty and crisis unleashed by the COVID-19 outbreak has significantly impacted the Indian economy. Like several other countries across the world, India resorted to lockdown to control the spread of the infection. However, the lockdown strategy implied incidental impact through restricted transport service, closed public and private offices, restricted mobilisation of citizens and shutdown businesses- millions of economic migrants were left stranded and overall, all economic activity came to a halt. The International Monetary Fund (IMF) in August 2020 expressed that the 'Great Lockdown' was the worst recession ever since the Great Depression in the 1930s and far worse than the 2008 Global Financial Crisis.

In the words of World Bank, the current pandemic has "magnified pre-existing risks to India's economic outlook". India has a number of concerns along with the present health crisis, such as unemployment, low incomes, rural distress, malnutrition, and widespread inequality, all of which have been further aggravated. The situation has added to the miseries of the poor, with job loss and food insecurity concerns. The national economy will require multi-pronged efforts to revert to a healthier phase, the foremost of which is an in-depth and honest evaluation of the damage.

Indian public health experts have estimated that the country might see its 400 million people working in the informal economy fall into even deeper poverty due to the lockdown. More will die of hunger, than the coronavirus causing COVID-19. As a relief measure, after the lockdown, the Government of India announced free rations and cash transfers to the migrants.

State of Unemployment

Centre for Monitoring Indian Economy Pvt. Ltd. (CMIE) reported a 27.1 per cent of unemployment rate for India in the week ended 3 May 2020. This has been the highest recorded unemployment rate. On analysing the monthly unemployment rate for India, it was found to be 23.52 and 23.48 per cent during April and May 2020 respectively. To put things in perspective, prior to April 2020, it didn't touch the double digit mark in any month in the last twelve months.

Further, CMIE had warned that initially the lockdown was expected to hurt the most vulnerable labour that is informally employed in unorganised sectors. Gradually, it starts hitting the more secure jobs. This was reflected in the coming months as start-ups announced lay-offs and industry associations warned of further job losses.

CMIE's Consumer Pyramids Household Survey had estimated that in March 2020, employment had dropped to 396 million. This was the lowest employment since CMIE started measuring it over four years ago. To make matters worse, even this low level dwindled by 29 per cent to 282 million in April 2020. Compared to the average of 2019-20, the fall in April is a massive 30 per cent, which translates into a loss of 122 million jobs.

Unsurprisingly, small traders and wage labourers accounted for most of these losses as employment among these dropped from an average of 128 million in 2019-20 to 116 in March 2020 and then, just 37 million in April 2020. This implies that a staggering 91 million (71%) lost their livelihood in just about a month. It represents the vulnerability of our unorganised sector as their homes are dependent on their daily earnings. They are the frontliners that take the foremost impact of a prolonged shutdown.

Category-wise Loss of Employment in April 2020
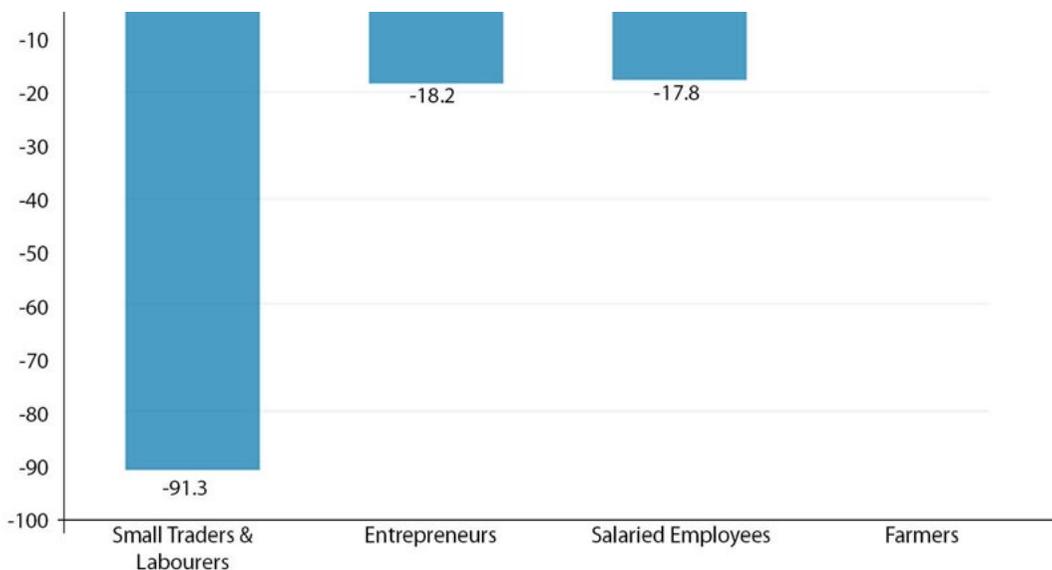
(Source: Centre for Monitoring Indian Economy Pvt. Ltd., 05 May 2020)

The next most impacted category is of larger entrepreneurs, those with fixed assets, with 23 per cent of them reporting loss of jobs. This is noteworthy because enterprises declare the status of being unemployed only if the loss seems to have caused irreversible impairment. 18 million business persons are estimated to have lost employment in April 2020. Similarly, 18 million or 21 per cent salaried employees reported job loss in April 2020. Salaried jobs are fewer in number and harder to get.

Perhaps the only sector that did not diminish in this economic mutilation was agriculture. The count of farmers increased by 6 million or by 5 per cent in April 2020 compared to the average count of farmers in 2019-20. This can be correlated with the basics that when jobs evaporate in other sectors, people revert back to their farms.

CMIE registered 8.35 per cent unemployment in the country for the month of August 2020. While this number is in line with the pre-lockdown national average data, Haryana registered the highest unemployment rate among all other states in August at 33.5 per cent. This is the second highest rate of unemployment registered by the northern state in the last four years, the highest being 43.2 per cent in April 2020.

Impact on the Unorganised Sector

The term 'unorganised sector' refers to the informal workforce that is either self-employed or works on wages rather than fixed salaries. They don't have any union or any form of protected employment terms. The Economic Survey 2018-19 surmised that the unorganized sector accounted for 93 per cent of the total workforce of the country.

COVID-19 grossly affected the workers of unorganised sector, especially the daily wagers or the Micro, Small and Medium Enterprises (MSMEs) workers as job loss and lack of alternate source of income paralysed their survival. As per a Confederation of Indian Industry (CII) report released in 2011-12, about 163.5 million people are employed in the unorganised sector in 7 major non-agricultural sectors including manufacturing, trade, hotel and restaurant industry, and construction. As the COVID-19 lockdown impacted these sectors, the workers were left unemployed and unpaid in large numbers, creating a mass migration situation across the country. Further, thousands of domestic workers who used to work in private households in various capacities were rendered jobless as well.

The Economics of Inter-State Travel Ban and Mass Migration

During the lockdown, the disparity in income and expenses for the working class, especially the unorganised sector suddenly increased . On one hand, the unorganised sector started facing job loss while on the other hand, their regular expenses including house rent and cooking were not getting any lesser. This economic incongruity along with the fear of an unstable future forced large numbers of migrant workers to move back to their places of origin. Unfortunately, among other constraints, the lockdown vehemently restricted the movement through public transport. However, the sudden loss of income source forced the migrant population residing in cities to choose walking back to their villages, often hundreds of kilometres.

The movement restrictions, however, did not deter everyone. Arrangements were made possible to transport middle-class children

studying in Kota, tourists and pilgrims, foreign citizens to connect them to special flights, and VIPs.

In May 2020, as the lockdown restrictions were eased, the Railways transported about 48,00,000 migrants back to their homes in special trains allocated for them. Initially additional charges over the normal fares were being levied but later Railways offered an 85 per cent subsidy on the train fares, the remaining being borne by state governments. A total of 91 lakh migrants traveled on both trains and buses during this period.

However, many activists and academicians have flagged that the migrants were the ones who had to pay for their tickets. As Yogendra Yadav pointed it out, the 'sending State' Government is responsible for collecting the fares from workers or paying it directly. The 'home State' can do the same, but very few states have offered it. In the last instance, the already impoverished workers have to pay the fares.

While the inter-state travel ban excluded essentials, the initial gap in streamlining of orders among various verticals led to supply chain disruptions of even the essential items in many states.

Food Security

A report published by Stranded Workers Action Network (SWAN) on 1 May 2020 based on their interaction with almost 17,000 distressed migrant workers, revealed high food security distress among the migrants since the onset of lockdown. About 50 percent of the workers had rations left for less than 1 day. Despite some improvement since mid-April 2020, about 82 per cent had not received rations from the government and 68 per cent had not received any cooked food.

On 26 March 2020, as part of a bigger relief package of 1.7 lakh crore, Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY) was announced. PMGKAY is a food security welfare scheme for ration card holders, operated by the Ministry of Consumer Affairs, Food and Public Distribution, Government of India. PMGKAY provisions for providing 5 kg of Rice or Wheat (according to regional dietary preferences) per person and 1 kg of *Dal* to each family holding a Ration Card. This is over and above the regular entitlement under the Public Distribution System (PDS).

While initially PMGKAY was launched for a period of April—June 2020, the scheme was further extended up to November 2020 in a later address to the nation by the Prime Minister. By the end of May 2020, the food ministry estimated that the scheme had reached 74 Crore beneficiaries.

On 14 May 2020, as part of Atmanirbhar Bharat Scheme, Central Government announced free food grains for the migrant workers for two months, targeting 80 million migrant workers

Kiran Mazumdar-Shaw, Executive Chairperson of biotechnology major Biocon Ltd on 28 May 2020 observed that due to the lockdown induced exodus, the migrant labour had travelled to various parts of the country without any controls. This essentially made any further lockdown pointless. She anticipated surge in cases in states such as Uttar Pradesh, Bihar and Rajasthan due to the migration of labour. **"What we really need now is prepare for tracking any outbreak and quickly bringing it under control."**

by spending INR 35 billion. Under the scheme, additional food grain to all the States/UTs at the rate of 5 kg per migrant labourer and 1 kg *Chana* per family per month for two months i.e. May and June 2020, was allocated free of cost .

However, by June 2020, the scheme to provide free rations to 8 crore non-ration card holder migrants under the Aatmanirbhar package reached only around a quarter **(**2.14 crore people) of the targeted beneficiaries. As per Government data, Andhra Pradesh, Maharashtra, Telangana, Tamil Nadu, Gujarat, Jharkhand, Odisha, Goa, Ladakh, Meghalaya, Sikkim, and Tripura distributed less than one percent of the allocated food grains. In fact, Goa and Telangana distributed zero food grains in April and May 2020 while Bihar, Gujarat, Maharashtra, Tamil Nadu, Sikkim, and Ladakh did not distribute the grains in June 2020.

In response to this under-coverage, on 1 July 2020, Secretary, Ministry of Consumer Affairs, Food and Public Distribution in a digital press conference shared that six or seven states, including Goa and Telangana, had informed the Centre that they would not be able to implement the scheme since migrant workers had already moved out of their states. Similarly, Ram Vilas Paswan, Minister of Consumer Affairs, Food and Public Distribution informed that the State governments had not distributed the full component of food allocated under the Aatmanirbhar package, as they did not have that many migrants in need. He admitted that the Centre had been generous in its initial estimate of eight crore target beneficiaries.

In a later update by the Ministry, as of 31 August 2020, out of 8 lakh tonnes of food grains (wheat and rice) allocated for the migrants, 6.38 lakh tonnes (80 per cent) was lifted by the states and Union Territories of which only 2.64 lakh tonnes (33 per cent) could be distributed to intended beneficiaries between May-August 2020. Of this 2.64 lakh tonnes of food grains, 1.17 lakh tonnes were distributed to migrants in May; 1.24 lakh tonnes in June; 15,223 tonnes in July; and only 7,643 tonnes in August.

Month wise Distribution of Free Food Grains among Migrant Workers under Atmanirbhar Bharat Package
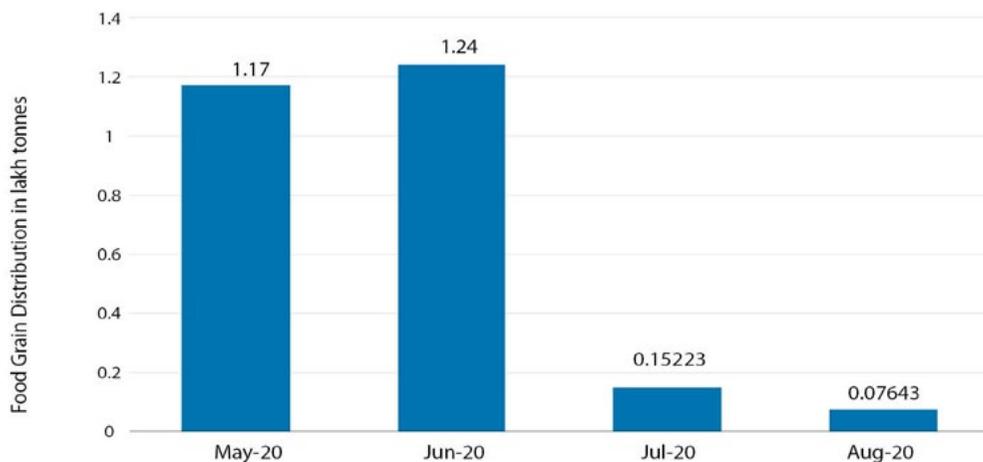
(Source: Ministry of Consumer Affairs, Food and Public Distribution)

Further, as of August 2020, while 26 out of 36 states and Union Territories had lifted 100 per cent of food grains with respect to their allocations, only four — Bihar, Chhattisgarh, Nagaland and Odisha — reported 100 per cent distribution of food grains among the beneficiaries. Andhra Pradesh reported nil distribution and Telangana and Goa reported 1 per cent and 3 per cent distribution, respectively. Gujarat lifted about 88 per cent of food grains under this scheme, but distributed only 1 per cent. This scheme of free food grains for migrants ended on 31 August 2020 as no State asked for its extension.

Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)

Further, the average daily wages under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) were increased to INR 202 from the earlier INR 182 as of 1 April, 2020 to help provide jobs and wages to workers. However, as per official government data, in April 2020, only 20 per cent of the number of people who were provided work in the same month the previous year were employed under the MGNREGA. In the month of April 2020, 34 lakh households were provided work as compared to 1.7 crore in April of 2019, lowest for any month in at least seven years. This is even lower than March 2020 when more than four times the number of households – 1.57 crore – were provided work. Of the 34 lakh households who were provided employment in April 2020, 20 lakh – or about 57 per cent– were accounted for in only two states – Andhra Pradesh and Chhattisgarh. A majority of states – 19 out of 34 – provided work to less than 10,000 households. Some states like Telangana did not record any work at all.

The economists have highlighted the fear of being infected as well as lack of clarity on the allowed MGNREGA activities as major factors behind this steep reduction. Economist Reetika Khera, Professor at IIM Ahmedabad, in an interview with The Wire urged the Government to compensate the workers for this wage loss. Khera suggested the government to ease the process of providing work, to pay with cash at work site and to make a part payment in the form of food transfers.

Walking the Thin Poverty Line

A sizeable portion of informal workers are the primary income-earners of their families. When crisis befalls them, a whole family suffers as it is highly dependent on a single person's income. As per the official poverty line, last estimated in 2011-12, nearly 22 per cent Indians were below poverty line. This number ideally must have lowered since then, considering the exponential growth in country's GDP and slower population growth. However, the migrants' plight that has become bare since the COVID-19 lockdown speaks of a grim reality. Millions float just above the official poverty line and are constantly living a tight roped life, with the possibility of falling below the official poverty line. The pandemic has reminded us that it only takes an illness, a job loss, death of an earning member for a vulnerable family to fall back into poverty. What is worse, the economic setbacks created by the pandemic could also pull the lowest strata of the 'middle class'.

As per the May 2020 SWAN report titled '32 Days and Counting', 64 per cent of people had less than INR 100 left with them and more than 97 per cent had not received any cash relief from the government[1].

Gig-economy- Organised or Unorganised?

Somewhere between the official classification of formal and informal lie the jobs falling in the newly expanding 'gig economy'. Gig workers are employees with contracts that exist outside traditional employment, and a gig economy is based on temporary and contract-based flexible jobs, which involves connecting clients and employees via online platforms. With technology increasingly integrated into varying forms of work, self-employed, independent contractors have been using online based corporate platforms to engage consumers. While the gig economy has been credited for creating millions of new jobs, the fact that they mostly comprise of temporary or part-time jobs like that of delivery persons, app based taxi drivers, freelancers, etc. A major section of these gigs comprises of grass root level workforce who were the frontliners when it came to facing the COVID-19 and lockdown influenced unemployment.

While companies continued to operate and even expand operations during the lockdown, they were found to be outsourcing the responsibility for the risks that delivery workers endure to consumers, by asking them to contribute financially to support workers.

A pre-COVID-19 world report by industry body ASSOCHAM had estimated the gig economy in India to grow to reach around INR 34 lakh crores by 2023. The pandemic has unleashed unprecedented impact on this sector as well. With rising unemployment in the unorganised sector, there will be a steep surge of labour in the gig economy, leading to lowering of average wages. Further, this sector is largely driven by consumption of services by the urban middle class. As the e-commerce sector will evolve to survive and expand in a post-COVID-19 world, the role of gig economy will also be reinvented.

Impact on Agriculture and Allied Sectors

Indian farmers are bound to face the risks of low rainfall, price volatility and rising debts every year. However, the year 2020 has brought in new challenges in front of the sector already struggling with low growth and high disguised unemployment. The nationwide lockdown was implemented just around the harvest time of rabi crop. Usually farmers hire migrant labourers during harvest and rent harvesting equipment to save money. However, the lockdown created a shortage of both labour and equipment. Consequently, some places witnessed abandoning of crops, while others saw delayed yet expensive harvest. Further, as the migrant labour returned to their native places, hands in field in those locations increased.

Another cause of concern had been the severely affected supply chains especially at the beginning of the lockdown when transport was restricted. Drivers abandoned trucks full of produce in the middle of interstate highways. This darkened the supply shortage in markets while food rotted in transit. While this supply shortage increased the price for the consumer, the farmer faced price crash. Also, the prices of meat and poultry took severe hit as these were not in demand due to the fear of contracting COVID-19 through meat products.

Another issue that is cause for concern is the availability and access to seeds, fertilizers and pesticides for the next crop season. While large landholding farmers and businesses may be able to absorb these shocks, small farmers go through enormous pressure as they work with limited resources and high risk.

Industry-Wise Impact

The lockdown triggered by COVID-19 has brought disruptions across various Indian industries due to supply shock and labour force unavailability. On 23 March 2020, industry body FICCI had shared a brief survey-based report on the impact of COVID-19 on the industry which included sector wise analysis and suggestive measures. The analysis even before the announcement of the nation wide lockdown had marked stringent cash flow, disrupted demand and supply chains, crashing financial markets and plummeting trade. Accordingly, the industry body had extended suggestions to RBI as well as the Government.

FICCI in its latest Economic Outlook Survey released in July 2020 projected the country's annual median GDP growth for 2020-21 at (-) 4.5 per cent, marking a sharp fall from the growth estimate of 5.5 per cent reported in the January 2020 survey. Here is a brief analysis of the impact of coronavirus on some of the major industries.

Pharmaceutical Industry

The Indian pharma industry is the third-largest in the world by volume. It manufactures almost 60 per cent of the vaccines used in the world.

The fight against COVID-19 is highly dependent on generic drugs. India is the largest provider of generic medicines globally. It has been meeting more than 20 per cent of the world and almost 50 per cent of the US's generic drug requirements. Unfortunately, Indian manufacturers have been disproportionately dependent on China for key starting materials (KSMs), intermediate and active pharmaceutical ingredient (APIs) as China-the epicentre of the outbreak-

caters to nearly 70 per cent of Indian pharma companies' requirements. Post pandemic the limited or non-availability of raw material or API from China are impacting India's pharma exports.

The restrictions on movement due to lockdowns made it impossible for the manufacturers of generic drugs to launch products or conduct clinical trials. Simultaneously, cash flows from new generic drug launches were also impacted adversely. Further, an Indian pharmaceutical facility can sell drugs in the US only after it has been inspected and approved by the US FDA. With the ban on international travel, inspection is naturally out of question, rendering it impossible for Indian drug companies to sell in the US and other overseas markets.

However, there is a silver lining, provided the pharma sector provides end-to-end indigenous production. Steps have been taken by the Indian Government to incentivise the production of APIs and KSMs under the 'Make in India' programme to reduce the dependence on China.

Automobile Industry

Traditionally, automobile industry is considered the measurement standard of a country's economy. While the automobile sector was already undergoing falling sales in the pre-COVID-19 scenario in India, the lockdown disrupted the supply chains. This impacted the Indian manufacturers as they are majorly dependent on China for auto components. In 2018-19, INR 33,596 crores worth automotive parts were manufactured in China and imported to the Indian companies.

However, as the industry comes out of lockdown, the sales have picked up substantially. From

nil April 2020 sales and 80 to 90 per cent dip in domestic sales in May 2020, the industry is significantly gaining on numbers. Maruti Suzuki and Hyundai Motors together hold nearly 70 per cent market share. While Maruti announced a 3.8 times jump in June 2020 over May 2020, Hyundai declared over three times rise in sales in the same month.

This recovery could be credited to multiple factors. Health and safety concerns arising out of public transport could be driving the sale of personal use cars, especially among first-time buyers. Added to this could be the pent up demand due to stringent lockdown restrictions in April and May 2020. While urban areas have been more impacted by COVID-19 and the lockdown, industry experts have observed a faster recovery of the industry in rural India.

Tourism Industry

Travel and hospitality industry has been perhaps one of the first economic casualties of the pandemic. The whole tourism value chain across hotels, travel agents, tour operations, destinations, restaurants, family entertainment venues and air, land and sea transportation have been hit. As per a 2018 report by World Travel and Tourism Council (WTTC), the tourism sector in India generated 9.2 per cent of India's GDP in 2018 and contributed 8.1 per cent of the total employment opportunities generated in the country. The tourism sector's contribution to the GDP is mainly (88 per cent) by domestic travel, and the remaining 12 per cent through international visitors. While the dark period for the industry began as the infection spread across the world and countries started restricting movement, the sector is likely to remain affected by the pandemic for a longer period of time. This is because tourism is considerably associated with the consumers' ability and desire to spend for leisure; something that has been severely hampered due to the spiraling economy, rising unemployment and sustained culture of physical distancing. This slump in consumption demand for tourism and hospitality is expected to continue till at least 2021.

Aviation Industry

After the COVID-19 breakout, both domestic and international airline operations were

Photo Source: -Samir Jana via gettyimages

halted by the Indian authorities, causing huge losses incurred by the airlines. In May, Crisil had estimated revenue losses of INR 24,000–25,000 crore for airlines and airports as air travel remained suspended due to the national lockdown.

Even after the operations began on 25 May 2020 after a sabbatical of two months, passenger demand remained low as airlines recorded load factors of just 44-57% in the last week of May 2020. Further, the airlines have been allowed to operate only 33 per cent of their total capacity by the Government and international air travel remains grounded. June 2020 data from the Directorate General of Civil Aviation (DGCA) showed that domestic air passenger traffic fell by 43.39 per cent year-on-year from January to May 2020. The total expected loss of the aviation industry in the first quarter of Financial Year 2021 is about USD 3-3.6 billion. The industry has been focusing on cost cutting while gradually scaling operations; there has been no government bailout package for the industry as of October 2020.

Impact on e-Commerce

The impact on the e-commerce has been different depending upon the industry. The advent of the virus and the lockdown initially dramatically disrupted e-commerce as well. Due to the lockdown, the movement of their supplies as well as delivery partners became restricted. The sector also faced confusion about the guidelines during the first two lockdown phases. However, over the months following the spread of COVID-19 in the country, various industries active in the e-sector adapted themselves to survive and thrive despite the adversity. In May 2020, GlobalData, a London-based data analytics firm predicted that the 'positive push' due to the COVID-19 outbreak will accelerate the

growth of India's e-commerce market to INR 7 trillion by 2023. On a similar note, a Bain & Company report predicted the Indian e-retail market to reach nearly 300 to 350 million shoppers over the next five years. It projected the Indian e-commerce market to grow at 30 per cent compounded annual growth rate (CAGR) over the next five years.

A major change became apparent in the consumer behaviour. Due to the sudden declaration of lockdown and the panic it drew, large scale shopping of household products led to supply shortage. Further, as movement became restricted, malls, supermarkets and retail stores became inaccessible. This pushed consumers, especially in the urban areas to online stores for everyday necessities and essential commodities. Even as the lockdown restrictions have been lifted, consumers are reluctant to revert to their old shopping habits due to the fear of getting infected and rather continue to prefer online shopping.

Impact on MSMEs

According to the latest available (2018-19) Annual Report of Department of MSMEs, there are 6.34 crore MSMEs in the country. Around 51 per cent of these are situated in rural India. Together, they employ a little over 11 crore people but 55 per cent of the employment happens in the urban MSMEs. More than 99 per cent of all MSMEs belong to the micro category. While micro enterprises are equally distributed over rural and urban India, small and medium ones are predominantly in urban India. Seven States — Uttar Pradesh (14%), West Bengal (14%), Tamil Nadu (8%), Maharashtra (8%), Karnataka (6%), Bihar (5%) and Andhra Pradesh (5%) — account for 50 per cent of all MSMEs in India.

Table 1 Revised Definition of MSME (came into effect July 1, 2020)		
Manufacturing Enterprises and Enterprises rendering Services		
Classification	Investment in Plant and Machinery/Equipment (INR)	Annual Turnover (INR)
Micro	Upto 1 crore	Upto 5 crore
Small	Upto 10 crore	Upto 50 crore
Medium	Upto 50 crore	Upto 250 crore

Table 2 Estimated Employment in MSME Sector (2018-19)				
Category	Rural (lakh)	Urban (lakh)	Total (lakh)	Share (%)
Manufacturing	186.56	173.86	360.41	32
Trade	160.64	226.54	387.18	35
Other Services	150.53	211.69	362.22	33
Electricity (non-captive generation and transmission)	0.06	0.02	0.07	-
Total	497.78	612.10	1109.89	100

Table 3 Estimated Employment in MSME Sector (2018-19)				
Category	Micro (lakh)	Small (lakh)	Medium (lakh)	Total (lakh)	Share (%)
Rural	324.09	0.78	0.01	324.88	51
Urban	396.43	2.53	0.04	309.00	49
All	630.52	3.31	0.05	633.88	100

As COVID-19 adversely impacted the supply chains and the availability of labour, MSMEs struggled to keep up the daily basic operations and pay salaries. Most of these firms don't have sufficient amount of surplus cash to float past the unexpected crisis, leading to the job losses.

What the sector needs most at this juncture is liquidity to keep the operations going. A positive step from the Government was in terms of the EPF as the Finance Minister announced that the Government would be paying the entire EPF contribution of both the employer and the employee for three months for establishments with up to 100 employees and 90 percent of the employees earning less than INR 15,000. This support could be extended to cover more enterprises for a longer duration as it gives more liquidity in the hands of the organisations.

Considering that real estate too is undergoing fall in valuation, the value of property as collateral will also decrease. Hence, easy and low-interest loans, equivalent to at least two to three months of operational costs, must be made available to MSME sector immediately. Further, it is also suggested that some percentage of survival wages should be supported by the Government to help

the MSMEs maintain their labour during the critical period. Similarly, GST exemptions for some time, swifter refunds, liquidity to rural India through ongoing schemes can also be considered to boost the demand in the MSME sector.

Fiscal Consequences of COVID-19

India implemented the world's biggest and one of the most stringent lockdowns to tackle the pandemic spread. However, this abrupt shutdown shocked the already slowing economy, the foremost evidence of which

S. No.	Package Item	Amount (Rs Cr)	Major Features
	Table 4 Atmanirbhar Bharat Package		
1.	Tranche 1	5,94,550	• Rs 3 lakh crore collateral-free loans and Rs 50,000 crore equity infusion for MSMEs through Fund of Funds • Liquidity relief measures worth Rs 30,000 crore for NBFCs, HFCs etc. and Rs 90,000 crore for power distribution companies
2.	Tranche 2	3,10,000	• 'One nation one ration card' to allow migrant workers to buy ration from any depot in the country • Special credit facility of Rs 5,000 crore to support around 50 lakh street vendors who will have access to an initial Rs 10,000 working capital • About Rs 2 lakh crore for farmers through Kisan credit cards • 2.5 crore farmers, including fishermen and animal husbandry farmers, would be able to get institutional credit at a concessional rate
3.	Tranche 3	1,50,000	• Rs 1 lakh crore agriculture infrastructure fund for farm-gate infrastructure • Rs 20,000 to be provided to fishermen through Pradhan Mantri Matsya Sampada Yojana • Rs 10,000 crore to formalize micro food enterprises • Rs 4,000 crore for herbal cultivation • Rs 15,000 crore Animal Husbandry Infrastructure Development Fund • Rs 500 crore for bee-keeping related infrastructure development
4.	Tranche 4 and 5	48,100	• Easing utilization of the Indian air space to reduce air travel cost. • An additional Rs 40,000 crore for the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) • Commercial mining in the coal sector and privatizing discoms in metros to streamline their functions for better accountability
	Sub total	**11,02,650**	
5.	Earlier measures including PMGKY	1,92,800	
6.	RBI liquidity stimulus	8,01,603	
	TOTAL	**20,97,053**	

Source: Financial Express

came in the form of April-June 2020 GDP estimates. Indian GDP witnessed the worst contraction as compared to other severely COVID-19 impacted economies.

The Centre announced a significant fiscal stimulus to cushion the pandemic's impact on the socio-economy of the country. However, without receiving an equivalent rise in revenues, Centre's fiscal deficit is expected to break all previous records.

The Union as well as various states had presented their budgets for 2020-21 before the COVID-19 pandemic spread in the country. Thus, the fiscal deficit estimates were based on normal projections with a hope of continuing positive economic growth. However, in the post COVID-19 scenario, various reports have estimated massive shooting up of fiscal deficit of the Centre as well as states. A report by Care Ratings released in September 2020 estimated the combined fiscal deficit of Centre and States to be around 13 per cent of GDP, 7 per cent more than budget estimate. In October 2020, former RBI Governor C Rangarajan estimated this number to be about 13.8 to 14 per cent of GDP.

COVID-19 Relief Package: On 12 May 2020, the Prime Minister announced Rs 20 lakh crore Atmanirbhar Bharat package, about 10 per cent of the Indian GDP. Over the next five days, Finance Minister detailed the stimulus package — a mix of fiscal support, monetary support and ease of doing business processes.

The package includes the Reserve Bank of India's 8.01 lakh crore rupees stimulus released in batches since February to inject liquidity and the 1.92 lakh crore rupees relief announced by the Government in March 2020, leaving about 10.7 lakh crore rupees for spending. The Finance Minister also provided a tranche-wise complete break-up of the stimulus.

The Aatmanirbhar package is formally among the most generous ones in the world. However, a report by Barclays had estimated that of the government's INR 20.97 lakh crore stimulus package, the additional cost could not be greater than INR 2.5 lakh crore, roughly 1.2 per cent of the GDP.

Economists and industry leaders have welcomed the allocation of INR 3 lakh crore collateral-free loans and INR 50,000 crore equity infusion for MSMEs. However, concerns about coverage are there; not all MSMEs may benefit from the provisions announced by the government. The fiscal stimulus may offer incremental short-term benefits only to about 50 lakh MSMEs- just 8 per cent of total MSMEs in the country.

In May 2020, former RBI governor **Raghuram Rajan** called India's INR 20 lakh crore fiscal stimulus inadequate for recovering the economy. He had said that while the package provided free foodgrains, migrant workers, rendered jobless by the lockdown, needed money to buy essential consumables and to pay rent. **"It's important to both send more money and open foodgrain. They need vegetables, they need oil to cook, they need other stuff that means a certain amount of money along with foodgrain. They need shelter."**

Table 5 Quarterly Estimates of GVA at Basic Prices in Q1 (April-June) of 2020-21 (at 2011-12 Prices)					
Industry	April-June (Q1) (in crore rupees)				
	2018-19	2019-20	2020-21	percentage change over previous year	
				2019-20	2020-21
1. Agriculture, forestry and fishing	4,27,177	4,39,843	4,54,658	3.0	**3.4**
2. Mining & quarrying	88,634	92,807	71,209	4.7	**-23.3**
3. Manufacturing	5,61,875	5,78,936	3,51,396	3.0	**-39.3**
4. Gas, electricity, water supply and other utility services	74,998	81,628	75,877	8.8	**-7.0**
5. Construction	2,49,913	2,62,828	1,30,750	5.2	**-50.3**
6. Trade, hotels, transport, communication and services related to broadcasting	6,09,330	6,30,860	3,34,284	3.5	**-47.0**
7. Financial, real estate & professional services	7,57,850	8,03,322	7,60,491	6.0	**-5.3**
8. Public administration, defence and other services	3,87,589	4,17,483	3,74,656	7.7	**-10.3**
GVA at Basic Prices	**31,57,366**	**33,07,707**	**25,53,320**	**4.8**	**-22.8**

Source: Ministry of Statistics and Programme Implementation

MSMEs which don't have existing loans or are not stressed/NPAs do not qualify for the emergency credit line. Thus, such small enterprises would not be able to solve their issues like paying salaries, making vendor payments and buying material through this stimulus. The industry would benefit more exhaustively through more direct and immediate benefits such as support in employee wages, income tax benefits, instant loans basis GST profile without any conditions. Lakhs of MSMEs are driven by demand from other sectors like automobiles, aviation, hotels, restaurants and tourism. All these are currently plummeted. The relief package hardly introduced any direct support for these sectors. Direct income support would support the MSMEs as they are less likely to take loans and protect employees.

Quarterly GDP Estimates: As per the provisional estimates released by Ministry of Statistics and Programme Implementation (MoSPI) on 31 August 2020, India's GDP for the April-June quarter (Q1) of the financial year 2020-21 slipped by a sharp 23.9 per cent. This implies that the domestic economic activity in April-June 2020 was 23.9 per cent lower than in April-June 2019. The GDP had expanded by 5.2 per cent in the corresponding quarter of 2019-20.

The sector wise Q1 data (Table 19.5) showed contractions in all the sectors except agriculture. Construction sector witnessed a drop of a more than half (50.3 per cent); the manufacturing industry saw a 39.3 per cent decline; and trade, hotels, transport, communication and services related to

broadcasting contracted by a massive 47.0 per cent. Electricity, gas, water supply and other utility services contracted by 7 per cent. Only the agriculture, forestry and fishing industry witnessed a growth of 3.4 per cent in the first quarter of 2020-21.

The major driver of Indian GDP is consumption which contracted by 27 per cent in the first quarter. The other major pillar of growth-investment demand- is reflected by Gross Fixed Capital Formation (GFCF) which contracted by nearly 47 per cent. Indian economy has been witnessing a negative pattern in investment growth for the last three quarters; furthered by the pandemic.

A few days before this data was released by MoSPI, on 27 August 2020, Finance Minister Nirmala Sitharaman had hinted towards facing significant economic contraction and had termed COVID as an 'Act of God'. "This year we are facing an extraordinary situation that even below 10 per cent approximate estimation you are facing an 'Act of God' which might even result in a contraction of the economy," she said.

V-Shaped Recovery: The 23.9 per cent GDP contraction also brought India among the worst COVID-19 hit economies in the world. While India and other major economies grapple with economic turmoil, China is the only economy releasing positive figures. As of September 2020 quarter, with a continued positive GDP growth (4.9 per cent), China seems to have shaped a V-shaped recovery.

Sharp Contraction of Major Virus Hit Economies in June 2020 Quarter

CHINA 3.2
US -9.5
GERMANY -11.7
ITALY -17.3
UK -21.7
INDIA -23.9
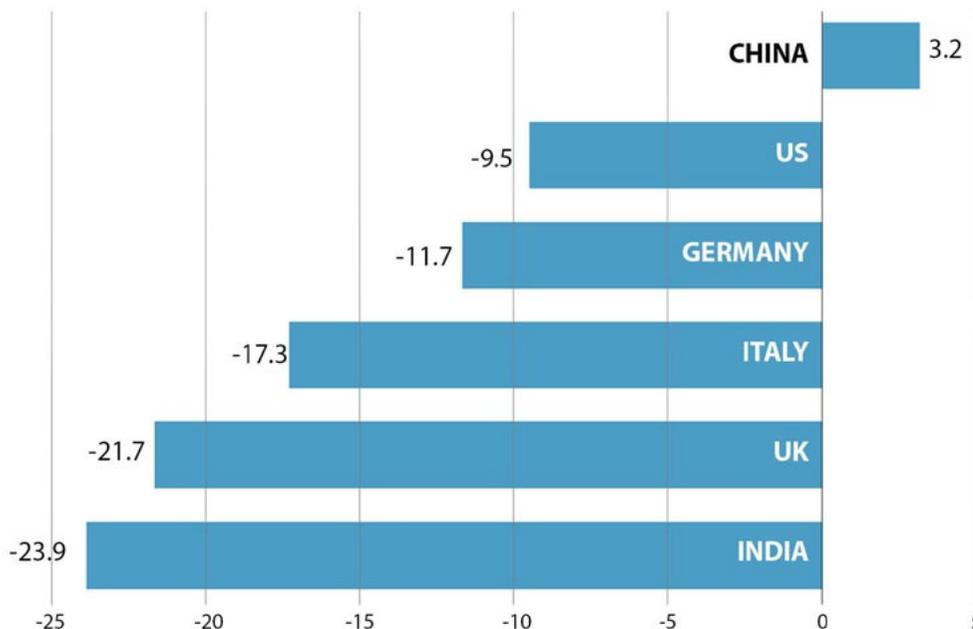
(Source: The Quartz)

After the Government's data showed that India's economy contracted by a record 23.9 per cent in the June 2020 quarter, **Raghuram Rajan** compared the Indian situation to two other major virus-hit economies-Italy and the US, and warned that India's **"numbers will probably be worse when we get estimates of the damage in the informal sector."**

The Indian Government is hopeful of a V-shaped recovery in the coming quarters for India as well. A finance ministry report on the economic outlook, published on 31 August 2020, highlighted that several high-frequency indicators such as manufacturing purchasing managers' index (PMI), eight core industries, E-way bills, Kharif sowing, power consumption, railway freight, cargo traffic and passenger vehicle sales have seen growth (or lower contraction).

However, in absolute GDP growth terms, India is far from any kind of recovery considering the slump in private consumption demand, state of unemployment and the wreckage of the informal economy. A V-shaped recovery needs to be supported with additional stimulus into key industries and fresh policy measures directed at creating jobs and demand. Even if India witnesses a V-shaped recovery, sustaining it will be tough considering the pause observed in government expenditure.

While lifting lockdown restrictions has breathed some life into the Indian economy as compared to April to June 2020, the real challenge is going to be sustaining the pace of recovery.

Annual Growth Projections: Even before the GDP data for April-June 2020 were released, various organisations had been estimating significant contraction in Indian GDP. IMF in June 2020 estimated India's economy to contract by 4.5 percent in 2020 following "a

longer period of lockdown and slower recovery than anticipated in April". The international organisation expected India to bounce back in 2021 with a robust 6 percent growth. However, the latest IMF projections released in October 2020 further contracted GDP estimates by 10.3 per cent. On a positive note, IMF has also estimated a sharp upturn of 8 per cent in FY 2020-21. In 2019, India's growth rate was 4.2 percent.

Other major estimates of India's GDP contraction in 2020 include Goldman Sachs (contraction of 14.8 per cent), Asian Development Bank (contraction of 9 per cent), RBI (contraction of 9.5 per cent), the World Bank (9.6 per cent), the Organisation for Economic Co-operation and Development (contraction of 10.2 per cent), and UN Conference on Trade and Development (contraction of 5.9 per cent). In term of growth of Indian economy during FY 2021-22, all these organisations have given sharply bouncing figures ranging between 3 and 9 per cent.

Balance of Trade: In terms of export and import, India posted a trade surplus of $790 million in June 2020, a first since 2002. As COVID-19 plunged the domestic demand for crude oil, gold and other industrial products, Indian imports fell March 2020 onwards-reflecting a slowing economy. Merchandise imports contracted 47.59 per cent in June 2020 to USD 21.11 billion from a year ago,

while exports fell 12.41 per cent to USD 21.91 billion, leading to a marginal trade surplus. In June 2020, crude oil imports fell 55.29 per cent year-on-year to USD 4.93 billion due to a tumble in global commodity prices as well as local demand, while gold imports were down by more than 77 per cent to USD 608.7 million.
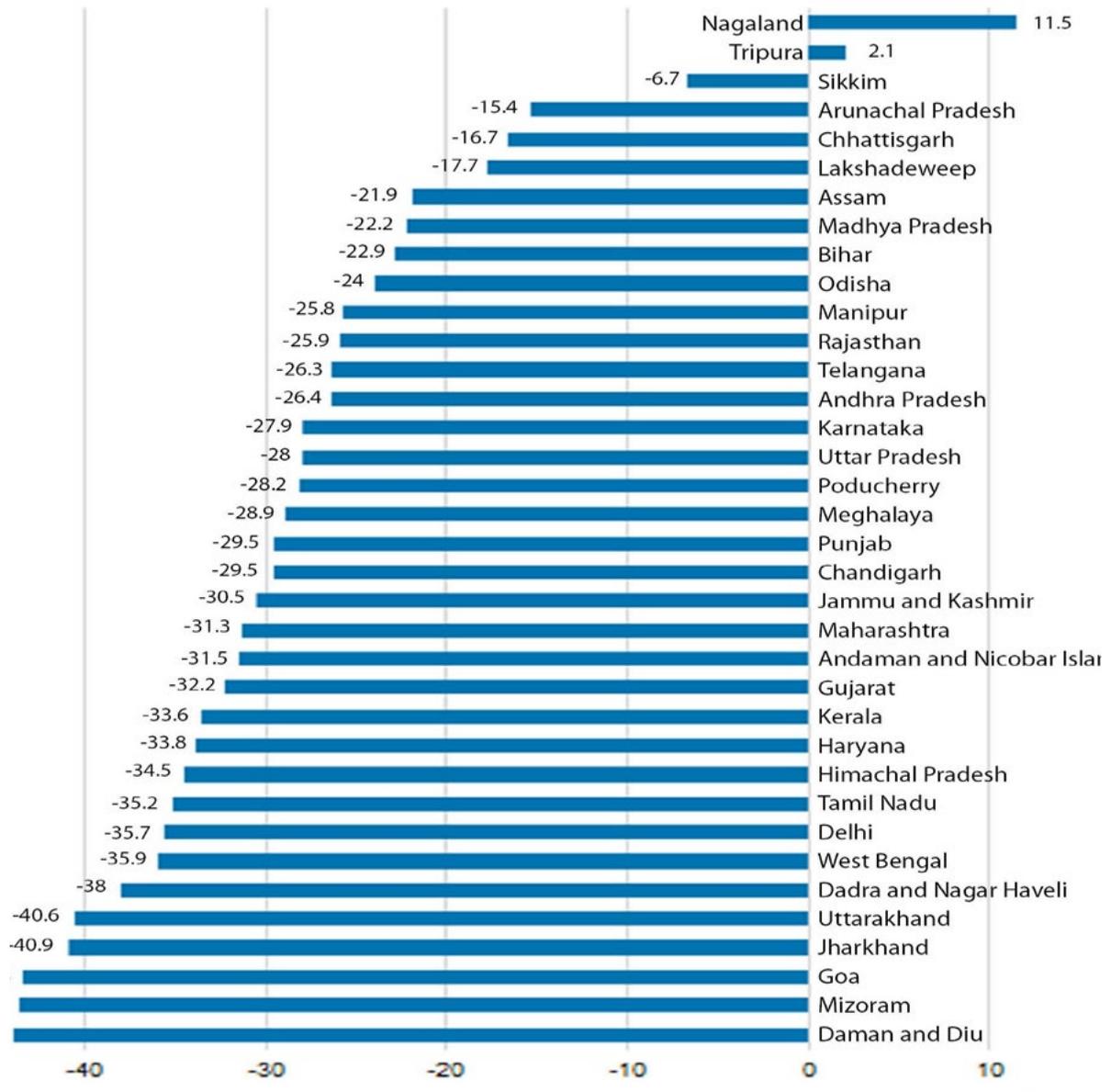
As the Indian economy unlocked June 2020 onwards and imports started increasing

S No.	State/UT	2019-20	2020-21	Difference	Decline
		(in Rs. Crore)			%
1.	Andaman and Nicobar Islands	151	103	-48	-31.5
2.	Andhra Pradesh	11187	8237	-2950	-26.4
3.	Arunachal Pradesh	235	199	-36	-15.4
4.	Assam	4062	3171	-891	-21.9
5.	Bihar	5294	4081	-1213	-22.9
6.	Chandigarh	821	578	-243	-29.5
7.	Chhattisgarh	10266	8549	-1717	-16.7
8.	Dadra and Nagar Haveli	777	482	-295	-38
9.	Daman and Diu	483	270	-213	-44
10.	Delhi	18524	11907	-6617	-35.7
11.	Goa	1788	1012	-776	-43.4
12.	Gujarat	32503	22049	-10454	-32.2
13.	Haryana	23975	15869	-8106	-33.8
14.	Himachal Pradesh	3390	2219	-1171	-34.5
15.	Jammu and Kashmir	1680	1169	-511	-30.5
16.	Jharkhand	10091	5967	-4124	-40.9
17.	Karnataka	34362	24763	-9599	-27.9
18.	Kerala	7861	5220	-2641	-33.6
19.	Ladakh	-	35	-	-
20.	Lakshadweep	7	6	-1	-17.7
21.	Madhya Pradesh	11626	9041	-2585	-22.2
22.	Maharashtra	75910	52154	-23756	-31.3
23.	Manipur	162	120	-42	-25.8
24.	Meghalaya	645	459	-186	-28.9
25.	Mizoram	128	72	-56	-43.6
26.	Nagaland	122	136	14	11.5
27.	Odisha	13011	9889	-3122	-24
28.	Puducherry	758	544	-214	-28.2
29.	Punjab	6497	4580	-1917	-29.5
30.	Rajasthan	13576	10066	-3510	-25.9
31.	Sikkim	916	855	-61	-6.7
32.	Tamil Nadu	30528	19797	-10731	-35.2
33.	Telangana	15949	11762	-4187	-26.3
34.	Tripura	276	270	-6	-2.1
35.	Uttar Pradesh	27170	19563	-7607	-28
36.	Uttarakhand	6327	3760	-2567	-40.6
37.	West Bengal	18389	11781	-6608	-35.9

Table 6 GST Collection from Domestic Collection in April-August (2020-21 vs 2019-20)

(Source: Ministry of Finance)

Percentage Change in State-wise GST Revenue for April to August (2020-21 as compared to 2019-20)

State	Percentage Change
Nagaland	11.5
Tripura	2.1
Sikkim	-6.7
Arunachal Pradesh	-15.4
Chhattisgarh	-16.7
Lakshadeweep	-17.7
Assam	-21.9
Madhya Pradesh	-22.2
Bihar	-22.9
Odisha	-24
Manipur	-25.8
Rajasthan	-25.9
Telangana	-26.3
Andhra Pradesh	-26.4
Karnataka	-27.9
Uttar Pradesh	-28
Poducherry	-28.2
Meghalaya	-28.9
Punjab	-29.5
Chandigarh	-29.5
Jammu and Kashmir	-30.5
Maharashtra	-31.3
Andaman and Nicobar Island	-31.5
Gujarat	-32.2
Kerala	-33.6
Haryana	-33.8
Himachal Pradesh	-34.5
Tamil Nadu	-35.2
Delhi	-35.7
West Bengal	-35.9
Dadra and Nagar Haveli	-38
Uttarakhand	-40.6
Jharkhand	-40.9
Goa	
Mizoram	
Daman and Diu	

again. In September 2020, India recorded a trade deficit of USD 2.720 billion. However, this number was well below the USD 11.67 billion deficit observed in September 2019. Considering the April to September 2020 period, the trade gap narrowed sharply to USD 20 trillion from USD 83.25 trillion in the same period in 2019.

State Level Finances: The States have witnessed 70-80 per cent drop in tax collections in April 2020 owing to nationwide lockdown imposed to curb the spread of Coronavirus. Kerala's state GST collection in April 2020 dropped 78 per cent to Rs 517 crore against Rs 2,407 crore a year ago. Odisha also saw its State GST collection fall by 64 per cent in April 2020

to Rs 376 crore against Rs 1,041 crore in 2019. However, the overall tax collection of Odisha was not as severely affected as that of Kerala. This was because Odisha's own collection accounts for less than half of its total revenue while the same for Kerala is almost 70 per cent. The Delhi Government as well as the Andhra Pradesh Government imposed an excess 70-75 per cent 'corona tax' on liquor to compensate for their dwindling tax collections.

The issue of GST compensation cess has become a bone of contention between the Centre and states at the GST Council. States were promised compensation for giving up their powers to levy indirect taxes on goods and services after GST regime began in July 2017. However, since the last fiscal, states have not been paid this compensation. The Centre has been putting forth that cess collection has been drastically impacted due to economic slowdown. The centre released over 1.65 lakh crore as GST compensation to states for 2020, including 13,806 crore for March, while cess collected for GST compensation was only 95,444 crore. As per Finance Minister, the Coronavirus pandemic has created a shortfall of 2.35 lakh crore for FY 2021 by grossly impacting the goods and services (GST) collection.

The Centre has asked states to borrow for covering the revenue shortfall. However, States, especially opposition ruled ones, have been counter arguing that it should be Centre's liability to borrow and provide to states, considering that the majority of taxation powers have been given up by the Staes to the Centre under GST regime. In August 2020, the

GST collection declined to Rs 86,449 crore, 12 per cent lower compared to the corresponding month last year.

In response to a question in Lok Sabha on 14 September 2020, Ministry of Finance shared data on state-wise GST collection from domestic transactions, which shows significant revenue losses for 34 of the 36 states and UTs for the period of April-August 2020 as compared to the same period in the previous year.

Among the States, Mizoram, Goa, Jharkhand and Uttarakhand have seen their GST collections falling by more than 40 per cent during April to August in 2020-21 as compared to the previour year. Goa, Uttarakhand, and Himachal Pradesh have taken a drastic hit possibly because of the fact that the lockdown impacted their tourism season.

Most of the large states have seen a reduction of 20 per cent or more in their GST collection year-on-year. The revenue loss was lower in less industrialised states such as Chhattisgarh, Bihar, Madhya Pradesh, Odisha and Assam than states like Tamil Nadu, Gujarat or Maharashtra. Chhattisgarh was the only large state that bore a less than 20 fall in revenue in the given period.

Surprisingly, Nagaland is the only state that witnessed an increase in its GST collection for the given months over the previous year. The government has attributed the declines to the lockdown and relief measures for taxpayers such as waiving the interest and late fee and extending the return filing dates.

Recent Suggestions from the Industry

On 22 September, 2020, an empowered group meeting was held which included representatives of Confederation of Indian Industry (CII), FICCI, MSME, Federation of Indian Micro, Small and Medium Enterprises (FISME) along with officials of NITI Aayog, MSME Ministry, Department for Promotion of Industry and Internal Trade, Ministry of Commerce, and Ministry of Finance.

At the meeting, the CII suggested to extend the unutilized funds under the emergency credit line guarantee scheme (ECGLS) to stressed sectors besides allowing alternate investment funds to function as multiple bad banks and recapitalisation of public sector banks. The CII also sought better coordination between centre, state and city authorities on adhoc lockdown and opening up as it affects supply chains and is impacting recovery.

The MSME industry raised four key issues in the same meeting- pertaining to liquidity, lack of demand for MSMEs, public procurement through MSMEs, and delayed payments with various central government agencies.

FISME suggested a mandatory registration of all Government (center & state) buyers on Trade Receivables Discounting System (TReDS) platforms, and allowing insurance companies to offer bank guarantees. TReDS is an online platform for facilitating the financing of trade receivables of MSMEs which ultimately promotes transparency and discipline for timely payment. The MSME industry was assured at the meeting that the mandatory 25 per cent procurement from MSME by PSUs is being closely observed by the Government.

Way Forward

India is one of the most severely affected countries in the world both in terms of cases and deaths and also its economy. The crisis brought upon by COVID-19 has forced humanity to question physical survival as well as the weakening structure of welfare state. More than 90 per cent of our working population is in the informal sector which implies low wages for endless working hours, lack of social security and welfare benefits. Needless to say, this sector has faced the socio-economic jolt of the pandemic the foremost.

Industry body CII on 27 July 2020 had pointed out the uncertainty looming due to localised lockdowns in States is preventing companies from planning beyond a few weeks, thus adversely affecting the operations. CII suggested that based on the progression of infection, preparing a standardised set of predictable response could reduce this uncertainty and help in boosting investment and confidence in the industry.

Public spending should prioritise medical facilities including personnel, and equipment, and avoid trade restrictions on medical and health products. Furthermore, tax and spending measures should lift potential output, promote participatory growth, and protect the vulnerable. Digital payments systems can be used for delivery of help. Where this is not feasible, local governments and NGOs could be used to provide in kind food and medicine.

The increased deficit should not be a matter of concern as future growth would make it manageable. This is particularly likely if the measures raise the future growth potential, through investments in health, education, and high-return infrastructure projects, as well as research. This would counter the slow productivity growth caused by inadequate

human capital accumulation. Repairing balance sheets and disposing of distressed debt is necessary to encourage investment in physical capital. Furthermore, the opportunity can be taken to promote investment in new growth areas including e-commerce, digitalization of the economy and green projects. Another promising area would be medicine and biotechnology. Educational and vocational programs need to cater to the new jobs that are likely to be in high demand (emergency first responders, nurses, and lab technicians and digital literacy).

Atmanirbhar Bharat package announced by the Government after six weeks of lockdown attracted mixed response. While the package does attempt to focus on land, labour, liquidity, and laws to revive the slowing economy, direct fund support and subsidies/tax waivers would benefit a much larger segment in the industry, especially the small businesses and the salaried persons dependent on them.

As discussed earlier, the MSME sector requires liquidity to keep the operations going. In this direction, the Government could extend its well intentioned EPF contribution support to cover more enterprises for a longer duration to ensure that more liquidity is available in the hands of the organisations. Further, the sector could be boosted through easy and low-interest loans, GST exemptions, swifter refunds, and promotion of consumption expenditure especially in rural and middle class India.

Lastly, despite the fact that the fiscal condition has become quite precarious post the pandemic, it is imperative to strengthen our public healthcare system. The pandemic is the living proof that the status of the public healthcare system can significantly impact a country's economy.

In this direction, a recommendation would be the introduction of hypothecated tax (or earmarked tax) for raising and channeling resources for larger health expenditure. The revenue generated from hypothecated tax can only be spent on designated programmes, unlike the revenue from a general tax that can be used for any item of public expenditure. Thus, targeted public expenditure is made possible as public is assured of how their money, paid as taxes, is being utilized for public welfare. By introducing strict accountability as well as prudent financial planning and management, these taxes can be accommodated in the Indian economy. Two notable examples of this category of taxation in the Indian economy are the Education cess and the Swachh Bharat cess.

In similar lines, two hypothecated taxes for raising additional revenue for health care in India- the Fat tax and the Sin tax are recommended. Fat tax is an additional tax burden on junk food, introduced primarily to reduce obesity and cardio vascular diseases, by making unhealthy food financially unattractive to consume. Kerala is the first and the only state in India to introduce in July 2016 a fat tax of 14.5 per cent on junk foods served at branded restaurants. Sin tax is an additional tax burden on alcohol and tobacco products.

The Centre must continue to act swiftly and boldly to tackle the socio-economic concerns highlighted by the contracting domestic production and the spiraling growth projections. Further, the states must be kept in confidence, the dignity of cooperative federalism being maintained, especially with respect to the pending GST compensation. Above all, the economic sustainability of the unorganised sector along with the strengthening of health and social protection systems must be prioritised to mitigate the devastation of the pandemic on socio-economic advancements achieved by the country in the last few decades.
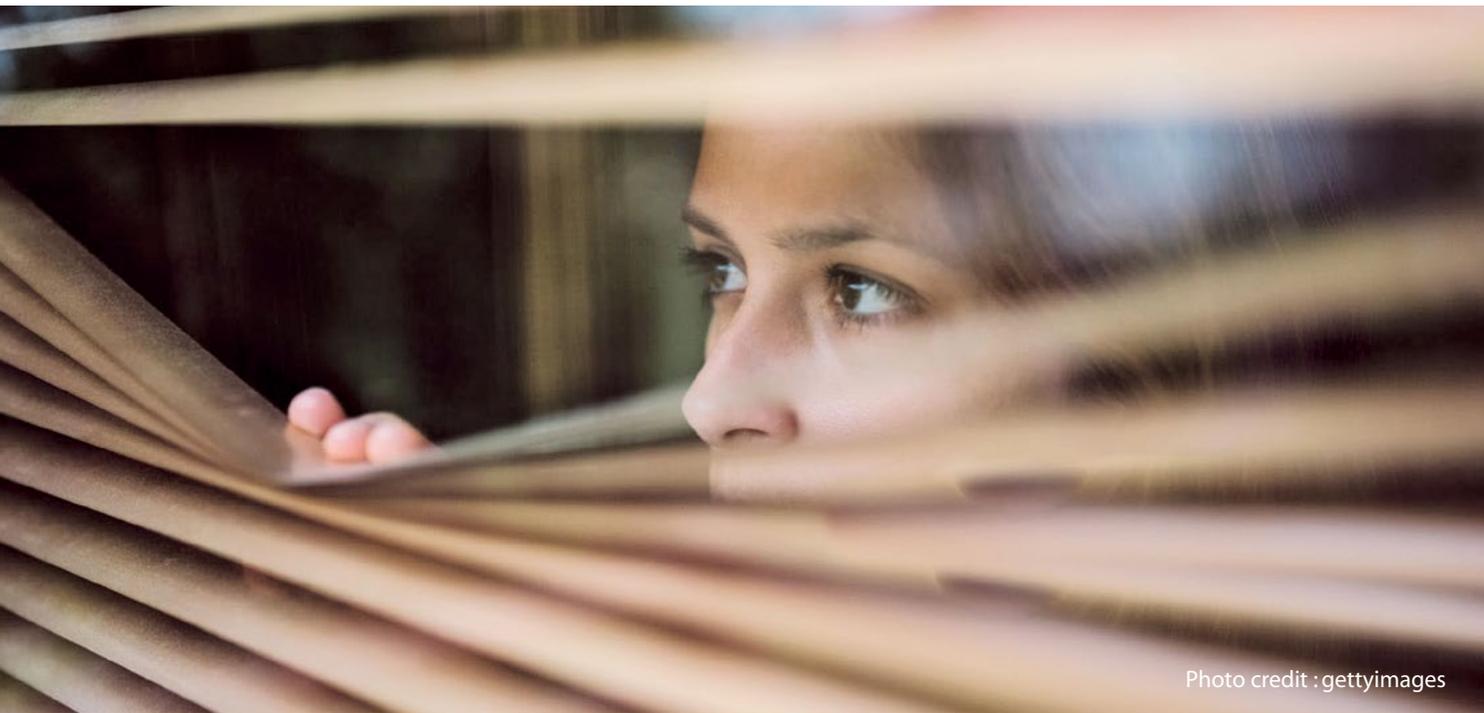
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Mental Health And COVID-19: An Interim Report From India

Introduction

To appreciate the mental health crisis that India faces in relation to COVID-19, one has to begin with recognising the very serious situation which existed even before the pandemic. The Government's National Mental Health Survey reported that about 10% of adults met diagnostic criteria for a mental health condition (ranging from mood and anxiety disorders, to trauma related mental health problems, to alcohol and other substance use conditions, to severe mental disorders)[1].

The Global Burden of Disease study estimated that nearly 200 million people in India had experienced a mental disorder, nearly half of whom suffered from depressive or anxiety disorders[2]. India accounted for over a third of the female suicides globally, and nearly a fourth of all male suicides[3] and suicide was the leading cause of death in young Indians[4]. The Government spent very little on mental healthcare (estimated at less than 1% of the health budget), and this expenditure was almost entirely on doctors, drugs and hospitals in urban areas. There was little community oriented mental health care anywhere in the country. Not surprisingly, between 70 to 92% of affected individuals had received no care from any source of any kind, for their mental health condition[1].

The Impact of COVID-19 on Mental Health

One can consider the impact of the pandemic on mental health in two phases.

The first is the acute phase which coincided with the lockdown and the period when the epidemic surged throughout the country. The second phase will unfold in the months ahead as the virus is contained, but the economic fall-out of the pandemic begins to bite deeper.

Right now, in the midst of the acute phase, people are terrified of the virus, of dying, or of loved ones contracting this disease. They are also terrified of being quarantined, maintaining physical distancing, being isolated, and breaking the constantly changing rules. For millions of people, these fears only add to the already daunting apprehensions about their livelihoods. These are not abstract anxieties; these are real, everyday worries. And if one considers all of these factors, and adds to them the increase in domestic violence, the disruption of public transportation, access to routine health-services and the shortage of medical supplies; it seems almost normative that people are going to be very distressed during this period.

Indeed, there is already evidence in support of this distress. Internet based surveys conducted between March - May 2020 show high rates of depression and anxiety in the general population. The 'FEEL-COVID' survey conducted in February - March 2020 with 1,106 people across 64 cities[5] reported that a third of respondents had significant 'psychological impact' because of COVID-19.

Another survey in March, which had 662 responses from 25 States[6], reported that 72% of participants experienced worries about themselves and their loved ones, and approximately 40% were 'paranoid' about contracting COVID-19 or fearful when hearing of known persons being infected; 12.5% had difficulty sleeping because of COVID-19 related worries.

A third survey – conducted later on in the lockdown with 873 adults – showed a prevalence of 18.6% and 25.7% for depression and anxiety respectively[7].

Regional surveys and investigations with specific sub-populations also show similar findings. In a study conducted in West Bengal[8], 71.8% of respondents experienced worry, 52.1% were preoccupied with fears of contracting COVID-19, 21.1% had repeated thoughts of getting tested even though they had no symptoms, and between 24 and 37% experienced depressive feelings, insomnia, or irritability. A survey of 152 doctors revealed that 34.9% and 39.5% were depressed and anxious respectively[9], and one study reported higher anxiety among sexual minority groups[10].

A survey of nearly 6,000 urban youth aged 18-32 years[11] reported that 65% felt lonely during the lockdown, and 37% felt that their mental health had been 'strongly impacted'. A study by CRY[12] with 1,102 parents and primary caregivers from 23 States showed that over 50% of children had experienced agitation and anxiety during the lockdown, and 37% had their 'mental well-being and happiness' affected.

None of these studies are representative because they focused primarily on English speaking urban adults who had access to the internet. Nevertheless, the rates of anxiety and depression reported are uniformly high – up to 20% higher than previously reported rates in the community[1]. These symptoms may have even increased over time; a study examining over 17,000 responses from 211 districts, showed a 166% increase in complaints of anxiety from April to June 2020[13].

The lockdown has also exacerbated problems for those with substance use disorders. The sudden closure of all liquor shops in the country resulted in withdrawal symptoms in people with alcohol dependence, leading to delirium tremens and seizures[14]. Many persons - distressed by their craving for alcohol, consumed poisonous substances such as hand sanitisers as substitutes, and died[15].

Persons addicted to nicotine, opioids and other drugs have also suffered from withdrawal, owing to the lockdown inflating cigarette prices, closing down pan shops, or cutting off drug supplies[16] [17]. Many substance users struggled to seek help for their problems, as de-addiction centres fthat were ocused on caring for existing patients, or were constrained by social distancing norms, either refused to admit new persons, or closed down[18] [19].

A study that examined suicides in the first two lockdown phases (24 March to 3 May 2020) found that there were nearly 50% more suicides during this period when compared to the same period in 2019[20]. Our own analysis of media reports of COVID-19 suicide cases from 1 February to 31 May 2020 identified 291 suicides, with increases in numbers every month[21]. A third of these suicides were attributable to economic hardships following the lockdown; other major contributing factors were: fear of the virus; isolation as a result of home and institutional quarantine; desperation to be with loved ones or to return home; and craving for alcohol[21].

Most Affected Groups

In general, reports indicate that young people, frontline workers, and persons with a history of mental health conditions were more likely to experience distress[5 6 8 9 11 21]. This is not surprising: 27 million young people lost their jobs in April 2020 alone[22], and 32 crore students have been affected by the closing of educational institutions, and the postponement of exams[23]. For persons with pre-existing mental health conditions all the anxieties described earlier could have been overwhelming[24]. Problems may also have worsened for individuals who were unable to seek care because of the disruption of mental health services, or those uncomfortable with e-care[25]. There are also reports of persons reducing doses of prescribed medication as they could not travel to clinics, which could have led to relapse[26]. Frontline workers are reportedly burdened by over-work, and anxious about contracting the virus[9 21 27].

Studies report more women suffering from anxiety and depression[5 7], but more men dying by suicide[20 21]. Women, many of whom are employed in the informal sector, are at greater risk for poverty, and have faced the brunt of increased household responsibilities during the lockdown[28]. Several have been subjected to increased violence at home, with no means of escape from their abusers[29]. Many of the men had lost their livelihood and often being the breadwinners in their households, were driven to suicide as a result of experiencing guilt and helplessness for not being able to provide for their families[21].

Although there are no studies specifically with migrant workers, panic reactions have been observed in the millions who lost their livelihood, and made desperate attempts to return to their rural homes[30]. Daily wage labourers have also been affected; the Manas Foundation, which reached out to 1,200 auto drivers, found that 75% were anxious about their work and finances[31]. Media reports on COVID-19 did not help; in one survey, 44.7% of respondents reported the tendency to 'freak out' because of social media posts[6], and in another, over 25% reported feeling depressed or worried after reading information on WhatsApp or Facebook[8].

Responding to the Crisis

There has been flourishing of initiatives to address this rising tide of mental health problems, most notably through telemedicine platforms. Though these suffer from the barriers of digital literacy and adequate internet connectivity that apply to large swathes of India's people, one welcome aspect of this development is the recognition of the possibility of remote delivery and the value of psychological therapies. These have often been ignored in mental health care and, at best, playing a poor cousin to medication options.

Media reports of calls to mental health helplines reveal the extent to which people are seeking help through this medium. The Brihanmumbai Municipal Corporation and Mpower helpline, for example, received about 750 calls a day, and a total of 45,000 calls in just 2 months[32]. 52% of these calls were regarding the uncertainty post-lockdown, 22% were about 'isolation and adjustment issues', 11% were about depression, 5% about sleep difficulties, and 4% about the worsening of existing mental health concerns.

Online platforms have also seen a surge in persons seeking help, for a range of issues such as anxiety, loneliness, and low productivity following the lockdown. Lybate, an e-health platform has reported a 180% increase in mental health consultations from March to June 2020[33]. Practo, another platform, has seen a 200% increase in tele-psychiatry consultations, with the largest number of consultations coming from people between 20 and 30 years of age[33]. One of the primary initiatives of the Government – announced as early as 25 March 2020, was a telemedicine system whereby persons with mental illness can be provided with electronic medical prescriptions. However, this has not been very effective for poor persons in rural

Photo-Credit- Williams DanielNationalGeographic

areas, or for obtaining medicines that cannot be sold over the counter without a hard copy[26].

On 29 March 2020, the Health Ministry, in collaboration with NIMHANS, Bangalore, launched a toll-free helpline number to address mental health issues of people during lockdown[34]. On 4 July 2020, they released a resource package that details guidelines for management of mental health problems, for use in primary and specialised health settings. This document comprehensively describes issues faced by specific populations (for example children and quarantined individuals) and advocates strategies for management. Other resources on mental health, for example; on concerns of health workers, management of depression, and psycho-social issues among migrants, have also been developed[35]. The University Grants Commission has directed all educational institutions to set up mental health helplines to help students[36]. These helplines are expected to address any kind of mental health and psycho-social concerns of student community during and after COVID-19.

At the State level, the response of the Kerala government has been particularly noteworthy[37]. Shortly after the announcement of COVID-19 being a pandemic, the government constituted a 'Psychological Support Team' to develop strategies to manage mental health problems. The Government integrated efforts by several sectors, including the District Mental Health Programme (DMHP), the local panchayat, and DISHA (a helpline set up in 2013 under the Department of Health and Family Welfare). Efforts taken by this initiative included caring for persons in isolation by providing them with counselling; alleviating their boredom and loneliness with internet access, books and newspapers, and ensuring follow up; offering a

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24×7 helpline to answer queries related to the pandemic for alleviating fears and concerns. The State Government also set up digital platforms such as the *Kerala Online Health Training* You Tube portal and the *GoK Direct app*, to provide accurate information about the virus; ensured tele-health consultations for persons with substance abuse disorders, and arranged in-patient care for those with severe symptoms.

The Madhya Pradesh Government revived the *Happiness Department* in hospitals, whereby 'light entertainment, music and films' will be provided to COVID-19 patients[38]. Some State Government de-addiction centres – for example, in Kerala and Punjab - have stepped up to handle the increased case load.

The Punjab Government, together with the private sector, has successfully enrolled and treated over 500,000 patients in the Outpatient Opioid Assisted Treatment (OOAT) and de-addiction centres[39]. To overcome curfew problems, this Government started a system where a registered patient could take home a week's dose so that they are not deprived of treatment during the lockdown.

Several Government institutions and hospitals, for example, in Maharashtra, and Assam, have set up mental health helplines[40]. Some have reached out to migrant labourers in camps to provide counselling[41 42].

Several NGOs, private hospitals, and universities have set up helplines and e-counselling; for example the Neptune Foundation, Trijog, Mastermind Foundation, Samaritans, Jamia Millia Islamia, Ya_All, and Fortis[43]. Some of these initiatives specifically reach out to vulnerable groups, like students or sexual minorities. NGOs such as CRY, The Banyan and Sangath have hosted webinars on mental health, or are providing free, tele-counselling services.

The COVID-AV platform, involving a coalition of organisations in Goa, is reaching out to people

from Jammu & Kashmir to Kerala. Sangath's tele-psychiatry *IMPACT India* project offers a model that allows patients to access specialist mental health care while following physical distancing. The *It's OK to Talk* initiative engages with young people through social media. Other digital platforms include the *YourDOST* app which connects persons with experts. There is *InnerHour* which offers a free program titled 'COVID-19: Self-Care Guide'.

Looking Ahead: Threats and Opportunities

As we look ahead beyond the acute phase of the pandemic, the world will need to address an economic recession far greater than anything we have encountered before.

A rise in the burden of clinically significant mental health problems is expected as an impact of this economic recession, the widening of inequalities in countries, the continuing uncertainties about future waves of the epidemic and the physical distancing policies. This would not be surprising, given the strong association between poverty, inequality and poor mental health[44]. "Deaths of despair" have been documented as the cause for the increased mortality and reduction in life expectancy in working-age Americans following the economic recession in 2008[45]. Tracing the source of these deaths ultimately to a deeply unfair economic system, the authors point out that these deaths were not so much due to material hardship, as they were due to the loss of hope from lack of employment, and rising inequality. Suicide and substance use related mortality accounted for most of these deaths. India shares the ills of the US society, from its profound social and economic inequalities, to its weak social security net and fragmented health care systems. In addition, it is home to the largest number of poor people in the world, already enfeebled by hunger and myriad diseases of poverty. Mental health care systems will be ill-equipped to deal

with this surge, not only because of the paucity of skilled providers, but also because of the narrow bio-medical models of illness which dominate mental health care.

The impressive body of evidence generated by community oriented practitioners in India[46] has led to a range of innovative strategies aimed at addressing the structural barriers to the scaling up of psycho-social therapies[47] [48] [49]. Notably, the demonstration that pared down 'elements' of complex psychological treatments packages can be just as effective as standardised treatment protocols (for e.g. behavioural activation for depression, compared with cognitive behaviour treatments); that providers can be trained to learn. A library of such 'elements' targeting specific types of mental health experiences (for example, mood problems, anxiety problems, trauma related problems) using simple decision making algorithms to 'match' patients' problems with specific treatments elements can be used. One that does not require a formal diagnosis to trigger care, thereby, greatly simplifying the dissemination of these effective treatments. These treatment elements and trans-diagnostic protocols can thus, be effectively delivered by non-specialist "therapists"; such as community health workers.

These delivery models are highly acceptable to consumers, show recovery rates comparable to specialist care models, and are excellent value for money[50]. More recent innovations seeking to scale up these approaches demonstrate the acceptability and effectiveness of digital training in the delivery of psychological treatments and of peer supervision for quality assurance[51]. This range of innovations, when combined and scaled up, can transform access to one of the most effective interventions in medicine. This is exactly the goal of the EMPOWER program, an initiative of Sangath, in partnership with Harvard Medical School[52], which is seeking to scale up evidence based psychological therapies. Over the coming years,

Sangath, in partnership with state governments, will digitise the curriculum of crisis counselling with a brief behavioural activation treatment for depression, its competency assessments, and the supervision and quality assurance protocols.

Beyond specific programs, there is an urgent need for a national, whole-of-government, response plans across relevant sectors. For example, when looking at education, we need to consider how to address the mental health needs of children and young people, while ensuring that their learning continues in the absence of schools being open. We need strategies to proactively respond to risk factors that are associated with mental health that we know are on the rise; for example, domestic violence. We need to support community action, to build social cohesion and solidarity; and we need to be intentional and sensitive in how we communicate about the pandemic. Additionally, we need to be aware that some groups in the population are particularly vulnerable and need additional support and resources, for example, people with existing mental health problems, and younger people.

This is a timely moment for all who are concerned with mental health. Mental health professionals as well as civil society advocates need to unite together with one message. The COVID-19 response must address mental health alongside containment of the epidemic itself, otherwise we will see an epic human tragedy unfold in the months and years ahead.

This is also a historic opportunity for us to completely re-imagine what mental healthcare means. To acknowledge and embrace the plural ways in which mental health problems are experienced, we must go beyond the narrow, disease-based models of mental healthcare and embrace the diversity and the pluralism of mental health in our communities.

Impact of COVID-19 on the Learning Outcomes and Mental Health of Students in India

The COVID-19 pandemic is one of the biggest public health crisis witnessed in the modern era. The speed of the virus's spread and the closure of universities, colleges and schools; have impacted more than 90 per cent of the world's students. According to a Human Rights Watch report released in April 2020, more than 1.5 billion students were out of school due to school shutdowns in 192 countries.[1] In India, the nationwide lockdown has compelled more than 300 million students to stay at home. Though many educational institutions have started online classes, a vast number of children and young adults have been left out in the cold. Undoubtedly, extended school closures will cause major interruption in students' learning, and may also have long-term consequences for the affected students.

Most educational institutions have rapidly changed the way they function, in response to this pandemic. Several schools have tried to recreate the school setting online, by using online meeting platforms like Zoom or Microsoft Teams. However, this sudden and unplanned shift to online learning methods has its own set of problems. The virtual classrooms have brought to the fore the stark reality of social inequalities in terms of resource availability. A large proportion of students do not have access to stable and fast internet connection, computer or smart phones, or even reliable electricity connection. The digital divide has created a huge obstacle for students from underprivileged families, or for those who live in remote areas. Some estimates indicate that only 42 per cent of households in urban India have internet access, while the same figure is only 15 per cent in the rural parts of India. The unconnected students will fall behind their connected peers as more schools and colleges embrace the e-learning mode. The contagion has made us aware of the increasing structural imbalances in our school education system. This imbalance has several manifestations - for example, the rural-urban divide, the household income inequalities, and the gender divide.

The recent migration of millions of labourers from the large urban centres has added another dimension to the problem. Government of India, the state governments and other institutions have to find a mechanism to ensure that education of the children of these migrant workers aren't disrupted due to the mass migration of the workers' families. As the workers have returned to their villages, the children in these families are finding it increasingly difficult to continue their education, because of infrastructure bottlenecks like poor internet connection. In West Bengal and Bihar states which saw a large number of migrant returnees, only 7-8 per cent of rural households have internet access.[2]

During a recent workshop conducted by the Directorate of Education, Government of Goa, in collaboration with Sangath and a few other institutions, some of the main concerns expressed by parents of school-going children were as follows:-

Difficulty in monitoring the online activities of their children: Many parents are not familiar with technology, and they find it difficult to monitor the child's academic progress, or other online activities. Parents are also at their wit's end trying to keep track of children's online classes, especially if they have two or three children, as most classes are held around the same time.

Behavioural changes: The daily routine of children has suddenly transformed due to the closure of schools. Many children are not able to manage time. Children now require more personal attention, which the working parents are unable to provide. Many parents believe that the increased web surfing time on laptops and smartphones has brought unwelcome distractions for the children, resulting in reduced concentration in studies. The parents also worry that the increased screen-time, due to the online learning mode can adversely impact the children's health, especially their eyesight.

Increase in financial burden: A significant percentage of parents have lost their jobs, or have reduced take-home salaries due to the contagion. However, their children are expressing the need for smartphones, laptops or broadband connection to attend the online classes. This has exacerbated the financial crisis within the affected families.

Though technology is a great enabler, technology platforms can not replace the wholesome ecosystem of schools and colleges. The rapid shift to the virtual learning mode may help partially complete the syllabus, or to prepare students for a few exams, but this sudden transition has certainly resulted in a negative impact on students' mental and physical health. Research shows that students don't feel motivated to complete their tasks, when they are not surrounded by their friends and peers. The online learning method also ignores the different learning pace of students. Students who were already the most vulnerable to falling behind, are facing greater hurdles to keep pace.

> **9.8 million teenagers in the 13-17 years age group suffered from depression and other mental health disorders**

The changed situation is a big challenge for educators, too. Though most teachers have risen to this challenge with fortitude, and are trying to get accustomed to the digital learning environment, many teachers are not adequately trained to teach online. New data from UNESCO's teacher task force show that 2.7 million Indian teachers impacted by the pandemic, are untrained to handle the "new normal".[3] Moreover, many teachers have lost jobs, or currently face uncertainties regarding salary payments. Teachers also find it difficult to provide individual feedback to students during virtual sessions.

Students' Mental Health During the Pandemic

All pandemics have an associated mental health pandemic. Even before this pandemic befell our nation, India had one of the highest suicide rates in the world, in the 15-29 years age group. The National Mental Health Survey 2015-16, conducted by the National Institute of Mental Health & Neurosciences (NIMHANS), Bengaluru, had revealed that 9.8 million teenagers in the 13-17 years age group suffered from depression and other mental health disorders.

Due to the widespread panic, anxiety, lockdown-related difficulties and social isolation during this contagion, students and young adults are facing a harrowing time. Though research data on the pandemic's mental health implications for children is scarce in the Indian context, studies done in other countries demonstrate that there is an urgent need for psychological support for school going children.

A survey conducted in UK indicate that more than 75 per cent of the children believe that this pandemic has made their mental health condition worse.[4] Moreover, 26 per cent of the students in UK, who were accessing mental health services before the shutdown, had stated that they were unable to access mental health services now.[5]

For a child, or a young adult, the pandemic has brought a completely new situation. Difficulties in meeting friends, inability to attend school, limited opportunities to play, disruption in social connections, the fear of becoming infected, or hearing about the illness of a family member - all these situations often lead to heightened levels of anxiety among children.

In a recent article published in the Lancet Child & Adolescent Health, Amy Orben and her co-authors point out that the physical distancing measures followed globally to contain the COVID-19 virus are radically reducing adolescents' opportunities to engage in face-to-face social contact outside their household, and this social deprivation among adolescents may have far-reaching consequences for them.[6] The Lancet article discusses evidence to suggest that human adolescents are hyper sensitive to social stimuli and to the negative effects of social exclusion.

The lockdown and social isolation had taken a heavy toll on the mental health of college and university students, too. An assessment of 45 students, conducted by University of Delhi's online mental health counsellors has shown that a majority of them are suffering from generalised anxiety disorder, restlessness and a sense of hopelessness about their future.[7] Many college students confined to their homes, PG accommodation or hostel rooms, have reported depressive mood, sleeplessness, interpersonal problems, compulsive behaviours or tendency to engage in self-injury.

A similar scenario emerges from the free mental health counselling sessions on the COVIDAV mental health platform jointly built by Sangath, Psychiatric Society of Goa, Directorate of Health Services (Government of Goa) and other partner institutions. There are early indications that we may face a full-blown mental health crisis post-COVID-19. The anxieties about what will happen post-lockdown, depression, isolation and adjustment issues, incomplete exams, uncertainties about the new exam dates, and exacerbation of previous mental health concerns have created an alarming situation, which may linger even after the spread of the virus is stopped. Often young callers have called the helpline numbers, but disconnected the call before speaking to a counsellor, which reinforces the stigma around mental health in our country.

There is a strong economic case for investing in services and projects purported to support mental health of students. Research evidence shows that students with mental health problems, such as depression have a higher likelihood of dropping out of college. The mental health related risks can be significantly decreased when students receive timely support, including online mental health counselling and other resources.

COVID-19 Crisis and Students with Disabilities

Students with disabilities face other significant barriers to education, which often get overlooked when online-based approaches are being adopted during the pandemic.

Given the fact that a staggering 75 per cent of Indian children with disabilities do not attend schools, these children with special needs are already excluded from the mainstream educational discourse.[8] Disabled students require more time and resources to actively participate in learning. They not only require internet access, but also specially designed materials, equipment and support. Students with special needs also suffered in additional ways during the school shutdown. They have lost access to school meals and playtime with their friends, which are important for their development and learning. These children are particularly disposed to feeling confined, when

they don't have adequate social exposure. This leads to many emotional problems in these children. During the pandemic, parents have to single-handedly care for the heightened emotional states of these children, since the special educators and schools are not able to share that responsibility now.

The pandemic has exacted a higher toll on special children by throwing them off their routine. These children perform better when they have structured schedules and learning environments. The Government and schools will have to travel the extra mile, to ensure that children with disabilities get quality education according to their specific needs, for adapted and individualised learning.

The special educators can play an immensely important role in implementing Individualised Education Plan (IEP) during the COVID-19 times. Deploying e-learning methods can assist special educators to reach many children simultaneously.

During the pandemic, Directorate of Education (Government of Goa) has partnered with Sangath and a few other NGOs in Goa to train more than 350 special educators, and master trainers for capacity-building of special educators in terms of technological competence and mental health counselling capabilities.

Recently, CBSE has released guidelines, advising several measures like flexible scheduling and deadlines, assistive technology, sign language options in all forms of the learning material, and necessary replacements to print medium like using audio, or other

formats in instruction. It is heartening to note that the central and several state governments are partnering with schools, NGOs and other institutions to attend to the educational and mental health needs of the children with disabilities.

However, much more effort is required to provide special support and uninterrupted access to education to these children.

An Unprecedented Opportunity to Introspect

While this pandemic has brought insurmountable difficulties for humanity, it has also given us a chance to introspect and innovate.

The pandemic has fast-tracked attention to the mental health crisis in India, especially among the children and young adults. We need to organise our schools and colleges in such a way that the mental health issues of students are understood with deep empathy. Each student should feel equally included irrespective of socio-economic class, gender, or disability. Moreover, while the sudden and massive shift to remote learning during the pandemic is a transformative moment, we have to bear in mind that students from under-resourced communities, or students with disabilities may need more options in low-cost, low-tech or no-tech learning solutions.

Though Ministry of Education had launched digital learning platforms like PM eVidya program and DIKSHA, these online platforms will have limited appeal for students who

> **The special educators can play an immensely important role in implementing Individualised Education Plan (IEP) during the COVID-19 times**

do not have access to computers, smart phones or fast internet. Both the central and state governments need to ensure that the children in low-income families get access to computers or smart phones as well as good internet connectivity, so that they are not left behind.

The budget allocation for mental health care needs of children and the youth needs to be substantially increased. Only Rs. 50 crores were allocated to NMHP (National Mental Health Programme) in FY 2017-18, and this was further reduced to Rs. 40 crores in FY 2018-19. The actual spending was only about Rs. 5 crores during these years. The 2020 Union Budget did not enhance the allocation for NMHP. In India, the budgetary allocation for mental health was an abysmal 0.05% of the total healthcare budget during the last few years, which is much lower than the average spending in many low-income countries. In developed economies, the average allocation to mental health is at least 5% of the total healthcare budget. The conservative annual estimated expenditure to implement the Mental Healthcare Act 2017 would be Rs. 940 billion, according to a study by the *Indian Journal of Psychiatry*.[9] The actual spending is a very small fraction of this required amount.

In order to assure the provision of mental health services for the children and the youth, Government of India needs to ramp up the efforts to implement the Mental Healthcare Act of 2017. There needs to be a significant investment push, and the efforts should include incentivising companies to invest or donate a portion of their CSR funds for mental health programmes and projects. The re-named Ministry of Education in the Indian Government should also ensure adequate financial allocation in education budgets for meeting the learning needs of children with disabilities.

The COVID-19 pandemic has dramatically exposed the fault lines in our nation's education and mental healthcare systems. However, if the governmental and private institutions consider this severe moment of truth as a catalyst for introspection and innovation, the fight against the virus can accelerate the emergence of new models for building and managing our educational as well as mental healthcare infrastructure.
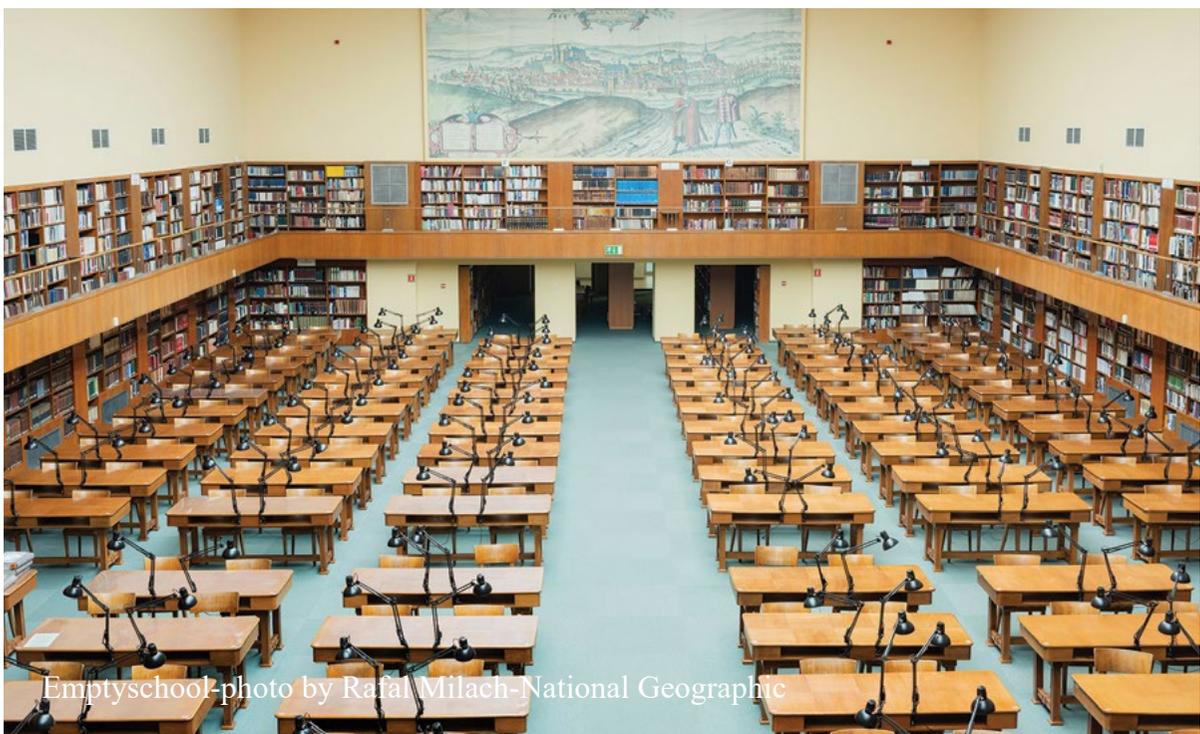
Emptyschool photo by Rafal Milach-National Geographic

COVID-19 and Health Risks Associated with Substance Abuse

Introduction

More than 35 million people around the world now suffer from drug addiction, according to the latest annual report on the scourge, from the UN Office on Drugs and Crime (UNODC), released this year, which also analyses the far-reaching impact of the coronavirus pandemic on global drug markets[1].

An epidemic, Coronavirus spread from China to the rest of the world in late 2019, resulting in a global pandemic (COVID-19 pandemic). Since January 2020, many restrictions have been imposed by different governments to face the public health threat, which also impacted the usual patterns of drug abuse throughout the world. The temporary border closure affected the usual illicit drug route of shipping from country to country, resulting in scarcity of classic street drugs. Moreover, restrictive measures internationally adopted by several countries made necessary to close all the usual recreational settings in which stimulants drugs are commonly abused. Furthermore, the consequent social isolation and the likely limited access to detoxification centres caused additional psychological distress, pushing drug addicts toward alternative psychotropic drugs, possibly through illegal online marketplaces[2].

The social and economic restrictions due to the coronavirus pandemic, have already seriously impacted health and social fields. COVID-19 outbreak has led to the implementation of social distancing to contain the spread of the disease, changing people's lifestyle. People have been going through a moment of anxiety and

fear for their health and their jobs, and they are forced to live an unfamiliar lifestyle, deprived of relationships. Furthermore, the condition of people with psychological troubles may have worsened during the pandemic, as a result of the unconsciously mirroring of others feelings[3]. This peculiar situation may have pushed more people toward a deviant behaviour linked to licit or illicit substance use, and it may have been a good opportunity for drug dealers to attract new customers.

However, global issues have not favoured the usual trade business. Indeed, social distancing has substantially reduced drug trafficking on the streets, pushing consumers toward illegal markets on the dark web, or through messaging applications[4]. Furthermore, the paucity of classic drugs, together with the impossibility to go out to look for those, might have induced addicts to misuse psychoactive prescription drugs such as benzodiazepines[5]. In this concern, although there is limited scientific evidence. The impact of the COVID-19 pandemic could lead to substantial modifications in substance use patterns, and an increased risk of substitution, adulteration, contamination, and dilution with a potentially harmful substance. As such, reports from forensic science and toxicology laboratories are crucial for the early detection, and response to such events.[6] Moreover, in this period of home confinement, users might no longer be looking for "socialising" substances to be used in recreational settings, but for psychotropic drugs to be consumed in solitude.

Isolation and loneliness can have negative consequences, on physical and mental well-being. The feeling of isolation can lead to anxiety and anger, and even sleep disorders, depression, and post-traumatic stress disorders; which may be underestimated due to the lack of specific screening tools.[7] Moreover, psychiatric

assistance from health professionals is not assured, due to the temporary monopolisation of psychiatric facilities for COVID-19 treatment[8]. In addition to drug addicts using prescription sedatives available at home, some may have shifted to narcotics, such as new synthetic opioids, or designer benzodiazepines, available online. Indeed, these two classes of new psychoactive substances showed the highest consumption increase in 2019[9].

COVID-19 Health Risks Associated to Psychotropic Drug Use

The National Institute on Drug Abuse in the US, and the European Monitoring Centre for Drugs and Drug Addiction, in Europe, first sounded the alarm; raising concerns about the vulnerability of people with substance use disorders to COVID-19, especially because of opiates (e.g. heroin), synthetic opioids, and methamphetamine effects on the respiratory system and pulmonary health.[10] Co-morbidities, including cardiovascular and other respiratory diseases, have proven to worsen prognosis in patients with other coronaviruses, affecting the respiratory system, such as SARS-CoV and MERS-CoV.[11]

COVID-19 affects the respiratory tract along with having a high mortality rate among elderlies and people with co-morbidities; such as diabetes, cancer, and breathing difficulties. Given the high prevalence of chronic diseases among drug users, many may have been at risk of respiratory distress and death if infected with COVID-19. It is also worth mentioning that smoking heroin, or crack cocaine addicts may undergo asthma and chronic obstructive pulmonary disease (COPD)[12]. Moreover, people using high doses of prescription opioids, or presenting opioid use disorder experience additional challenges for their respiratory health. Indeed, opioids act on the central

nervous system with respiratory-depressant effects, and high doses may cause severe hypoxemia, which may lead to irreversible brain damage.

Chronic respiratory diseases are already known to increase overdose mortality in opioid users, and reduced lung function due to COVID-19, could similarly threaten this population. There is also a high incidence of cardiovascular diseases among opiates, opioids, and cocaine users[13].

Tobacco Use and COVID-19

Tobacco is one of the biggest global health concerns of this century with a significant contribution to the increasing burden of cancers, chronic diseases and associated mortality. According to World Health Organisation (WHO), globally tobacco kills nearly 8 million people each year, of which around 1.2 million are non-smokers exposed to second-hand smoke.

India has over 26 crore tobacco users, and tobacco kills over 12 lakh Indians each year, as per Global Adult Tobacco Survey (GATS) 2016-17, Government of India. Among adults in India aged 15 and above, 29 per cent use any form of tobacco, including 42 per cent of men and 14 per cent of women. 4 per cent of Indian adults smoke cigarettes, 8 per cent smoke bidis, and 21 per cent use smokeless tobacco products. India is the oral cancer capital of the world because of rampant habit of tobacco chewing. Over 65 per cent of cancer cases in India are attributed to tobacco use. 30 per cent of cancers that arise in head and neck region are caused due to non-smoking tobacco used in India.

In fact, Global Youth Tobacco Survey (GYTS) 2009 estimated that daily about 5,500 youth

and children as young as 8 years old, initiate tobacco use. Tobacco-use also imposes enormous economic costs at the country level. The annual economic costs from all tobacco products was estimated at INR 177,341 crores in 2017-18, amounting to 1 per cent of India's GDP.

Tobacco use is a major risk factor for the four main Non-communicable Diseases (NCDs) — cardiovascular disease, cancer, chronic lung disease and diabetes, which puts people with these conditions at higher risk for developing severe illness when affected by COVID-19. NCDs are estimated to account for 63 per cent of all deaths in India, and these are expected to rise further.

Tobacco use is also a risk factor for infectious diseases - tuberculosis and lower respiratory infections - health burdens that afflict much of humanity. Tobacco smoke contains toxic chemicals which cause damages to the linings of the airways and the lungs. It weakens immunity of the patient to fight against the TB causing mycobacterium. More than 20 per cent of the global TB incidence may be attributed to smoking. The percentage of death is higher (38%) among TB patients associated with tobacco use. Both smoking and being exposed to second-hand smoke (other people's smoke) are significantly associated with TB infection, disease and mortality. As per studies conducted, the prevalence of TB is three times higher among ever-smokers, as compared to that of never smokers and mortality from TB is three to four times higher among ever-smokers, as compared to never smokers.

The COVID-19 pandemic evolved for conclusive evidence to have emerged on the impact of smoking on an individual's susceptibility to COVID-19 infection. However, there is overwhelming evidence that people who

smoke are at higher risk of getting lung and chest infections, which can be caused by other respiratory viruses (such as influenza) and also bacteria. This means that it is more likely that people who smoke have a higher risk of getting COVID-19, compared to people who don't smoke.

There is growing evidence to suggest that people who smoke, are likely to be more severely impacted by COVID-19 if they do become infected, because smoking damages the lungs so that they don't work as well. For example, lungs naturally produce mucus, but people who smoke have more and thicker mucus that is hard to clean out of the lungs. This mucus clogs the lungs and is prone to becoming infected. Smoking also affects the immune system, making it harder to fight infection. People who smoke are at higher risk of respiratory tract (including lung) infections, which puts them in most vulnerable group having higher risk of getting COVID-19. We do know that exposure to second-hand smoke also damages lungs and depresses the immune system, increasing susceptibility to chest and respiratory infections. It is very important that people who smoke don't do in presence of a non-smoker. People are indoors mostly these days and chances they might want to smoke in front of a family member, especially kids putting them at higher risk of getting COVID-19.

The Indian Government put out an advisory for smokers and smokeless tobacco users regarding their greater risk for COVID-19 susceptibility and complication. As stated in the advisory, COVID-19 attacks the lungs, meaning that behaviours that weaken the lungs put individuals at greater risk. The harmful impact of smoking on the lungs in general is already well-documented. Studies

from India and other countries are finding that tobacco use, whether smoked or chewed, can increase risk of exposure to COVID-19 and may contribute to worse outcomes if infected.

Tobacco use in all forms, whether smoking or chewing, is significantly associated with severe COVID-19 outcomes. A recent (Nov. 2020) review of the literature on COVID-19 severity and tobacco use to date, argues that *"nicotine exposure is linked to cardiopulmonary vulnerability to COVID-19, and tobacco use may be a risk factor not only for contracting the virus,"* but also for experiencing more adverse outcomes if infected. The current pandemic provides a teachable moment to break the cycle of nicotine addiction, and accelerate national tobacco control programs to achieve a tobacco-free world.
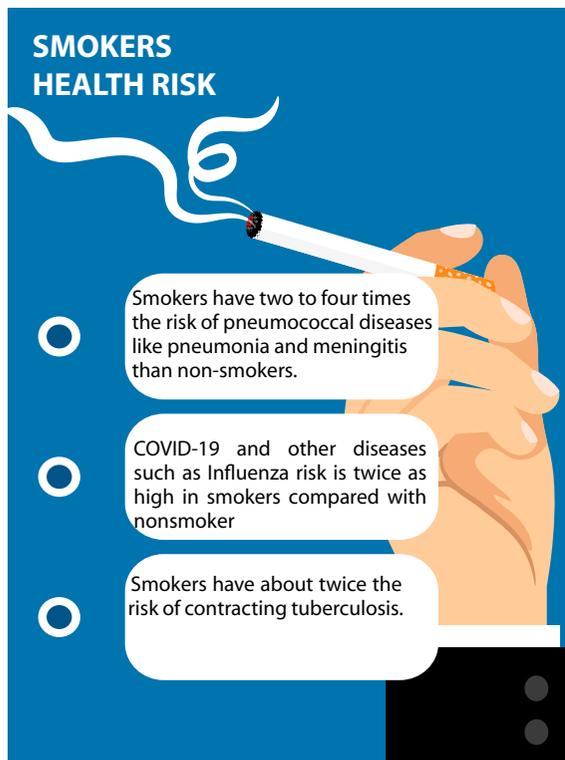
Besides being the second most populous country in the world with high urbanisation, India is also in the top three for tobacco production and consumption, with 80 per cent of the world's smokeless tobacco users. In one study, researchers focused on urbanisation, population density, and smoked and smokeless tobacco use in India, to understand the combined impact on the spread and recovery rate of COVID-19. Researchers found that tobacco use (smoked or smokeless) was associated with longer recovery rates from COVID-19 infection.

Smoking is a risk factor for progression of COVID-19, with smokers being much more likely to experience COVID-19 disease progression than never smokers.

Smoking harms the immune system and, therefore, the body's ability to fight infection. This impairment occurs in two different ways:

- The chemicals in tobacco smoke suppress the activity of different types of immune cells that are involved in general and targeted immune responses.
- The components in tobacco smoke also over-activate immune cells, which are recruited to combat the toxins that are inhaled and their effects. Over time, this pro-inflammatory effect can damage different tissues throughout the body, and result in a number of chronic diseases including various auto-immune diseases, cardiovascular disease, cancer, diabetes, and chronic obstructive pulmonary disease (COPD).

There is overwhelming evidence that people who smoke are at higher risk of contracting viral and bacterial respiratory infections:

SMOKERS HEALTH RISK

Smokers have two to four times the risk of pneumococcal diseases like pneumonia and meningitis than non-smokers.

COVID-19 and other diseases such as Influenza risk is twice as high in smokers compared with nonsmoker

Smokers have about twice the risk of contracting tuberculosis.

Smokeless tobacco (SLT) consumption is of particular concern in countries in South Asia with high population densities, as it facilitates exposure to COVID-19 within, or between communities by the act of public spitting. Spitting in public compromises the health of others. Saliva contains germs that can spread through the air, and be inhaled by others passing by, as well onto common surfaces that others may touch. Moreover, it is common for SLT users to gather in large groups outside tobacco shops, frequently touch their hands to their mouths, and share SLT products with one another, all of which can contribute to the spread of the COVID-19 virus.

Due to the COVID-19 pandemic, Ministry of Health & Family Welfare, Government of India issued directions to all Chief Secretaries of the State to prohibit the use and spitting of smokeless tobacco products in public places in order to prevent the spread of coronavirus. In view of the increasing danger of COVID-19 pandemic, the Indian Council of Medical Research (ICMR) also appealed to the people not to consume and spit smokeless tobacco in public places. The apex health research body said, "Chewing smokeless tobacco products (gutka, pan masala with tobacco, pan and other chewing tobacco products) and areca nut (supari) increases the production of saliva, followed by a very strong urge to spit. Spitting in public places could enhance the spread of the COVID-19 virus."

COVID-19 and Alcohol

Billions of people had their lives dramatically changed when the COVID-19 virus emerged in 2020. As we all know, the coronavirus illness is a highly contagious, and infectious disease, most often causing fever, fatigue, dry cough, muscle pain, and shortness of breath. What distinguishes this current pandemic from others is its very fast spread, and relatively high mortality. This was confirmed in mid-March 2020 when cases were recorded in 135 countries in all continents, roughly 3 months after the first cases had emerged. On 1 March

2020, mortality rates reached 3.6 per cent in China and 1.5 per cent outside of China.[14]

The pandemic situation is undoubtedly a crisis felt by huge numbers of people, leading to difficult psychological consequences. It takes considerable effort to re-adapt to an unknown and uncertain situation and how to deal with many unpleasant emotions, daily irritations, and the prospect of a threatened material existence to oneself and family.

Due to the well-known and documented effects of inhibiting the nervous system, alcohol and other psychoactive substances are used by many people seeking relief from unpleasant emotions, stress, anxiety, or depression[15]. This begs the question of whether the significant rises in alcohol sales, (including those by mail), seen in many countries; are due to the pandemic when compared to the same period in the previous year. As an example, a March 2020 study conducted by the USA Nielsen Company found 240 per cent increases in internet alcohol sales, including strong liquors (spirits) by 75 per cent wines by 66 per cent and beers by 42 per cent[16][17]. There have also been press reports of increased domestic violence, which has long been associated with alcohol abuse[18]. Nevertheless, alcohol sales are not in themselves reliable enough estimates of alcohol consumption, because in these present circumstances, restaurants, clubs, and pubs have been all shut, i.e., those places where many people have been used to regularly drinking alcohol; especially young people.

Reports from the scientific literature are however, equivocal on this issue. There have been increased trends shown in alcohol consumption, drunkenness, and alcoholic excesses during economic crises (e.g., the 2007–9 recession)[19]. In contrast, it ought to be stressed that economic crises reduce alcohol consumption in some people, mainly due to financial problems, or the risk of losing one's job because of continuing to excessively drink. Nonetheless, the current crisis differs from the ones aforementioned. This is not only an economic issue, or a dramatic one-off event, but a complex multi-faceted experience affecting billions of people worldwide in spheres such as medical, social/societal, political, geopolitical, economic, religious, cultural, axiological, and civilisational dimensions. Therefore, this covers almost all areas in the lives of individuals and societies.

The pandemic situation now confronting humankind can be considered to be rather a complex and multiple-stage crisis, affecting the many aspects of health, including mental health; in both societal and individual dimensions . Notwithstanding, the threat posed by the virus itself, various psychological problems may arise from the enforced lockdown and isolation (i.e., quarantine) along with economic threats. All this can elicit a wide spectrum of disorders of varying severity, particularly problems in concentrating, anxiety, depression, insomnia, aggression, and interpersonal conflicts. The intensity of these symptoms, may at least in part be due to the duration and extent of the quarantine, a feeling of loneliness, fear of infection, and access to appropriate, or inappropriate information.

Conclusion

At this time of crisis, the rapid implementation of extraordinary changes is not something "obvious" and "automatic", but requires a strong effort of adaptation and the active participation of all people, including users (tobacco, drug and alcohol). Being in quarantine can be challenging for addicts, especially substance addicts. Forced isolation and difficulties to move around and obtain substances like tobacco, drugs and alcohol can impact the behaviour of abusers.[20] Moreover, the psychological impact of quarantine may

have exacerbated, a number of mental health problems.

Addictions are already a manifestation of psychological discomfort, and these circumstances may have worsened psychophysical well-being. Depression and self-harm behaviours leading to suicide have been also anticipated. Additionally, new obstacles for obtaining drugs and alcohol will emerge, worsening the troubles of addicts. The current crisis prevents illicit drug and alcohol trafficking on the streets, and imposes the use of alternative methods for obtaining drugs and alcohol via the internet, through specialised websites, and their subsequent shipment by private couriers. Hence, an increase in cannabis product online sales was recorded, during the first 3 months of 2020 [21].

During the pandemic, it may be necessary to suspend, or reduce the number of face-to-face meetings and implement alternatives. The continuous operation of drug and alcohol treatment services, including the continuous supply of substitute therapies and other essential drugs, and the implementation of contingency plans to address any shortage of therapies and tools, should be ensured.

Before the pandemic, patients receiving methadone/buprenorphine and other medication for drug and alcohol treatment, had to follow an approved treatment program, under which the drug could only be administered daily and under supervision. This may not be possible at this time. Patients under opioid addiction treatment, with a reasonable degree of stabilisation, should obtain several doses of methadone/ buprenorphine in sufficient quantity for several days, or refill their buprenorphine prescription over the phone[22]. The public health community should also focus efforts on the development of virtual support meetings, for people with psychiatric

disorders, or undergoing addiction therapy, and the possibility to take home medication. In addition, it is worth noting that there is a high prevalence of HIV infections, viral hepatitis infections, and liver cancer among intravenous drug users, leading to a weakened immune system. Therefore, the current health crisis could limit access to healthcare, putting this population at risk for many diseases, as hospitals and clinics are already stretched to their maximum capacity[23].

These people, who are already stigmatised and underserved by the health system, could therefore face even greater barriers to treatment, increasing their chances of falling ill and being rejected by charities, forcing them to live on the streets or in squats. Self-isolation, required by lockdown and subsequent movements limitation, for homeless drug addicts can be problematic, as they have no choice but to spend time in public spaces with limited personal hygiene, increasing the risk of infection from COVID-19. Addressing the needs of homeless or unstable drug users is important. The efforts of not-for-profit organisations and associations could help in the short term, but they also must address the increasingly stringent measures, dictated by governments and closely monitor the safety of their workers.

As suggested by the US National Institute on Drug Abuse, and the European Monitoring Centre for Drugs and Drug Addiction; a range of resources has to be developed to support situational awareness, and inform relevant and timely actions for preparedness and response activities at national and international level, related to the impact of the pandemic on the drug situation, and eventual new trends of drug abuse. Psychiatric and psychological assistance to addicts undergoing substitution therapy should be implemented through any possible alternative means, during COVID-19 pandemic.

Telemedicine: Embracing Virtual Care During COVID-19 Pandemic

Abstract

Telemedicine or tele-health facilitates care from a distance through electronic information systems. The COVID-19 pandemic is establishing telemedicine in the health care delivery system of countries. Tele-health is contributing significantly in health care delivery during the COVID-19 crisis. For mild to moderate symptoms of COVID-19 or any illness, tele-health services might represent a better, efficient way to receive initial care and perform triaging. Telemedicine also has a significant role in screening for COVID-19 symptoms, and deliver routine needs and follow-up care. Large-scale adoption of telemedicine in public health care delivery is still not visible in low and middle-income countries such as India. Adoption by patients as well as healthcare professionals is limited and their concerns need to be addressed to ensure its utilisation in future of the care continuum. In the current paper, we aim to review recent measures of telemedicine adopted during the course of pandemic and its impact on public health in lower-middle income countries like India.

Introduction

The key issues faced by health care across countries include access, equity, quality and cost-effectiveness. The problems are more aggravated and intense at the time of outbreaks, pandemics and disasters when the already frail health system is over-burdened, and nosocomial transmission of infections is a challenge. Technology of telemedicine has great potential to help address these concerns. Telemedicine is *the delivery of health care services, by all healthcare professionals using ICTs for the exchange of information for diagnosis, research, evaluation, and for continuing education of health care providers.* Telemedicine, a part of tele-health, where the former pertains to service delivery by physicians, and the latter signifying services provided by health professionals in general, including nurses, pharmacists, and others.[1]

Telemedicine promotes interests of advancing the health of individuals and their communities.[1] Though the term was coined in late 1970s and literally meant "healing from distance" the acceptance of telemedicine in various parts of world happened in early 2000s. In the wake of COVID-19 pandemic, telemedicine has been advocated to be adopted aggressively in the process of health care delivery. Lower middle-income countries like India are yet to take up the technology, and benefits from telemedicine. However the COVID 19 pandemic will lay down systems for the practice of telemedicine on an urgent basis.

Telemedicine and virtual care have become an important tool in caring for patients at COVID -19 pandemic time, while keeping health care workers and patients safe. Explosive rise in number of cases in the community with many cases in home isolation, telemedicine is the only viable option available to monitor them and ensure timely referral. Platforms of tele-consultation are being utilised in surveillance and primary care delivery during home isolation of asymptomatic/mild COVID-19 cases.

Triaging of patients by primary care practitioners will ensure that health facility and logistics are reserved for patients who need them most.[2] With the fear of disease transmission, many primary care physicians are adopting technology for delivery of other routine health care services to patients, reducing in-person clinic visits. Rational use of man-power can be ensured, wherein health care providers in high risk category, with co-morbidities and on isolation post infection can also be utilised for telemedicine services.

Tele-health can serve as an important tool for epidemiological surveillance to identify hotspots, estimate the burden of the disease and provide disease control measures. This platform can be used for health education of individual, family or group of people on various risk factors and for disease prevention of communicable as well as non-communicable diseases.

Centre for Disease Control and Prevention (CDC), USA updated their interim guidance on infection prevention and emphasised on the implementation of telemedicine facilities to minimise the chance of transmission.[3] WHO has mentioned telemedicine among its recommendations for essential services in strengthening the health systems response to COVID-19 policy.[4] It could be used in forward triage, where patients can be screened before reaching the health care facility.[5] This will help in early identification and transfer of suspected cases, without coming in physical contact, thus

reducing the risk of infection among health care workers and public.

The majority of patient consultations in the United States are now happening virtually, and there has been a ten-fold increase in consultations. Scotland, has seen a surge of 1000% on use of video conferencing.[6] On March, 2020, Medicare, administered by the Centres for Medicare & Medicaid Services (CMS) had paid clinicians to provide tele-health services for beneficiaries in US, by waiving off restrictions and has allowed for more than 80 additional services to be furnished via tele-health. Doxy.me, eVisit, Vsee, and Mend are some of the telemedicine providers available in US.[7]

In China, the epicentre of pandemic, implementation of telemedicine services decreased the death rates and lowered incidence of COVID-19, particularly in Shangdong province. Telemedicine provided prevention and treatment guidance, training, communication, and remote consulting for the community residents as well as medical staff, thus, playing a considerable role in controlling the COVID-19 epidemic in this province.[8] Patients were advised to seek physician's help online, rather than in person which increased the number of consultations significantly. European Union and countries in Asia expanded laws and regulations to permit greater adoption of telemedicine systems, providing increased guidance on digital health technologies, cyber-security expectations, and expanded reimbursement options. Italy, in the course of pandemic implemented telemedicine guidelines, promulgated by the Italian Health Council in 2012, to facilitate greater use of telemedicine technologies throughout the country.[2]

In France, the Ministry of Health allowed the reimbursement of video tele-consultations and tele-expertise by the National Health Insurance (NHI), for patients with confirmed COVID-19 infection, without the need of prior registration. The nurses and midwives involved in follow-up of patients were incentivised as the pandemic worsened. Paris saw a surge in tele-consultations following the pandemic, with 44% of general practitioners conducting at least one tele-consultation.[9] Public-private collaborations were established in Spain, with private providers facilitating the use of their telemedicine platforms for the public health providers.[10] Inpatient care for non-communicable diseases during the pandemic also witnessed the successful trials of virtual care, compared to traditional care regimens.[11] [12]

India is a developing country with over 1.3 billion population, majority of whcih are residing in rural areas.[13] There are concerns of inequitable health care delivery, due to poor access and availability, along with a weak public health care system. Telemedicine was initiated in India as a pilot project of Indian Space Research Organisation (ISRO), by Chennai's Apollo Hospital, in early 2000s.[14] Thereafter, some successful telemedicine projects in India include mammography services at Sri Ganga Ram Hospital, Delhi; Oncology at Regional Cancer Centre, Trivandrum; provision of medical care at the time of Maha Kumbha melas; and disasters like Tsunami, which had struck the Indian coast in 2004.[15] [16] [17]

Recent initiatives like National Medical College Network, National Telemedicine Network, Use of Space Technology for Telemedicine have been done. However, these projects are limited in geographic location and utility. The large-

scale adoption of telemedicine in public health care delivery is still not visible.

Despite the stringent lockdown and physical distancing measures to contain the transmission of virus, India has seen a surge in cases of COVID-19. Lack of access to health care is a major challenge in the period of lockdown.[18] Such incidents have paved the way for recognition of telemedicine, where health care delivery could be made ubiquitously available.

The Indian Government has adopted telemedicine to reduce direct doctor-patient contact during the course of pandemic. In view of the increasing importance of telemedicine at the time of COVID-19 pandemic, the guidelines on practice of telemedicine published in 2005 were revised in 2020 to focus on medical ethics, data privacy, confidentiality, documentation, digital records of consultation, and process setting of fees for telemedicine. It emphasises on principles of medical ethics, including professional norms for protecting patient privacy and confidentiality, as per Indian Medical Council Act.[19]

Several measures thereafter were introduced by the Central and State Governments to boost telemedicine services in country.

All India Institute of Medical Sciences, a premiere institute has started providing consultation to patients on non-COVID-19 ailments, through telemedicine. 'Call Doc' and 'DR YSR Telemedicine' are initiatives by State Governments during COVID-19 to deliver OPD services.

In Delhi, the Government has joined hands with 'Call Doc' app to launch 24×7 free online medical consultation services to help the patients connect with doctors remotely through mobile application, for non-emergency medical needs. The user is able to connect to doctor through video, audio, or chat and can later receive the consultation over phone by using this mobile app. The patients can upload their test reports for doctors to review. The doctors can upload prescriptions on the app after consultation. 'DR YSR Telemedicine' helps the health department to locate people with symptoms of COVID-19 in Andhra Pradesh. On receiving a missed call, an executive collects the detail of the patient, and a doctor will respond through audio or video conference, and will prescribe the medicines and tests required through SMS. COVID-19 symptomatic patients will be sent to PHCs, district, and state-level hospitals, for further treatment.

Barriers and Challenges to Telemedicine Adoption

Characteristics of end users need consideration while designing user-centred telemedicine intervention. Age, gender, education, socio-economic determinants, digital literacy and social environment are key parameters to consider.[20] [21] [22] Computer literacy, linguistic barriers between the provider and patient, and unawareness of the existence of services, can lead to failure in adopting telemedicine in community.[23] [24] [25]

The high cost of implementation and poor policies of reimbursements for care delivered through telemedicine, can result in resistance to change for adoption of digital innovations among physicians. Licensing issue is a significant barrier because countries and states within countries require individual licensing requirements. A shortage of studies documenting economic benefits and cost-effectiveness of telemedicine applications is a challenge, which has resulted in inability to convince the policy makers to invest in telemedicine.

Legal considerations such as absence of an international legal framework, to allow health professionals to deliver services in different jurisdictions and countries, lack of policies that govern patient privacy and confidentiality, health professional authentication; are major obstacles to telemedicine uptake.

Confidentiality and privacy issues could also pose challenge. Issues include breach of personal health information that can occur on unsecured networks, as well as unlocked and unencrypted hardware that can be accessed by third parties. The lack of available high-speed bandwidth, complex application design can also hamper the smooth functioning of the novel system. Also, technological challenges like software or hardware failure which can result in malfunctioning, also pose challenge to implementation of telemedicine. Thus, the top barriers are technology specific and could be overcome through training, change-management techniques, and alternating delivery by telemedicine as well as personal patient-to-provider interaction.[26]

Way Forward

We hope that this pandemic of COVID-19 would mark a shift in health care delivery system with more people accepting tele-consultation, and a change in face of health system of the country. With the aim of achieving universal health coverage in India, there is leap in adoption of digital health platforms in health sector, following the release of National Health Policy 2017. The Blueprint on National Digital Health focuses on the standards for maintaining confidentiality and privacy of patient, which health systems should incorporate to enable adoption of electronic health records.[27] Telemedicine can further effectively gain from such systems established.

Telemedicine holds promising future in India with unprecedented growth and development in information and communication technology (ICT) system. Satellite transmission, high-speed broadband connectivity, mobile and wireless telephones are making inroads into suburban and rural India.[28] Other key growth drivers include the widespread use of wireless and web-based services, and improving technology which includes the adoption of 3G and upcoming availability of 4G spectrum as well as optic networks.

More studies are required in Indian settings to identify perceptions of community towards tele-consultation and to identify area specific barriers as well as challenges. Rapid establishment of telemedicine can spearhead change in the overall health care delivery, simultaneously addressing the contemporary global health issues.

Conclusion

In all countries, issues pertaining to confidentiality, dignity, and privacy are of ethical concern with respect to the use of ICTs in telemedicine. It is imperative that telemedicine be implemented equitably, and to the highest ethical standards, to maintain the dignity of all individuals as well as to ensure that differences in education, language, geographic location, physical and mental ability, age, and sex will not lead to marginalisation of care.[29] This pandemic has paved light on the importance of telemedicine in service delivery, and how it is going to be accepted in future. Policy makers and health care providers should be mindful to accept the advantages of delivering care through virtual mode in this digitalised world, and should encourage development of policies and guidelines on the subject, on an urgent mode to support the uptake of telemedicine in an efficient manner.

Photo Source - Business Standard

The Need for Community Based Grassroots Preparedness and Legal Framework to Respond to a Pandemic

COVID-19, the pandemic that the world is currently facing, has several lessons for a healthcare legal framework in India that will effectively address the health needs of its people.

To tackle the pandemic, India has mostly been relying on two legislations - The Epidemics & Diseases (EDA) Act, 1897 and The Disaster Management Act (DMA), 2005. Both of these legislations are fraught with problems and limitations.

The EDA is an archaic legislation set up in the colonial era (airports did not even exist back then) and has not been updated adequately since its implementation.[1] The DMA has its limitations. It was drafted primarily to respond to natural and man-made disasters. Its drafters, perhaps, were concerned about natural disasters more than anything else and the idea of a response to a pandemic may have not even been in sight. It is a central legislation and public health is a state subject. There have been several issues, including those of

quarantine rules, economic activities, closure of state borders and coordination between different government agencies. Also for Central and State Governments to facilitate movements in certain cases in accordance with proper uniform guidelines, clear provisions are needed on roles as well as powers of different levels of governance authorities. Confusion on the part of different governments and their institutions may not be easy to avoid, given the volume of population and complexities involved. Therefore, there is a need for an effective law that would help overcome these difficulties.[2] Further, the scope of the DMA is only limited to man-made or natural disasters and not epidemics.

While the Constitution of India is silent in terms of explicit provisions with regard to a Health Emergency, Entry 29 of the Concurrent List provides for, "*Prevention of the extension from one State to another of infectious or contagious diseases or pests affecting men, animals or plants.*" This provision in List III thus clearly empowers the Central Government to steer the management under such conditions because even in the event of any inconsistency arising between the laws made by the State and the Centre, the central legislation will prevail in light of Article 254[3].

Apart from this, State Governments also invoked provisions of Epidemic Disease Act, 1897. The Central Government also promulgated an Ordinance dated 22nd April 2020, *The Epidemic Diseases (Amendment) Ordinance, 2020* which significantly amended the erstwhile statute and included provisions for prohibition of violence against health workers. Some states such as Tamil Nadu further relied on state legislations like the Tamil Nadu Public Health Act, 1939. But broadly the pandemic was managed under the Disaster Management Act, 2005.

International Health Regulations 2005 and National Centre for Disease Control (NCDC), 2009

The foreword to the International Health Regulations, 2005 (Third Edition) outlines that a central and historic responsibility for the World Health Organisation (WHO) has been the management of the global regime, for the control of the international spread of disease. Under Articles 21(a) and 22, the Constitution of WHO confers upon the World Health Assembly, the authority to adopt regulations "designed to prevent the international spread of disease" which, after adoption by the Health Assembly, enter into force for all WHO Member States that do not affirmatively opt out of them within a specified time period.[4]"

The purpose and scope of the IHR (2005) are "to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade.[5]"

The IHR that came into force in 2007 makes it binding on all member states to rapidly share information on occurrences of public health emergency of international concern.[6] India is a signatory to this.

The activities at the national level include the designation of the National IHR Focal Point, initially assigned to the National Institute of Communicable Diseases (NICD) under the Ministry of Health and Family Welfare. In 2009, NICD transformed into the National Centre for Disease Control (NCDC), with a larger mandate for controlling emerging and re-emerging diseases.[7]

The mandate of NCDC is also to notify Public Health Emergencies of International Concern (PHEIC) to WHO. This would help to respond to requests for verification of information of such events, support field investigations for early diagnosis and arrange for technical guidance to the States for the timely and effective response to PHEIC.[8]

Once a "disaster" is declared by the Government, the provisions of the DMA apply.[9] However, there is no clarity in the standard operating procedure that would be adopted by NCDC, where the situation is not classified as a "disaster" but as an "outbreak" or "potential outbreak". It is unclear as to how the different ministries would be mobilised by Ministry of Health & Family Welfare (MOH&FW), in case of an imminent outbreak that is yet to be declared an emergency. The enabling provisions to take control measures across all relevant ministries, in case of an outbreak to mobilise different authorities under the multiple laws governed by different ministries, need to be identified.[10]

The DMA clearly lays down a multi-dimensional strategy to handle pre-disaster and post-disaster situations and mandates certain actions by the officers of different ministries to work in tandem, in mobilising resources across the ministries and departments thereunder, to control and contain the damage wrought/ liable to be wrought by a disaster. This is not the case for NCDC, which reports all matters to the Director-General of Health Services, MOH&FW. There is no legal mandate authorising MOH&FW to approach the relevant ministries every time there is an imminent outbreak, unless it can invoke certain legal provisions under enacted law and request direction from the other ministries. This can be especially tricky in a situation where there is a separation of powers between the Centre and the State.[11]

Bills in Pipeline

While the Central Government is certainly more empowered to legislate on matters in the event of a pandemic, two major legislations are still pending in the Parliament - the National Health Bill, 2009 and the Public Health (Prevention, Control and Management of Epidemics, Bioterrorism and disaster) Bill, 2017.

The Public Health (Prevention, Control and Management of Epidemics, Bioterrorism and disaster) Bill, 2017 aims *to provide for the prevention, control and management of epidemics, public health consequences of disasters, acts of bio terrorism, or threats thereof and for matters connected therewith or incidental thereto*. Some pertinent definitions within this Bill arouse interest specially when the country tries to overcome a pandemic of this nature including those of 'epidemic', 'public health emergency' and 'quarantine' to name a few. While these words would have had little meaning in 2017, the India of 2020 understands these better than before. This Act would also repeal the Epidemic Disease Act, 1897. The Bill empowers the State as well as the Central Governments to declare health emergencies. The Central Government is empowered under Section 4 to ascertain a health emergency, likewise the States derive their authority from Section 3 of the Act.

Though this Bill covers many aspects rather comprehensively, it is painfully silent on the duties and obligations of the governments other than just providing for institutional framework. The migrant labour crisis, as witnessed in this pandemic raises further questions with regard to the social obligations the state will undertake in the event of such health emergencies. These concerns could have been addressed by another legislation, the

National Health Bill, 2009. The Bill recognises health as a fundamental right, and guarantees every citizen a right to highest attainable standards of health. Thus, while the former Bill dealing with the procedures and protocols to be undertaken during a pandemic, the latter entrusts responsibility upon the State to ensure that excesses are not committed by the State under the guise of beneficial legislations.

The Public Health (Prevention, Control and Management of Epidemics, Bioterrorism and Disasters) Bill, 2017 exists but has no statutory value as of now. "It falls prey to the flawed approach of heavy-handed policing provisions, while failing to define the roles and functions of government, ensure the protection of patient rights, and institute swift and accessible dispute resolution processes."[12] Even the National Health Policy, 2017 has a certain section dealing with Emergency Care and Disaster Preparedness. Sections 8 and 13.5 of this policy lay down that in case of a disaster, healthcare must be available at the CHC (Community Health Centre) level. However, the disaster envisaged by this policy is in the form of earthquakes, or floods but not a pandemic.

A specific legal framework to respond effectively to a pandemic or health emergency is, thus, much needed to address the issues and problems. Such a framework must lay down the powers of States but also create an effective communication channel between them and the centre, with provisions and mechanisms for quick directives as per the need. This framework should also ensure availability of adequate resources and preparedness at the local level – panchayats and municipalities – for emergency responses. Local bodies and institutions of local governance need infrastructure and empowerment to respond to challenges.

Recommendations

The following suggestions and recommendations, *inter alia*, need attention:

1. Devising a Balanced Surveillance System

COVID-19 surveillance is operationalised through the existing integrated disease surveillance program (IDSP) network.[13] The present system requires that there needs to be a consolidated database which would provide clarity on the disease index in different clusters in the country. That is the primary requirement, and the Government should immediately ramp up the process of building an infrastructure to assist in collecting such data by making it a door to door testing process. Through the use of such an extensive process, basic health anomalies can be instantly recorded by means of collecting blood samples for the purposes of identification of non-communicable diseases such as diabetes, etc. At the same point of time, the Government must be careful about the requirement to keep these data under multiple layered protection, which can be accessed solely for the purposes of public health initiatives. The management of the same shall be kept solely at the discretion of the designated health authority.

There needs to be a mechanism in place to look at the issues of identification of infection, and the same must be carried out in a non-invasive fashion. Sewage water surveillance presents an opportunity to assess infection burden, and to identify communities requiring more intense human testing, risk communication and containment. Such a system allows for population based monitoring of caseloads, including asymptomatic cases.[14] This surveillance data could be utilised for an integrated analysis

and data of sewage water, and the IDSP data could be mapped together to identify hotspots and high-risk population, which would allow for more targeted efforts and more specific interventions.

It could be carried out in three stages. The first stage would have integrated analysis, as illustrated above which needs to be extended to other re-emerging diseases. The focus should be on risk prediction and hotspot identification at the early stage. The second stage would have the surveillance data of the individual sectors, which would then require them to adhere to a set data standard to allow data sharing through an integrated database. Digital initiatives in India, such as the Open Government Data Platform could be a portal to facilitate the integration of sectoral databases, which can then be realigned to form clusters.[15] The final step would have comprehensive investigations of risks by multidisciplinary teams across the sectors. Such multidisciplinary collaborations are required both at policy and the grass-root level, to enable more rapid risk detection and consequent prevention and containment actions.

2. The Requirement of Stepping Up Vaccination Machinery

Immunisation is one of the most cost-effective public health interventions to date, averting an estimated two to three million deaths every year.[16] To achieve full immunisation coverage of all children and pregnant women in India, the government launched **"Mission Indradhanush"** in December 2014. Reaching out to the target beneficiary located in the remote parts of the country, carrying out the vaccinations as per immunisation protocols, community mobilisation of the society towards acceptance of vaccination, and maintaining

the cold chain of the vaccines in extreme hot and cold conditions; are among many of the challenges associated with immunisation coverage when the situations are favourable in the country.

One of the crucial elements affecting immunisation is the supply chain of the vaccine, which is responsible for delivering the product from the site of manufacturing to the target beneficiary. Lockdown has not only impacted the export from major manufacturers of vaccines like India but has also jeopardised the import to many countries which are also confronted with nationwide lockdown, or import restrictions, preventing them from receiving the vaccine.[17] Therefore, revisiting export and import policies for prophylactics during the pandemic outbreak should be a point of concern and strategic decision for the manufacturers, exporters and importers of vaccines. The points below should therefore be the point of concern of discussion and future planning to counter the deficiencies faced in immunisation services during COVID-19:

I.   Causes of missed schedule of vaccination should be investigated from the community, and mitigation strategies should be framed.

II. Logistics management of vaccines during the outbreak should be a point of concern. Strategic decision and critical thinking should be undertaken by manufacturers, exporters and importers of vaccines, United Nations (UN) agencies and government authorities.

III. The three-tier governance structure should be further empowered at the lowest level to carry out urgent decisions. They should be adequately given the responsibility to carry out

such programmes in accordance to their favourable routes and passages, that is in accordance to their localities practice. The approach should be to use a decentralised system in terms of making use of all the resources, since mostly these drives are any ways carried out by the people working at the grass roots.

IV. Certificates must be signed in the hand of the clinician, who must be a medical practitioner or other authorised health worker, supervising the administration of the vaccine, or prophylaxis. The certificate must also bear the official stamp of the administering centre; however, this shall not be an accepted substitute for the signature.

3. A Step Towards Reassuring the Health Workers

The health workers form the backbone of a dwindling system when it comes to any health emergency. It is the duty of the Government to look after the basic interests of the health care providers, and to ensure that they feel secure within the system. It must be noted that the basic concern the health care providers have is to do with their primary protection, and the safeguards that the Government would provide them with. The following are the details of the several basic demands that shall be fulfilled:

I. The demand of the doctors for high-risk allowance during this unprecedented period should be accepted. The same should be provided from the standpoint of offering compensation to the families of fallen warriors. The amount shall be decided in consultation with the Health Ministry of the concerned state. However, the most pressing concern should be to provide the workers with some incentives such as insurance covers to protect them during their services or beyond, if they happen to contract some disease.

II. The hospitals need to be secured firmly. Instead of deploying scarce policemen in hospitals, the Government should appoint special police officers (SPOs) for each hospital. The provision for appointing SPOs is given in Section 17 of the Police Act, which can be invoked at a time of emergency, to make up for the shortage of police personnel. Each hospital, however, has several private security guards, who can be appointed as SPOs. Once declared SPOs, they have the powers of the police and can work in the same fashion. In case of attacks on doctors and nurses, they can immediately take action. One liaison officer from the local police station can be designated for each hospital for coordination. This will raise the morale and confidence of the doctors and bring order to the proceedings in the hospitals. An honorarium can be fixed for them from the time they perform duties as SPOs. In rural areas, the village kotwals should be made SPOs. Odisha's Chief Minister has already taken a historic decision of giving the power of a collector to Sarpanches to enforce the quarantine measures. Empowering panchayats and local bodies will help fight the epidemic better, and other states should follow Odisha's model.

III. The doctors have demanded security, while commuting to work and back. A few overzealous resident welfare association (RWA) office-bearers have displayed hostility towards the resident doctors treating COVID-19 patients, while some have been attacked outside hospitals. Arrangements must be made for such health workers who

require temporary accommodation and transport. Some hotels have already volunteered to host them at their venues. More guest houses and public venues need to be requisitioned to accommodate all those who desire these facilities. In addition, a team of police, municipal and revenue officials should caution and rein in these RWA officials against any moves to oust the doctors from society premises and, if necessary, take stern action. Such doctors should also be given helplines to contact in case of need.

The concerns pointed out are by means exhaustive, and other due concerns as and when raised shall be duly considered after giving emphasis on them. There needs to be the incorporation of a Charter of Rights of Health Workers, and the same shall be a detailed process. It should be done in due consideration with the primary stakeholders i.e. the health workers.

4. The Requirement for the Formation of a Task Force

It is the urgent requirement of the hour to create a collective deliberation mechanism to take note of the smallest of concerns. This is the time for the international community to build a consensus over the rising health concerns across the globe. The time is ripe to invest into health infrastructure globally, and attract investors to that effect. India could build itself into a global example of building a consensus mechanism, to lay enough emphasis on funding required for the health sector.

The same should be looked into by urgently setting up task forces in each state, to identify the primary health causes for the reasons of fatality. The same shall be done

by empanelling the key stakeholders into the task force, where the primary health care investors should be taken on board. In case World Bank provides assistance to a state in terms of building health infrastructure, or the respective state looks at the World Bank as a future collaborator when it comes to funding public health, then the state shall have advisors from the World Bank in such task force. The reports of each state shall be compiled in a holistic and detailed manner, to lay enough emphasis on the ground reality prevailing in each state, and their geographical position making them vulnerable to certain ailments.

The most important task shall then be carried forward by the Central government, to try and help each state to find possible investors. The role of the Central government shall not only be limited to that effect. The very distinct nature of India's governance requires the Centre to moot some unique propositions at least in the health emergencies. For such purposes, the Centre shall also put into place a Committee consisting of representatives from WHO, World Bank, IMF, Asian Development Bank, distinguished and eminent members from the medical fraternity and representatives of the State governments and the Centre. The same shall be done after taking into consideration the State's preparedness when it comes to health emergencies, and the efforts shall be made to develop medical hubs in clusters across the country, so that there is no dependence on a few cities when it comes to advanced medical treatment.

5. Ensuring a Mechanism for "Patient Rights"

There is a dire need to protect the interests of the patients, especially during and after a pandemic, where patients belonging to the

lower strata of the society might not be able to pay their bills owing to financial constraints, resulting out of a loss of livelihood. There have been several instances where patients have been held hostage over non-payment of dues[18], been refused treatment and turned away from hospitals[19], or been heavily overcharged.[20] All these are violations of not only the fundamental rights of the patient, but also of their human rights.

In order to prevent such instances from occurring, there must be a specific legislation which lays down the rights of the patient. One such policy framework - "The Charter of Patients' Rights"[21] has been introduced by the N.H.R.C and the MOH&FW. The charter lays down the basic rights that must be accorded to patients, and also lays down guidelines for the health professionals to follow. It is our opinion that this Charter should be given statutory legitimacy (which it currently lacks), so that violators can be held accountable by law.

Another facet that must not be ignored is "What happens to the hospital which violates patient rights?" Currently, the only recourse is going via the route of litigation, which may go on for years altogether. During this process, it is often seen that the hospital might get sealed, which might be counterproductive especially during a pandemic where the sealed infrastructure is put to good and productive use. Instead, a new mechanism of accountability, akin to the 'Medical Ombudsman' in Scandinavia must be set up, where the systemic deficiency is remedied, and it is ensured that the breach in question does not take place again.[22]

6. Emphasis on Mental Healthcare Schemes and Insurance Policies

While the Mental Healthcare Act, 2017 is a welcome step towards ensuring that mental health does not go unnoticed, additional safeguards need to be implemented. There still are a plethora of mental health issues which go unnoticed. Couple this with a post pandemic world, where the people would have to deal with the traumas of the lockdown and a slowdown in the economy - there would be a guaranteed rise in Mental Health ailments like stress, depression[23] and self-harm tendencies.[24]

There is a lot that can be learnt from Assam's Mental healthcare scheme 'Monon'[25] and Kerela's approach towards dealing with Mental Health ailment post tragedies. The Assam Model has been quite successful in dealing with post COVID mental ailments - particularly PTSD, depression and clinical anxiety. Kerala has an even robust system in place. It is the only state to have a District Mental Health Programme (DMHP), under which a team of professionals visit the primary health centres once every month. This ensures that Mental Health is being addressed at the primary level itself.[26] Under the same scheme, Kerala has also ensured that medical help is available effectively to everyone through telemedicine.[27] In fact, even the WHO has acknowledged the success of this mental health scheme.[28]

Another important aspect to be kept in mind while ensuring the availability of Mental Healthcare related professional services is

that mental diseases must also be covered in insurance schemes. Section 21(4) of the Mental Health Act, 2017 mandates that insurance companies should provide cover for mental illnesses, akin to those provided for physical ailments.[29] Despite there being a PIL in the Apex Court asking the IRDA to do the needful and the IRDA issuing guidelines to standardise health insurance policies, which among others, mandated that all insurers have to include treatment of mental illness or psychological disorders in their health insurance,[30] there has been next to no implementation so far.[31]

7. Need for Reviving Existing Infrastructure

The public healthcare system in India is regulated by the Indian Public Health Standards (I.P.H.S.) guidelines[32]. These set of guidelines lay down the basic infrastructural requirements of medical establishments based on their patient capacity. These guidelines, however, suffer from lack of implementation. Lack of beds, ventilators and medical personnel, despite provisions being there for the same in the IPHS guidelines, has proven to be detrimental during the COVID-19 pandemic. While the IPHS guidelines were revised way back in 2012, it is our opinion that even if we had conformed to the existing IPHS guidelines,

we would have been able to deal with the situation a lot better.

The goal is to shift to a rights-based democracy, where health rights are given utmost importance. The IHR, 2005 by WHO provide a basic framework and we should move towards the same. However, it requires encapsulation of the local issues at the largest sphere, to draw the attention towards the societal roots.

The recommendations are by no means exhaustive in nature, and only meant to show the bright possibilities that we need to bank on and develop a health infrastructure that is robust and responsive.

The DMA can guide an health emergency, or a pandemic law in terms of the mandate, reach and the required preparedness and capacities at the grassroots level, the attention at the district level, the functions at the level of local authority etc. Additionally, through the learning of the DMA, the framers of the new law should consider empowering the local authority and not only creating functions for it. Powers, capacities and preparedness at the level of local authority are much desired for communities to effectively deal with health emergencies as participants, and not mere recipients.

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Long-term Management of COVID-19 Pandemic in India

Overview

COVID-19 pandemic is an unceasing combat, where the Government system and health care, along with the local communities are trying their best to fight this current crisis. This pandemic has not only acted as a wake-up call for all of us as individuals, as a society, as well as a country to rethink and recalibrate our priorities; it has also brought to surface the readiness of the Government to take proactive measures. Developed nations such as the UK and the European countries are limiting the overall damage due to COVID-19, by focusing on building a strong recovery plan. However, for developing nations such as India with limited capacity and minuscule expenditure on health care (1.2% of the total GDP), managing an emergency of this nature is a herculean task. It highlights the critical need of the hour, a long term plan to boost the nation's capacity as a collaborative effort of the Government, the

public sector, the private sector, NGOs, and the local communities for future preparedness. It will also contribute towards building resilience for handling COVID-19, or other diseases/disasters in future. This can be done through revamping and strengthening our public health care system with adequate budget allocation, building robust health care infrastructure, and also ensuring universal health coverage.

While strategising and planning for a long-term management of COVID-19, we need to keep in mind the reality of Indian habitat settings, which can be broadly categorised into metropolitan areas, medium and small urban cities, and vast rural areas.

This article offers key recommendations for re-imagining and strengthening our advances towards new strategies and policies, in the above mentioned settings, depending upon the complexities of demography of the areas,

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Metropolitan Cities

In contrast to the imagination of the metropolitan cities as a hub of social and economic activity, they have arisen as the centre of disease and distress in the recent times, as the majority of the uncontrolled COVID-19 cases occurred in metropolitan cities. It is a matter of concern that despite having a reasonably good health care infrastructure, most of the metropolitan cities across India have been unable to mobilise resources and implement strategies timely and effectively, to contain the spread of the disease.

The crisis also revealed the absence of comprehensive and integrated urban planning, as well as the deep seated structural, economic and social inequalities faced by the urban poor, the migrants, and a host of people who are a part of the impenetrable social fabric, and are facing great difficulties in meeting their daily needs. The key vulnerabilities of the urban settlements are that the vast majority of this population lives in slums and peri-urban areas, which are often overcrowded with many people crammed into extremely small living spaces. These areas lack access to basic amenities including water, electricity, sanitation, solid waste management as well as planned housing facilities. In the context of COVID-19, or any other infectious diseases for that matter, implementing strategic interventions such as surveillance, physical distancing, regular hand-washing, and home quarantine is extremely challenging.

This crisis provides an opportunity to reflect and re-visit our urban planning process including governance, health infrastructure, as well as vulnerabilities of the urban communities. This being complex and fairly unique to the Indian phenomenon of neighbourhoods, where the urban poor and middle class live together.

Key Areas of Focus for Urban Preparedness for an Effective Response to COVID-19

I. Responsive Decentralised Urban Planning and Governance

The 74th Constitutional Amendment Act, in 1993 introduced a third tier at the local level to boost the urban local governance in India with a commitment to focus on the development of cities. Despite the renewed policy, the COVID-19 crisis has revealed the fragility of the local bodies that suffer financially as well as administratively, being heavily understaffed. The lack of institutional and human capacity of Indian cities to handle a public health emergency has also been also greatly reflected.

In order to manage the COVID-19 crisis in the long run, we need to make our cities more resilient to public health emergencies. This can be done with the help of the local communities, and shift towards decentralised planning, decision making and implementation at the community level; to provide efficient, economical, sustainable and unbiased healthcare across the country. The primary health care infrastructures in the cities are in a dire state to provide essential services at the local level. The secondary and tertiary healthcare facilities (both public and private), are concentrated in the heart of the cities, which is negatively impacting the timely delivery of the health services to the urban slums. We must learn from the Governance Model of Kerala and how it ensured community participation for delivery of health care services in times of crisis like COVID-19.

Governance of urban metropolitan cities has proven to be extremely muddled and nowhere near ready to face COVID-19, or similar crisis. Currently, cities deliver services through archaic and bureaucratic departments, where bureaucrats can be transferred out of office at a short notice which is clearly untenable. Metropolitan authorities should be led by directly elected mayors for long term with clear accountability for the city's performance. The public service delivery should be considered with sincerity. There are good examples within India such as Delhi, which has a quasi-statehood status and Kolkata which follows a modified mayor-commissioner model.

II. Strengthening Urban-Rural Linkages For Integrated Territorial Development

Rural and urban areas are economically, socially, and environmentally interlinked spaces. This interlinkage became more pronounced during the current crisis. The sudden lockdown of the nation, reflected on the dependence of the cities on its hinterlands for food security, and in in turn, the dependence of rural areas on cities for livelihood and access to basic healthcare and amenities was also seen.

The current fragmentation of urban planning and service delivery functions at multiple hierarchies of government establishments becomes even more complex and poorly coordinated across jurisdictional boundaries. It is important to strengthen governance mechanisms by incorporating urban-rural linkages into multi-sectoral, multi-level and multi-stakeholder governance for integrated territorial development.

Governance of Care and Community Participation - Kerala Model

Kerala presents a model of health governance where the leadership has long been informed by a perspective of partnering with people by sharing power.

The Government's response to the Coronavirus outbreak can teach us how to build a robust response to a major public health crisis. The State was the first to transfer the control of sub-centres (SCs) and primary healthcare centres (PHCs) (panchayat-level healthcare facilities) to the Local Self Governments (LSGs).

It also was the first State to allocate over a third of its health budget to LSGs. It is estimated that more than 85 per cent of beneficiaries in Kerala have access to primary care through ASHAs.

During the lockdown in March-May 2020, decentralised planning and management along with the coverage of public health programmes led to effective contact tracing and quarantine, without any negative impact on the delivery of essential services in the State.

Horizontal integration in metropolitan regions, adjacent cities and towns, including rural hinterlands is required. This along with sectoral convergence of all public departments and private sectors, civil society organisations, research and professional institutions, formal and informal civic associations. It is also crucial to embed human rights-based approaches in all the policies and actions, to ensure that development initiatives and processes do not negatively affect anyone's human rights across the urban-rural continuum. One of the ways is to empower and ensure meaningful participation of people, local institutions and communities across the urban-rural continuum; addressing the essential component of SDG Agenda 2030- "to leave no one behind".

III. Reorganisation of Health Services and Strengthening Urban Health Infrastructure

The concentration of public tertiary health facilities, and impressive private hospitals in the metropolitan cities makes it easy to overlook the fact that there is limited access to healthcare facilities; especially when it comes to primary care in urban areas. For example; NCT Delhi has merely eight Primary Health Centres (PHCs) and zero Community Health Centres (CHCs) but has 134 tertiary care hospitals, including general as well as speciality, super and multi-speciality hospitals.

Today, the country is faced with the reality of urban health care, as about 60 per cent of all hospitalisations in the cities have been in the

private sector, all of which may not be fully regulated. The hospitals are well-equipped, however, not everyone has been able to access quality health care services; the primary reason being affordability, as well as the socio-economic gap. The fault lines in the health care system and delivery mechanism became especially prominent in the small, urban slum settlements during the current COVID-19 crisis.

a) Adequate Budget Allocation: The COVID-19 pandemic acted as a wake-up call for us to increase our investment in health. We should also learn from our neighbouring countries like Bangladesh and Pakistan who are spending a bigger share of their GDP on health, as compared to India. To meet the health demand of 37.3 crore Indian population living in urban areas (Census 2011), the first and foremost need is to have adequate budget allocation for NUHM, ensuring utilisation of the allocated budget through effective and timely implementation of the services under NUHM.

b) Strengthening Primary Health Care Delivery Mechanism: During the COVID-19 crisis, a stronger and tiered structure of primary health services in cities could have served as the first point of testing, care and management of mild to moderate COVID-19 patients, alleviating some of the burden on tertiary systems. It is an opportune time to revisit and strengthen the National Urban Health Mission (its potential largely remains untapped). Having a strong network of primary and community health centres including Health and Wellness Centres in cities, can lead to more equitable health outcomes, as well as help us to systematically deal with rising urban

health challenges including COVID-19. It is important to establish reliable and functional referral linkages between UPHCs and higher level of care.

c) Involvement of Communities and NGOs in Health Programmes/ Outbreak Management: There is an urgent need to empower communities to take control of their health by strengthening participation in local health programme's planning and implementation, by helping them identify their priority health needs. Reinforcing the participation of all segments of society from the local communities, notably the most vulnerable such as women, elderly, youth and children, disabled, migrants and minorities with the support of civil society organisations; can ensure improved service delivery at the local level. It can, thus, promote transparency and accountability of the Government health system.

In order to ensure effective local health care and management, ULBs and community groups need to be trained on basic healthcare and crisis management to handle disease outbreaks or disasters; as well as strengthen capacity and support mechanisms at the regional level. It is advisable to form Anti-COVID-19 squad (each having 10-15 youth volunteers) at the local level, which can work closely with the Rapid Response health team to monitor and review the situation on the ground level, particularly in urban slums. Better communication and coordination between local and higher authorities is needed to ensure coherent, aligned as well as effective

preparedness and response.

d) Role of Private Sector: Private sector participation is critical for bridging the gaps in basic health services in urban areas. Given the high proportion of patients seeking care in the private sector, it is important to harness its large pool of resources by enforcing regulatory mechanism, so that more people are able to access quality services at an affordable price.

e) Adequate attention to Public Health: The existing delivery mechanism in health care services is largely focused on reproductive and child services. Public health is a neglected priority. The recent outbreak clearly articulates the need for a broad based public health programme. It is of utmost importance to strengthen the promotive and preventive aspects, along with the curative health services.

f) Addressing Social Determinants of Health: We must remember the linkages between health and other determinants, such as availability of regular supply of clean water and soap. Residents in informal settlements often rely on ill-maintained community toilets and shared taps. While the Swachh Bharat Mission has been able to drive a shared understanding about the benefits of sanitation, we must expand on this. Health initiatives must be effectively integrated with supporting sectors such as drinking water and sanitation, social welfare, women and child development, transportation, and school education; to ensure proper provisioning of basic facilities including adequate safe drinking water, sanitation and common area hand washing

facilities, especially in urban slums.

g) Behaviour Change and Communication: Along with addressing the health and social determinant of health issues, it is of utmost importance to create awareness among the people about health promotion, self-health care and prevention of infectious diseases such as COVID-19 through behaviour change and communication, lifestyle modifications, hygienic surroundings, etc. For example, building hand-washing facilities in common areas is of no use, if it is not accompanied with sensitisation of the communities and behaviour reinforcement. Schools can play an important role in inculcating healthy habits among the children. Health care workforce, community volunteers, ULBs, anti-COVID-19 squad along with NGOs can play a significant role in sensitising the remotely located vulnerable population, especially the urban slums and peri-urban communities.

h) COVID-19 Healing Centres: Healing centres can be established for mild-to-moderate COVID-19 cases, in the local areas (especially for those patients who cannot observe self-isolation at home). These centres can provide self-isolation facilities along with food and symptomatic medical care, and if possible, mental health counselling. These centres can be supervised by ULBs along with local health workforce and wherever feasible, community-based institutions such as area and cluster-level federations under National Urban Livelihood Mission.

i) Emergency response: A critical component of emergency response services

is ambulance service delivery which must be focused upon to ensure immediate care and subsequently to annul mortality. In order to improve the effectiveness of ambulatory services, they should be steered by local authorities.

IV. Strong and Coordinated Waste Management Mechanism

India faces an urban waste management crisis which has worsened due to the pandemic. Tonnes of biomedical waste such as PPE kits, masks, gloves, testing kits, etc needs to be disposed properly at engineered landfill sites. Most of the existing waste management plants in urban areas were already burdened before the COVID-19 crisis. There is an urgent need to strengthen the waste management services in the cities. Urban departments of states and municipal actors need to reinvent their existing systems of waste management with focus on segregation at source into three components: wet, dry and household hazardous waste including PPEs to reduces mobility and improve the health and hygiene of citizens and to contain the spread of disease outbreak. Cities such as Panchgani, Thiruvananthapuram and Vijaywada have effectively addressed the concern.

V. Graceful burial - A Universal Right

Under the Fundamental Rights enshrined in our Constitution, human dignity is a core value. However, the pandemic has brought to attention many incidences of inhumane behaviour to the mortal remains of the patients who died due to COVID-19. The Central and the State Governments along with local civic bodies must make proper provision and strictly monitor the handling and dignified burial of the deceased, following the COVID-19 Guidelines on Dead Body Management issued by MoHFW.

VI. Tackling Urban Poverty

1. Inclusive Urban Planning and Slum Rehabilitation: The plight of migrant workers and exodus from Indian cities has two very important lessons for urban planning. Migrants are mostly considered as burdens on cities and blamed for the strained infrastructure and services. In reality, they are a crucial productive force and contributors to the success of the cities. This pandemic provided great learnings to utilise it as an opportunity to make our urban city plan more inclusive and resilient, helping urban poor to not only survive the health crisis, but thrive in the post-COVID world. The Government of India has announced Affordable Rental Housing Scheme for migrant workers and urban poor, to provide ease of living at affordable rent. This is proposed to done by converting Government funded houses in the cities into Affordable Rental Housing Complexes (ARHC). However, the design efficiency, affordability and adequacy need to be addressed. Government must also work to improve access to education, public health, safety, and economic opportunity for all.

2. Improving Life in Rural Areas: In order to reduce urban poverty. the Government should take steps to promote income generating opportunities in the rural areas and boosting rural economy. This is discussed in more details in the article under Section C "Rural Areas".

Small and Medium-Sized Cities

Over a period of time, rural villages have grown to acquire characteristics of urban areas. Small and medium sized cities are no longer just towns in the vicinity of large metropolitan cities. Thus, allowing these small and medium towns to become centres for growth has created demand of new services due to the proximity to rural areas. COVID -19 was an urban crisis in the initial phase and bigger metropolitan cities like Bangalore and Mumbai were receiving much attention with the resources redirected towards testing, ventilators and hospital beds. However, it has had a differential impact on smaller towns and cities bursting with return migrants who are finding it hard to cope with increased demands on their physical and social infrastructures. This along with those in slums and informal settlements who have been unable to quarantine themselves, or maintain social distancing. With historically poor investment in infrastructure, planning and governance, second as well as third tier cities along with towns in India are going to pay a higher cost being unequal partners in India's urbanisation. Poor water supply, public sanitation, education and healthcare infrastructures combined with local governance deficits make them hotspots of infectious diseases. It is true that the number of those infected are low in smaller cities now, but this may be because of low testing levels in these cities.

With a steady expansion of urban areas in India; small cities and towns have become a centre of growth attracting a large number of people. A wider pattern of urbanisation has led to the emergence of smaller cities in the country. By 2050, the urban population is expected to surpass 850 million, with 50 per cent of the population living in the cities. This necessitates strengthening medium and small cities that can also serve as economic engines of growth, and creating suitable employment opportunities, along with adequate health care infrastructure, to cater to the needs of the urban as well as rural population.

Key Focus Areas

I. Strengthening of Health Care Infrastructure and Services

Medium-to-small-sized cities and towns suffer due to inadequate health facilities and poor infrastructure. Most of the Government-run hospitals and centres are in pitiable condition. National Urban Health Mission is yet to take off properly in these cities. Tier-II cities have largely remained below the radar of private sector, especially health care. Presently, the health care in these cities are largely dominated by doctor-owned small to mid-sized centres/nursing homes, offering a few basic specialties. Availability of medical care is further skewed by absence of good quality tertiary health care in most small cities. Quite often, people practicing medicine in smaller Indian cities and towns are unqualified health practitioners, under whose care patients are more likely to suffer than get well. COVID-19 crisis has shed a light on fault lines in our health care system where we don't have adequate health infrastructure (both public and private), including a low number of health care workforce to effectively handle the situation on war-footing.

For immediate management of the current crisis, the Government should deploy additional health workforce, ramp up the COVID-19 health facilities including roping the private health care sector. It is advisable to capacitate unemployed youths, SHGs, NGOs/CSO and form an anti-COVID-19 squad (as mentioned earlier), in awareness building and effective monitoring of the situation on the ground.

Ensuring universal access to health care as well as to effectively handle a crisis like this requires long-term sustainable solutions. The Government needs to invest in building and strengthening the public health care infrastructure in tier II and III cities, which should reinforce all the three pillars of health system (primary, secondary and tertiary), through existing schemes of the Government such as NUHM, Ayushman Bharat, and Health and Wellness Centres (HWCs). The concept of HWCs if implemented effectively, has a huge potential to strengthen primary health delivery system in the cities. This will help harness the support of local communities as well as CSOs in decision-making, planning and monitoring of the health programmes. This in turn will ensure better accountability and community ownership.

Private group of hospitals have been focused on increasing profits and footfalls, and are thus, present in more numbers in larger or metropolitan cities; as compared to smaller towns and cities. It will be a win-win proposition for all in case these groups were to reach out to the untapped smaller markets outside the six metros. This will not be without profits in case the private investors and government sectors were to head towards smaller towns and cities, or tier II cities where there is substantial population. The saturation of space and market has also led to the mushrooming of large scale multi-specialty hospitals all over the metros. Thus, the role of the private healthcare sector cannot be understated.

II. Participatory Urban Planning and Governance

The inadequacy and poor quality of physical infrastructure, for example, hygiene and sanitation, transport, electricity, and inadequate access to health care; has been a long-standing challenge in tier II and III cities. It shows poor urban planning and governance. As described in the previous section, rather than being run by States, if local self-governments (Nagar Palikas) of the cities are empowered and made responsive along with active involvement of local citizens; urban planning management will be more effective and sustainable.

Irony of Smart Cities – Jalandhar & Shimla

Jalandhar, a second-tier city, was recently added to the list of India's list of 100 smart cities. But its inequalities go beyond the current lack of preparedness to face the COVID-19 crisis and therefore, the impact of COVID-19 will be unequally experienced by smaller cities like Jalandhar. Thousands of internal migrants and NRIs have returned to Jalandhar in the last few months, some potentially carrying the virus but without effective quarantine measures in place. The public health infrastructure of Jalandhar is in a dismal situation where a Civil Hospital has a 4 bed ICU and seven ventilators for tackling COVID-19 crisis, for a population of more than 8 lakhs .

A hillside town, **Shimla**, was also added to India's 100 Smart Cities programme, but is yet to build a fully functioning ICCC. It has a sizeable ageing population vulnerable to COVID-19 infection, but it also has a relatively weak healthcare infrastructure. Circular migrants from across the Himachal region are returning home to Shimla, while coolies in Shimla are making their way back to their native land in Kashmir. As the paths of incoming and outgoing migrants cross along the Shimla tracts, it is almost certain that the virus is being transmitted and carried further along. Further, the tourist economy in Shimla which only lasts a few months each summer is now devastated. This has put enormous stress on small businesses, their workers and an entire informal economy built around the tourist season.

The capacity for planning and management, including handling of disease outbreaks or disasters, adequate finances should be backed by, and rest with the urban local bodies. The Government of India can provide strategic leadership, whereas the State governments need to play an important role not only in providing an enabling environment through legislative and institutional reform, but also handling the transferring functions, funds, and functionaries.

There is a need to promote decentralised planning through a network of medium and small cities to bring a real change for a sustainable tomorrow. It may positively impact the urban structure in India, which is acutely skewed towards big cities, by investing in towns and cities, to create a potential for employment in the rural hinterlands and make growth more balanced.

To sum it up, it is imperative to adequately invest in urban public health systems, promote programmes that improve the livelihoods of vulnerable communities, as well as strengthen the capacities of the local government in order to tackle COVID-19 or other similar crisis effectively in small cities. The programmes such as the National Urban Livelihoods Mission and National Urban Health Mission, which have lately received limited focus and resources, need to be strengthened.

Photo credit-UNICEf_VinayPanjwani

Rural Areas

The COVID-19 pandemic has created extremely challenging situation for the rural areas of our country due to the substandard infrastructure, poor connectivity, lack of basic amenities, weak surveillance system, and above all, dismal health care system. The impact of this pandemic, and especially the lockdown strategy, has been multi-dimensional with millions of migrant workers marching back to their homes. This further exacerbated the problem by increasing the chance of spread of disease to these areas. It has also increased the pressure on public health services in rural areas. The challenge becomes even more visible when some of the basic sanitation indicators (which comprise the preventive pillars of COVID-19) in rural areas are scrutinised. More than 60 per cent households in rural areas of Bihar, Madhya Pradesh, Jharkhand, Chhattisgarh and Odisha do not have access to water and soap. These are also the States which are the major destinations of returnee migrants.

The pandemic must be perceived as a wake-up call, to revamp and strengthen rural healthcare system for delivering universal health care, as well as to handle future outbreaks effectively and timely. Issues such as infrastructural bottlenecks, inter departmental coordination, huge population in rural areas, untrained staff in patient care and management during an outbreak of infectious diseases, as well as a massive shortage of beds and equipment must be kept in mind, while preparing comprehensive rural health plans.

Opportunities for Transformative Change in Times of Crisis

Reflecting the post Ebola crisis, COVID-19 too provides opportunities to reverse the longstanding inequalities and biases, possible especially by supporting effective and responsive decentralised service delivery. As per a recent United Nations Development Programme study, living standards in Sierra Leone improved faster between 2013 and 2016, than in 70 other poor countries, despite the occurrence of Ebola epidemic during the same time period. COVID-19 could inspire similar efforts, provided transformative actions and initiatives are taken, especially focusing on the rural areas. The key focus should be around improving access to health care services, decentralised governance supporting rural economy, digital infrastructure and accessibility.

Revamping Rural Health Care System

Despite the Government's commitment through National Health Policy as well as health care programmes including the National Health Mission, Ayushman Bharat and HWCs, universal and affordable healthcare is still a distant dream. The health care system in India is still developing and continues to face challenges of inadequate human resources, poor infrastructure and quality of services, especially visible in rural health care. These gaps have become more apparent in the current health crisis.

Rural areas are predominantly dependent on Government health care system. However, the available health care system appears to be ill-prepared and inefficient to contain COVID-19 transmission in the rural areas. This is especially prevalent in many northern Indian States because of problems such as shortage of staff, beds and medical equipments.

Health care services are quite distant for many villages in several districts, especially remote ones. This is coupled with a lack of transportation in rugged terrains that may exclude many from seeking timely COVID-19 testing and treatment. A recent study conducted by the researchers at Centre for Policy Research (CPR), in New Delhi reveals that at least two of every three doctors in rural India are informal providers of care, with no qualifications in the modern system of medicine. According to World Health Organisation (WHO) report "The Health Workforce in India", 57.3 per cent of the allopathic doctors in the country have no medical qualifications.

According to the Census of India 2011, rural population is comparatively older, placing them at a higher risk of contracting the COVID-19 infection. They also live much farther from hospitals than their urban or suburban counterparts, and a majority of them have no access to good medical care. As the current pandemic has stretched an already overburdened medical infrastructure, other healthcare services such as reproductive and child health, healthcare for the elderly along with other curative services have taken a backseat.

Clearly, there is a dire and urgent need to strengthen the health care delivery system of rural India.

Strengthening National Rural Health Mission

The pandemic presents an opportunity to realise the true potential of the existing National Rural Health Mission (NRHM) and seriously revisit its budget allocation. Efforts against COVID-19 should be expedited under the broad objectives of NRHM, to strategically strengthen the health infrastructure and service delivery mechanism, along with the recent initiatives of Government such as Ayushman Bharat and HWCs.

At the face of these multidimensional and diverse challenges, a multi-targeted strategy could be prepared to gradually transform India's rural health care.

• Investments must be made in training the rural healthcare providers, for future disease outbreaks. This could include providing them with clinical guidelines, interactive training sessions and hand holding support.

• Creation of a decentralised, yet strong surveillance system.

Further, the COVID-19 response design can be studied as a two-fold arrangement consisting of preventive care and medical treatment. Preventive care will be based on behavioural change and communication, grassroot tracking and tracing for effective management of COVID-19. For medical treatment, strategies should be developed for various levels, starting with HWCs, followed by PHCs and CHCs linking with District hospital.

Since more than 12 per cent of India's rural population have access to PHCs or outreach health service delivery points, there is a need to rapidly develop a robust two-way referral system from PHCs to CHCs/rural hospitals, as well as the nearest COVID-19 testing and treatment facilities, as envisioned under Ayushman Bharat and HWCs programme. Prioritising well-functioning HWCs in rural areas can ensure seamless healthcare availability.

At the CHC level, the strategy may include clustering and increased coordination among four-five CHCs/rural hospitals accessible by road, to strengthen testing outreach, with one of them being the COVID-19 testing node. Arrangements of testing kits, reagents and associated equipment for such CHCs identified for the purpose, will be in interest of better management of COVID-19 in rural areas.

Training of health personnel in CHCs needs to be provided at the nearest COVID-19 testing centres. The rural population will greatly benefit if a vehicle from the nodal COVID-19 CHCs could visit the nearby PHCs/villages for pre-defined timings on fixed days of the week, to collect samples for RT-PCR tests, as well as to provide timely care to mild-to-moderate cases. There needs to be a proper referral and COVID-19 reporting mechanism in place between PHCs and CHCs, about the testing day and time so that the contacts of confirmed cases and suspected COVID-19 cases can be referred efficiently.

Behavioural Change and Communication

Rural areas are highly prone to misinformation about COVID-19 with many potentially harmful recommendations, such

crisis has once again re-emphasised the importance of decentralised governance. The panchayat represents the quintessential community. As per a number of opinion survey, local communities have a comparatively higher trust in their local governments and thus, are most likely to approach them, rather than other officials for their needs. Appropriate local representation in planning and coordination efforts provides an opportunity for true state-local and citizen action, particularly in times of crisis.

The trust developed by PRIs and local leaders will be able to test, trace and treat the patients and thus contain the crisis effectively. It will also reduce the stigma and discrimination related to it. Community-level engagement and dissemination of information are easier tasks, than deploying resources from the State level.

Additionally, for tracing individuals who have crossed states or districts, it is imperative to have coordination efforts continuing till the last mile, with panchayats being the eyes and ears on the entry as well as exit of individuals and families, especially during community quarantine. With 2.6 lakh rural local bodies (or gram panchayats) and over 10 lakh frontline functionaries (ASHAs, ANMs etc), they can play a vital role in ensuring that welfare services get delivered on the ground level, and no person is left behind from accessing relief packages for want of documentation, or lack of knowledge.

Boosting Rural Economy and Food Production

While COVID-19 has disrupted the food supply chain, there is a silver lining as it simultaneously presents rural income generation opportunities. Export restrictions imposed by some countries to protect domestic food supplies can lower food availability and raise prices in import dependent low-income countries.

However, this is also an opportunity to ramp up local food production, including homestead gardening, to boost food and nutrition security. To further stimulate local food production during the crisis, seed distribution and agricultural extension is more essential than ever before. Information and communications technologies (ICT) can disseminate information and facilitate payments and logistics, but are often insufficiently available in rural areas. Subsidised data plans and training on their use may help. Radio programming also remains central for providing agriculture, nutrition, and health information in many developing countries, proven effective in times of crisis. Efforts must be made to promote small and medium scale industries in rural areas, as well as promoting other income-generating opportunities. Strengthening farm and non-farm livelihoods can pave the way for food and nutritional security, which can be effective in fighting the pandemic and ensuring a robust rural economy. More investment into basic services in rural areas, such as health care, education and skills development, could be the long-term solution to issues related to economic distribution.

Conclusion

Preparation and response to the current health emergency on war footing is of paramount importance. However, it is a huge task for a country with a large population and without a strong health-care system.

While in the long term, improving the national health-care system with increased budget allocation for health is the way forward, immediate fund allocation and action to effectively revamp health infrastructure with decentralised planning and governance, is the need of the hour with multi-stakeholder participation.

Towards Holistic Health Care in India

In the past, several major recommendations by the Independent Commission, such as first comprehensive report of the Commission which was presented to then Prime Minister, Atal Bihari Vajpayee, were incorporated in various Government programmes. This led to many significant policy changes, such as setting up of National Rural Health Mission to overhaul the rural health.

There have been numerous positive developments in the health sector, including Swachh Bharat Abhiyan, Beti Bachao, a new National Health Policy, resolve to eliminate Tuberculosis, Malaria and HIV/AIDS and of course, important steps to curb the use of tobacco products in the last two decades. Thankfully, there is renewed political interest in effectively tackling health related issues, both at the Centre and at the States with launch of recent Government's initiative such as Health & Wellness Centres under AYUSHMAN BHARAT programme and Aspirational Districts Programme.

Sadly, India still ranks poorly in the global health index. In Reproductive Child Health, 15 per cent of the global maternal deaths

Photo source- Health and Wellness Centers

and 20 per cent of child deaths occur in India. Even our neighbours, Bangladesh and Nepal, are doing better than us. The story is almost similar in nutrition front, where many decades of various interventions are not making effective dent. The latest UNICEF survey ranks India as the 12th worst country among 52 low and middle income nations; based on the number of children who die in the first month of birth. There are many reasons for this, but high on the list are underweight babies. The situation is equally grim in the Communicable Diseases front, and is further complicated by significant rise in the cases of chronic diseases. In countries such as India, while the current COVID-19 crisis has revealed deep fault lines within the health system and its linkages with other development sectors, it also provides an opportunity to calibrate the much-needed people-centric and adaptive reforms across the health system.

It is important to clarify at the outset that for a generalising mind, India can be a notorious quick sand. Analysis of qualitative and quantitative data clearly shows extremely uneven health and development progress in various parts of our country. Often, these differences are so dramatic that one can hardly believe that they are part of the same nation, and have followed the same development path for the last seven decades. Even within the States which are doing reasonably well, there remain numerous grey areas. The States which are doing well usually have a robust public health sector, good governance mechanism, reasonable financial allocation, active public participation, and of course better socio-economic indicators. In these States, the private sector play a limited role under reasonable regulations. And there is encouragement for non-profit sector to provide health services for the unreached. Perhaps this is the basic recipe for success

in most countries of the world, where health sectors are doing reasonably well.

The need of the hour is to learn from the well performing States such as Kerala or Tamil Nadu, in addressing the critical issues of health care of States, which are not being able to meet the expectations. We must also deeply internalise that health is a State subject and it cannot continue to be dominated by top down approach from the Centre. Recently, many States have done significant innovations in their existing programmes with good outcomes. Unfortunately, there is no active national forum where the cumulative knowledge of the States can be shared, or technical expertise gained by the States becomes easily available as a national resource. For example, Kerala has a decentralised governance which ensures active community participation, along with good health infrastructure and efficient service delivery mechanism. It offers a good example to the rest of India and the world, in tackling public health emergency such as the current COVID-19 crisis, or outbreak of Nipah virus. An active national forum will help in the horizontal learnings and experience sharing among the States.

While re-looking at the role of Public Sector, we should keep in mind the impressive role they played in combating HIV/AIDS, elimination of Leprosy and revamping the health services for remote border areas, through Public-Non-profit Partnership. In all these instances, stakeholders, community based organisations and NGOs were active partners of the States. To bring holistic change in the health care, the =system requires high degree of coordination and systematic efforts collectively by the Government, private players, along with not-for-profit sector with active community ownership.

The overall health care system in the country needs transformation, if we have to move towards a holistic health care system which is equitable and non-exploitative. Health care system has to be removed from the market framework, and needs to become a public good through a public health legislation. Once this happens, a NHS kind of health care system can be evolved, wherein the private health sector would be socialised, and become an integral part of a health care system.

Healthcare is traditionally seen as a social sector in India, with less government focus and low budget allocation. Inadequate resources have continued to plague our health system for many years. We have just begun to look at the possibility of generating additional revenue for health by taxing demerit goods like tobacco, junk food, and of course additional excise duty on alcohol by the States. India has also voiced the need to invest in primary healthcare, but the budgetary allowances have not kept pace with the commitments as per the National Health Policy 2017. The health policy does talk about strengthening primary healthcare via Health and Wellness Centres (HWCs) that would provide comprehensive primary healthcare, but unfortunately budgetary allocations have not been made in line with the policy and recent developments. This course needs to be pursued vigorously, so that our health budget meets the norms of at least a developing economy, and are able to handle a public health emergency like COVID-19 without compromising and cutting the allocated budgets for other important health programmes. We must inculcate at all levels of the Government that financing the health of healthcare is an investment, not expenditure.

There is an alarming shortage of human resources in health care at all levels from super specialists to the lowest health workers.

India is one of the 83 countries which do not meet the requirement of having a health care workforce of 22.8 per 10,000 people The country has 15.8 skilled health professionals, making it worse than Sri Lanka (24.5), Thailand (17.4) and South Africa (43.3). Many deliberations have taken place on how to address this. We need to move forward proactively to implement this as a policy.

As floated by the Ministry of Health & Family Welfare, we feel an All India Health Cadre should be initiated. This will ensure that well trained Public Health professionals are available, to improve the public health aspects of the health services in the country. It will also strengthen the relationship of the health infrastructure with the communities and stakeholders, so that they can contribute towards the improvement of the outcome. Tamil Nadu is an example of the benefits of this step. Presently the professionals who are in Central Health Services do not have much of a clue on rural health, or public health deliverables.

It is also important to ensure that the doctors recruited for the HWCs/PHCs and CHCs, as well as District Hospitals go through rigorous orientation and training, before they join their duties. A fresher from a Medical College usually does not have clear understanding of functioning of these institutions, as well as the national health priorities that they are supposed to address during their posting. National Institute of Health & Family Welfare can be revamped to train All India Health Cadres at the Centre and the State Institutes of Health & Family Welfare, and can play a similar role for the orientation and training of the doctors at the State level.
Apart from training of the health staff, it is also important to introduce a basic training

on health for other important non-health departments, and their officials, so that they are able to handle a public health emergency like COVID-19, or other disasters in a more effective and efficient way.

Despite the Government's commitment through National Health Policy, health care programmes including National Health Mission, Ayushman Bharat and Health & Wellness Centres, equitable and affordable healthcare is still a distant dream. The healthcare system in India is in dismal state, and continues to face challenges of poor infrastructure and quality of services. These gaps have become more apparent in the current health crisis.

Setting up of many new AIIMS may not be the answer, but what is more relevant is to upgrade and upscale the credible existing training facilities all over the country. There is a strong need to strengthen and upgrade the health care infrastructure including Health & Wellness Centres as per the Indian Public Health Standards norms, both in the urban and rural areas. This should be accompanied with decentralised planning and governance with active participation of local communities and stakeholders, in order to ensure effective management and transparency in the system. This will also help enhance the local capacity. The creation of mobile dispensary, ambulatory services, as well as tele-health can further strengthen the outreach between health institutions and people needing the services. These are also opportunities of cost-cutting without compromising the quality of care.

At present, our health systems remains more data driven, rather than action oriented. There are several health information systems which are functioning in parallel, without horizontal

integration. It is pertinent to have an integrated flow of information into a single portal, also ensuring use of the health information as an effective management tool for local action.

The declarations to eliminate TB, Malaria and HIV/AIDS are welcome political commitments. However, given the huge and complex task involved, we need to revisit the programmes and learn from our past track record. One major cause of concern is limited use of Health Management Information System as a proactive management tool in these programmes. There is also inadequate linkage between the research institutions and the implementation wing. The HIV/AIDS programme seem to be losing steam, due to shortage of resources and dwindling political commitment.

Recently released mortality report of State level burden of Non-Communicable Diseases clearly shows the looming threat of Non-Communicable Diseases, in all the States of India. We are yet to begin systematic work in this front. As important as it is to diagnose people with Non-communicable Diseases, we need a holistic plan at the same time to prevent such a situation from occurring by implementing active health promotion activities, particularly with the young population in mind. The current budget for Non-Communicable Diseases is almost an apology, and there needs to be a many fold increase for us to be effective. We have seen with considerable appreciation how Government, non-government organisations and local communities played a significant collaborative role in reducing the risk of tobacco consumption, with active Tobacco Control work. We are yet to effectively grapple with problems of Mental Health, Accidents, Trauma, Dental and Eye Care.

An area of major concern is environmental degradation. Pollution levels in most of our major cities have reached alarming proportions, and we are just waking up to this major health threat. Almost half of our urban population does not have basic civic amenities. In the name of industrialisation and development of our backward areas, we are polluting the limited sources of safe drinking water of local communities. The indiscriminate use of pesticides is a cause of serious long-term worry. Public places and even the holiest rivers of this country are fast turning into garbage dumps. Effective implementation of Swachh Bharat Abhiyan can go a long way in addressing many of these concerns. We have almost forty crore people living in urban settings in India. But unfortunately, the Urban Health Mission is yet to effectively begin its work at a large scale. It might be worthwhile to look at some of the recent experiments being done by the States.

We have to look beyond the so-called predominantly reductionist bio-medical model of health care, to a holistic model of health care which puts the human being in the centre. In the recent years, effort has been made to mainstream Indian Systems of Medicine, but the integration remains incomplete due to absence of healthy inter-disciplinary dialogue between AYUSH and Allopathic systems, and lacking efforts to nurture the local health traditions.

Although there are a plethora of Health Research Institutions in India, there is little synergy between them. There is also limited role of these institutions in formulation of major health policies and programmes. Can we look at the possibility of merging some of these institutions and providing them with adequate budget, infrastructure and human

resources, particularly to address the key national health issues?

The current crisis calls for the creation of a sound legal structure/reforms to replace the antiquated Epidemic Disease Act of 1897, which will help to deal more effectively with public health emergency, especially pandemics of the scale of COVID-19. In this situation, the draft National Health Bill (2009) is a beacon of hope, for it embraces all the tenets of health and health care, including the underlying factors and hope to aspire towards the aim of 'Health for All'. It is also important that the Government should give due credence to the Right to Health, and treat it as an inextricable part of the fundamental Right to Life.

There has been broad consensus within the country that the challenges of health and development cannot be met without community ownership & and active involvement of CBOs, NGOs and other important stakeholders. This is very much reflected in the Prime Minister's motto of 'Sabka Saath, Sabka Vikas' as well as Government of India's National Health Mission, which lays considerable emphasis on the role of Village Health & Sanitation Committees (VHSNCs).

However, to translate this theoretical framework into practice, we need to combine scientific planning, reflecting on the hopes and desires of the community. In order to ensure long-term sustainability of the existing programmes, health systems and health functionaries should adopt a community and stakeholders linked roadmap. Following this roadmap also ensures that the community's local knowledge enriches the content of the programme in the local context, thus promoting community ownership of the health programmes.

According to Mythology, in Mahabharat, Yudhishtir was asked a final question by *Dharma*, before he qualified to enter the Heaven:

लाभानां मुक्तमं किम
(What is the greatest gift of God?)
लाभानां श्रेय आरोग्यम्
(He correctly replied, the greatest gift of God is good health.)

Unfortunately, we are yet to actualise this aspiration, despite many decades of planned efforts. Often, this process has been disrupted by sudden onslaught of hybrid ideas of selected primary health care, or obsession with a specific disease, sometimes by aggressive family planning programmes, and of course continuous donor driven initiatives which often advocates an approach which leads to a situation where "operation is successful, but the patient is dead".

After so many years of such varied experiences, the time has come for us to make it possible to steadfastly stick to a holistic and sustainable health care system, which can transform India to a healthy nation. We need to have the conviction that health is a key instrument for economic and social growth, and if we continue to neglect it, it will put the nation's future at a grave risk.

Photo Source -PTI

Snapshots from the States

While the COVID-19 pandemic has spread all across India, governments at various levels and states in India have acted in varying ways, to strengthen individual efforts and protect the citizens. However, COVID-19 has overwhelmed the already overburdened healthcare system in India. The pattern of COVID-19 spread in India has been varied and complex, with marked differences across states. The health systems of almost all states faced extreme distress, the silent victims being the non-COVID-19 services such as RMNCH+A, tuberculosis programme and routine vaccination. The current unit provides a snapshot of the strategies adopted by some of the states from across the country, their early approaches, and the impact of COVID-19 on other health priorities in the states.

UTTAR PRADESH

Overview

Uttar Pradesh (U.P.) is the largest state in the country in terms of population and hence, the battle against COVID-19 becomes more challenging. The first case in the state was reported on 4 March 2020 in Ghaziabad, more than a month later than the first national case.

As of 31 October 2020, Uttar Pradesh confirmed 4,81,863 COVID-19 cases which included 7,025 deaths and 4,51,070 recoveries. The case fatality rate as per this data was 1.45 per cent. Compared to this, India at the same time had 8,137,119 confirmed cases and 121,641 deaths, leading to a case fatality rate of 1.49 per cent.

Strategies Adopted by Uttar Pradesh to Contain the Outbreak

As soon as the first case was reported in

Uttar Pradesh, the State Government started formulating rapid strategies to mobilise resources, through a planned approach. This response is two-fold. On one hand, containment measures were taken to curb the spread of the disease, and on the other hand relief measures were laid out to cushion the harsh impact of containment interventions.

Pre-lockdown Situation

As mentioned earlier, the proceedings for the prevention of pandemic outbreak started in the first week of March 2020, almost 3 weeks before the first lockdown was announced on 25 March 2020.

Special training programs for frontline workers, including the medical professionals and police personnel, were initiated. The rural and urban development departments, as well as panchayats were directed to conduct comprehensive awareness programmes. Through a Chief Minister Helpline number,

the village heads were asked to make villagers aware of the threat of the new virus. The state government issued advisories about the do's & don'ts, and tips to stay healthy during this time.

Even before the national lockdown, the State Government in Uttar Pradesh ordered a shutdown of all places of public gathering, such as educational institutions, cinemas, shopping malls, swimming pools, gyms, multiplexes, and tourist spots till 2 April 2020. Public transport was put on hold, and it was ensured that nobody roamed the streets. A helpline was started to assist the public regarding the information about the outbreak. The public was advised to postpone all family events and celebrations such as weddings. For any gathering, prior approval had to be taken from the district authority. On 21 March 2020, the Chief Minister ordered lockdown for next four days, in 15 districts of the State where cases had started to appear in significant numbers.

Post-lockdown: The Agra Containment Model

Soon after the national lockdown was declared by the Prime Minister, Agra emerged as the first COVID-19 cluster in India. However, the strategy and response adopted by the district authorities in Agra initially seemed so successful that it was praised by the Central Government and came to be known as the Agra Model. The Agra Model was a containment strategy which included the following:

1. Identifying areas within 3 km of the epicentre as 'Containment Zones'. Over 1,200 teams conducted door-to-door surveys of 9.3 lakh people:
   a) Integrated Control and Command Centre (ICCC) of Agra Smart City, built under Smart City Mission were converted into COVID-19 War Room for Agra District.
   b) Central helpline numbers were set up for the District.
   c) Multifunctional District teams were set up for centralised and coordinated response management.
   d) Teams from SSP Police and SP Traffic managed lockdown and clustering.
2. Monitoring the movement of infected people by drones, CCTV cameras, and mobile phone GPS.
3. Active contact tracing and isolation and medical facility along with cluster containment:
   a) Active Public Private Partnership for setting up testing and treatment facilities and isolation centres.
   b) Inspection of facilities by District Magistrate and city officials.
   c) Identification of critical hotspots and clusters.
   d) Active survey and containment in identified hotspots managed by city officials.
4. Doorstep distribution chain:
   a) Identification of local food and medical suppliers in every ward.
   b) Set up distribution chain for doorstep delivery to citizens.
   c) E-Pass facility initiated to facilitate movement of essential goods and services during lockdown.
5. Citizen awareness and data-driven response, through a Citizen Self Registry Platform which includes City Safety Messaging. It gave Risk Rating to citizens and accordingly, recommendations. Medium and High Risk people were called to be supported by centralised teams.

The District administration of Agra credited the model's initial success to three key points: a) isolation; b) expansion; and, c) containment.

However, the model saw a V-shaped growth - while it was considered successful initially, by May 2020, reports of uncontrolled spread and high death rates started pouring in. The administration and doctors related it with the city's location near the national capital Delhi, along with other States including Rajasthan and Haryana, as well as patients coming in late from other smaller towns of Uttar Pradesh.

By July 2020, the model regained popularity. While on 5 May 2020, the COVID-19 positive cases doubled in just 15 days, the next doubling of positive cases took 60 days. As of July 2020, there was a positivity rate of 3.04 percent in the samples taken, which was considerably lower than other districts in the country. District Magistrate reflected that earlier, the delay in getting confirmed reports from Lucknow and Pune took a long time, and the infection chain could not be broken in time due to the delay. This was solved by local testing of samples and pool sampling. Secondly, quarantine centres were spreading the infection, so the strategy was changed, and the asymptomatic positive cases were kept in home quarantine. Also, the administration arranged for more medical staff to be trained in COVID-19 management, which brought down the cases of health workers getting infected by the virus, and ultimately resulted in a drop in infection rate in Agra.

Impact of COVID-19 on Public Health Programmes

As COVID-19 demanded the highest priority of heath workers and the public health system for itself, other regular public health programmes bore the impact. Here we briefly look at the condition and challenges faced by some of the most critical public health areas.

1.   Routine Immunisation Programme

Immunisation services to children (0-5 years) are provided through special campaign and routine immunisation sessions held at fixed sites (healthcare facilities) and outreach sites, i.e. at anganwadi centres in villages. During COVID-19 lockdown period of more than two months, routine immunisation services, mainly outreach sessions, have been partially or fully suspended in Uttar Pradesh, leaving large number of missed children and dropouts. Travel restrictions during nationwide lockdown on one hand limited the movement of health workers and caregivers, and on the other hand interrupted the vaccine and logistics supply.

Status of Immunisation Programme in UP (April-May 2020)

- Child immunisation programme was the worst hit with potentially lifelong impact on children.
- Number of immunisation sessions held came down sharply by 64 per cent in April 2020, versus January 2020.
- BCG vaccination dropped 50 per cent in April 2020, as against January 2020 and 42 per cent in April 2020, as against March 2020.
- Oral Polio (first dose at birth) dropped to 39 per cent in April 2020, as against January 2020.
- Pentavalent vaccination dropped to 68 per cent in April 2020, as against January 2020.
- 69 per cent children missed their Rotavirus vaccination in April 2020, versus January 2020.
- 72 per cent children missed their Measles, Mumps, Rubella (MMR) vaccination in April 2020, versus January 2020.

Although post-lockdown, immunisation services were resumed, but the impact

District Coordinator, Lalitpur, U.P., interacting with District Immunisation Officer Dr. Hussain Khan to get an overview of immunisation during COVID-19

> Due to COVID-19 lockdown we were not able to conduct immunisation sessions, but post-lockdown we have started conducting immunisation sessions and following social distancing norms. In addition to this, we are also trying to track migrant children to avoid further drop out.
>
> **Dr. Hussain Khan, District Immunisation Officer, District Lalitpur, U.P.**

of lockdown was so intense that children missed many crucial vaccines. Post-lockdown planning of immunisation session included a huge backlog.

Obstacles to Immunisation Coverage Arising from COVID-19

- The perception of health clinics as 'hotspots' for COVID-19 activity has seen fewer parents visit health centres, to get their children vaccinated.

- Further, difficulty in reaching remote areas is a consistent challenge in immunisation work. With a pandemic at play, reaching vulnerable and remote populations is even more difficult, particularly with limits on travel and mobility. Lack of transportation during lockdown has posed a problem in conducting outreach sessions.

- The adverse effect of COVID-19 on community mobilisation has reduced community response to immunisation services. Due to COVID-19, community mobilisation for immunisation sessions became a huge challenge for frontline workers, as people were not willing to risk exposure by attending vaccination rounds. Further, reports of attack on health workers engaged in COVID-19 screening and follow-up has also built some unseen barrier between ASHA/AWW and community.

- Increased burden on frontline workers, as they have also been entrusted with

From head to toe we are engaged. We already had so many responsibilities but due to COVID-19 we are assigned with additional duties such as door to door survey and counselling for COVID-19. Therefore, we are not able to focus much on other programmes.

ASHA, District Kannauj, U.P.

We are trying a lot to convince the community to attend immunisation session, but it has the fear of COVID-19. They don't want to put their children at risk. Many people shut doors at our face.

ASHA, District Azamgarh, U.P.

pandemic control activities such as door to door surveys, conducting awareness campaigns among people, overseeing the movement of migrants, sensitisation for social distancing etc. Consequently, ASHA and other community health workers are not able to provide immunisation services to pregnant women, or birth control methods on account of their increased responsibilities towards the pandemic control measures.

- Difficulties faced by community in accessing immunisation services as vaccination services were being provided only at the Primary Health Centres, District Hospitals, medical colleges etc., during lockdown. A situation like this has a direct impact on lowering the immunisation coverage, as people in far flung areas cannot visit the required health facilities because of lockdown and lack of transportation services.

- Lack of information about the services has also put an impact on immunisation coverage. Those who were willing to get their children vaccinated didn't have proper information about the session site.

- Due to migration, there is an increase in left out and drop-out rate. Uttar Pradesh had received almost 32 lakh migrant workers. Children of these migrant workers were already receiving immunisation services in other states, however, after migration due to COVID-19, these children were missed as many didn't have their vaccination cards.

Recommendations of Frontline Workers

- Resumption of routine immunisation service as soon as possible, considering missed immunisation during COVID-19 lockdown and likelihood of Vaccine Preventable Diseases outbreaks (measles, diphtheria & Polio-type-2), if there is prolonged delay in vaccination.

- District/Block health staffs to identify safe and well ventilated session sites, ensure adequate availability, use of personal protective equipment (PPE) along with hand hygiene measures by Frontline Workers as well as caregivers, adopt social distancing by limiting number of caregivers and/or use of token system/queue.

I was in constant distress. I wanted to deliver my child in a hospital but due to lockdown and lack of transportation I was not able to access the public health facility. As a result, I had to deliver my child at home. Although me and my child are safe, my family and I have faced a lot of trouble throughout the pregnancy due to the lockdown.

Savitri, District Lalitpur, U.P.

- The vaccination efforts should concentrate on children who have skipped doses of vaccines during the COVID-19 interruption period, and should give priority to the poorest and most vulnerable children. Frontline Workers need to conduct headcount survey and prepare due list to include new beneficiary (new births and migrants) and missed children during lockdown. Number of revised beneficiary as per due list/micro-plan will help in estimation of vaccine, and logistics requirement at the session site.

- Number of routine immunisation days may be increased or immunisation may suitably be done in many shift to avoid gathering at a time. Immunisation at fixed session site may be promoted.

- For community mobilisation and monitoring, use of mobile calls, or messages may be promoted.

- Instead of 'One-Size-Fits-All' strategy, a 'Tailored based approach' may be followed for containment and buffer zone, beyond buffer zone and green zone. The Districts/Block Immunization Task Force may review the existing situation of COVID-19 in the respective areas, and suggest session planning.

2. Maternal and Child Health Programme

The COVID-19 pandemic and strict lockdown in India affected reproductive services such as maternal health, family planning, and abortion services quite adversely. Although medical facilities were exempt from the lockdown, the curbs on movement as well as fear of infection among patients and health providers resulted in low availability of services. Thereby, it adversely affected the key maternal and child health indicators. It has led to a drop in institutional deliveries, ANC & PNC services, immunisation and Essential New Born Care services.

Impact of COVID-19 Pandemic on Maternal and Child Health Programme

Various modalities used to combat the infection have exacerbated the delays in access to maternal health services (MHS), including the delays in decision making to seek health services, reaching health facilities and getting required care. Overwhelmed health centres, lack of resources and movement restrictions have had a negative impact on the utilisation of MHS. Both demand as well as supply side factors have been affected in terms of use of essential health services. On the supply side, there are concerns of fear of exposure, inadequate PPE, staff being infected

or under quarantine, redeployment and shortage of trained staff, overstretched health infrastructure and personnel, and lack of beds, with many women giving birth at home.

Public health facilities are burdened with patients being treated for COVID-19. Combined with the complete lockdown imposed throughout the country, pregnant women are finding it increasingly difficult to seek care and treatment from health facilities and providers. With many private and small clinics shut, poor utilisation of maternal healthcare services has resulted. Lack of access to maternal health care and the absence of face-to-face interactions with healthcare providers have made pregnant women more prone to stress and depression.

Key Challenges Faced by Community in Receiving Maternal and Child Health Services

- The dread and anxiety of visiting hospitals during COVID-19, has led many women to change their plan of childbirth and they are planning to have home deliveries, thereby decreasing the number of institutional deliveries during the lockdown.

- For those who want to avail the institutional facilities, the lockdown and movement restriction has caused difficulty in reaching health care facilities, mainly due to lack of transportation. Due to this issue, the number of women seeking antenatal and postnatal care has fallen significantly since the lockdown, along with the reduction in institutional deliveries.

- Even the women who managed to reach health facilities have reported not receiving timely care. In some facilities there was a shortage of health care workers, because many were engaged in treating COVID-19 patients, while in other centres maternal health services were curtailed, despite being classified as essential service.

- Additionally, a lack of preparedness of health institutions appears to be another factor that hinders service delivery. With rising number of COVID-19 patients and shortage of PPEs, health workers have been frightened, stressed and demoralised. The lack of adequate PPEs for health workers seems to have affected the quality and quantity of health care.

Status of Designated Microscopy Centres (DMCs) in 6 Implementation Districts (April-June 2020)			
District	**No. of DMC**	**No. of Non-Functional DMCs due to COVID-19**	**% of Non-Functional DMCs due to COVID-19 Lockdown**
Azamgarh	49	24	49%
Chandauli	21	6	29%
Kannauj	19	5	26%
Kaushambi	16	4	25%
Kushinagar	35	23	66%
Lalitpur	11	10	91%
Total	**151**	**72**	**48%**

District	PTBP tested Apr-Jun 2019	PTBP tested Apr-Jun 2020	Difference	% decrease in Testing
Azamgarh	7012	1398	-5614	-80%
Chandauli	5064	666	-4398	-87%
Kannauj	3952	873	-3079	-78%
Kaushambi	3689	319	-3370	-91%
Kushinagar	6005	625	-5380	-90%
Lalitpur	3186	736	-2450	-77%

Some facilities have converted maternity wards to COVID-19 units, in order to accommodate the increasing number of COVID-19 patients. Hospitals also have a shortage of staff in neonatal intensive care units.

Voices from the Field

Dr. Pratap Singh, District TB Officer, District Lalitpur, shared that in Lalitpur, institutional deliveries decreased by 16 per cent during COVID-19 pandemic. Further, the community remained cut off from health services due to closed general OPD for the initial period of lockdown followed by the lack of public transportation throughout the lockdown. As per Dr. Singh, "Now we are trying to put our efforts to strengthen the service delivery. On a regular basis we are trying to keep a track of daily OPD report for ensuring MCH services, ensuring social distancing at CHC/PHC and routine immunisation sites, telephonic medical advice with the help of 20 Public Medical Officers and 6 identified private doctors. We are also regularly monitoring 102/108 Ambulance services during emergency."

3. Tuberculosis Programme

The COVID-19 pandemic has severely impacted reporting of tuberculosis cases in India, with the lockdown, deployment of staff on COVID-19 duties, and lack of access to healthcare; all playing a role in this dip in the numbers. The national lockdown, in response to the COVID-19 pandemic, caused a disruption in TB services. For instance, closed OPD services in both government and private hospitals is expected to cause delay in TB diagnosis. Tuberculosis services have been affected at several levels including diagnosis, drug delivery, patient counselling, and patient follow-ups. It is important to have a look at the district level indicators to understand the current status of TB Program in implementation districts.

Status of Diagnostic Facilities

In the 6 implementation Districts, there are overall 151 Designated Microscopy Centres (DMCs), out of these almost 48 per cent DMCs have remained closed due to which testing has been affected a lot. Due to COVID-19, significant resources are now

being diverted to COVID-19 management such as engagement of lab technicians in COVID-19 testing. Almost 105 lab technicians have remained engaged in COVID-19 testing and screening.

Impact of COVID-19 on Testing

Due to COVID-19, almost half of the DMC have remain closed, as lab technicians were engaged in COVID-19 duty, because of which a sharp decrease has been in observed in April-June 2020 as compared to that of 2019. Another reason reported was shortage of PPE Kits. This factor has brought apprehension among the health care providers regarding risk of exposure to COVID-19, while conducting testing. During lockdown, average decrease of 80 per cent in testing is observed as compared to same month in the last year. Apart from all this, restriction on mobility has also put an impact on testing as patients were finding it difficult to reach facility for testing, even if the patient has the option to go to a healthcare facility; confirming the diagnosis would take time as the facilities have been diverted to COVID-19.

The automated CBNAAT tests that were developed for TB diagnosis have been modified to identify COVID-19, and many more machines have been diverted. Therefore, CBNAAT testing has not been much utilised for TB patients during lockdown.

Status of TB Notification

The diagnosis of new TB cases has seen a dramatic drop since the lockdown, according to the Central TB Nikshay portal of Government of India. The estimated number of the diagnosis of number of new cases of tuberculosis detected as of April-June 2020 in government healthcare centres saw a significant fall to 44,139 compared to 90,908 cases in April-June month of 2019, a 51 per cent decrease.

Closure of out-patient departments (OPD) at various hospitals, poor access to treatment, refusal by government and private hospitals, difficulty in reaching Direct Observed Therapy programme (DOTS) centres by patient and medical staff due to limited transport, have been quoted as reasons for this situation.

Delays in Reporting and Initiation of TB Treatment

Engagement of facility level staff in COVID-19 duty has led to delays in reporting as well. lab technicians and Senior Treatment Supervisor (STS) are engaged in COVID-19 duty and are not able to give much time to their own programme. Complete focus has been shifted to COVID-19 testing. Patients identified are not reported on Nikshaya Portal which has led to delay in treatment initiation also. ASHAs are busy with COVID-19 Duty and are not able to focus on TB treatment services and treatment adherence of TB patients.

Voices of TB Patients and District Level Officials

"Due to fear of COVID-19, I was not able to go to public health facility for receiving medicines. Local medical shops were closed due to lockdown. For one month I didn't have

medicines."- **Shokat Ali, TB patient, District Azamgarh, U.P.**

"From Delhi, I returned to my hometown UP. I tried and somehow managed to approach government facility near my village for receiving treatment, but the staff was not available over there. They referred me to another facility, but staff over there asked me to submit the COVID-19 test report. I moved from one facility to another, but didn't receive medicines." - **Suryaprakash, TB patient, District Kushinagar, U.P.**

"Patients have a fear of COVID-19 and they are reluctant to visit public health facilities. During the lockdown, DMCs were closed as our lab technicians and other staff were engaged in COVID-19 duty. Sputum testing was also hampered. But, it is our duty to ensure that TB patients shall not suffer because of this. Therefore we started focussing on X-rays and initiated treatment of TB patients on the basis of X-ray results." - **Dr S.K. Jha, District TB officer, Kaushambi, U.P.**

Effect of Lockdown on Migrant and Vulnerable Population

Uttar Pradesh received almost 35 lakh migrant labourers from different states across the country. After the migrant labour crisis in Delhi, the Uttar Pradesh Government was the first to announce and bring back its residents. Later, many students stuck in Kota and labourers in other states, like Haryana, were also brought back in buses after completing 14 days' quarantine.

Government of Uttar Pradesh also put efforts to bring back thousands of migrants who were stuck outside the state, due to the lockdown. As part of its endeavour to offer relief to the migrant workers, the Government of Uttar Pradesh launched an online registration facility Jansunwai portal. This portal was for migrant workers from Uttar Pradesh who wanted to return to the state, and for those who were in the state and wanted to return to their native places and could file applications, as well as register complaints.

Most of the workers who have returned, especially those belonging to the SC community, are either landless, or do not own enough land to sustain their families while living in the village. However, they are also aware that in the coming year, and possibly even the next one, there will be no work for them at the places they had left in desperation. Hardly anybody got paid for the period of lockdown and significant number of workers even had pending payments.

Even though the Chief Minister repeatedly announced that people in need will get ration even without a ration card, only a little more than 50 per cent of the migrant workers got their quota of ration. The situation with work under MGNREGA is worse. Less than a third of the people who have returned got work from one to 20 days. But only about a third of them had received payments.

Looking into the situation, the Uttar Pradesh Government has decided to set up a Migration Commission for employment of migrant labourers and in the state. Officials are in-

structed to do skill mapping of migrant workers, so that they can be provided employment once they complete the quarantine period.

Financial Allocation/COVID-19 Relief Measures Announced by the State Government

The Chief Minister of Uttar Pradesh was the first to declare that people need not step out of their homes even for essentials such as groceries and medicines, as these would be delivered to their doorsteps by police personnel and government-appointed delivery agents following all safety precautions. Supply lines were created, and a helpline number was established as the primary emergency number for all purposes. Apart from the Government Helpline numbers, the Government also issued numbers of grocery stores on 25-26 March 2020, which it had enlisted for door-to-door delivery of essentials.

The Uttar Pradesh Government also announced several relief packages, including direct money transfers to bank accounts. A financial package of 395 crores was announced for 3.53 million beneficiaries including registered labourers, rickshaw pullers, hawkers, and kiosk owners. Immediately after the lockdown was announced, the government also started the distribution of cooked meals and dry rations kits through police response vehicles to various areas. Free food grains were distributed for the month of April and May 2020 to 8.38 million widows, senior citizens, and handicapped pensioners.

Further, 16.53 million beneficiaries were provided with a month's free ration and an amount of INR 1,000 was deposited into the bank accounts of 11 lakh construction workers. Apart from this, the Uttar Pradesh Government created a record by distributing 1.5 lakh metric tons of rice to 3 crore people from 75 lakh families in a single day. Being a State whose 80 per cent population is dependent on agriculture, the Chief Minister also announced relief packages for farmers. It being the harvest season, the Government encouraged institutions and agencies to purchase food grains from the growers.

Apart from these humanitarian steps, the Government also focused on the need for continued education and learning of students. Soon after the lockdown was announced, the government ordered the officials to start technology-based online classes for students from primary up to class 12 as well as students of nursing and paramedical studies, so that their academic schedule is not disturbed.

The Uttar Pradesh Government also started broadcasting a 90-minute education program on Doordarshan Uttar Pradesh for the students of classes 1-8. This step is taken to ensure that the students remain associated with learning, and make constructive use of the lockdown period. The Department of Basic Education, Uttar Pradesh also started the E-Paathsaala initiative for students, making the best use of the limited resources available, as there is no certainty regarding the reopening of schools even after the lockdown is over.

Photo Source: The Guardian

BIHAR

The first two cases of the COVID-19 pandemic in the Indian state of Bihar were reported on 22 March 2020, one of whom died the same day. Given the highly contagious nature of the disease, the Government of Bihar immediately announced a state-wide lockdown till March 31. This was quickly followed by a nation-wide lockdown announced by the central government on 24 March 2020. During the lockdown, severe restrictions were placed on the movement of individuals. Establishments remained closed, except those providing essential goods and services.

The pandemic along with Bihar's chronic resource constraints and limited healthcare capacity has placed the state en-route to a major crisis. The pandemic has significantly impacted the prevention and treatment services for communicable, as well as non-communicable diseases in Bihar.

As of 31 October 2020, Bihar had registered 216,764 confirmed cases of COVID-19 and 1,084 deaths. The death rate as per this data is 0.5 per cent, much below the national average.

Initiatives Taken by the Government of Bihar to Tackle COVID-19

The Bihar Government took several measures before the national lockdown was announced, in response to the COVID-19 pandemic.

Pre-lockdown Measures

Screening and limiting mass gatherings: The initial responses from the state government were aimed towards raising awareness about precautionary measures to be taken against the disease and screening of international travellers. In this context, Bihar State Health Society issued advisories in February 2020 for measures to be taken in school and colleges and reporting of airline passengers and tourists

with symptomatic cases to the district health administration. In March 2020, the 104 Call Centre was designated as the COVID-19 control room, to address public queries related to the disease.

To limit mass gatherings, the State Government issued orders to shut down various premises until 31 March 2020. These included Anganwadi centres, educational institutions, and commercial establishments such as cinema halls, parks, and shopping malls. The government staff was directed to come to office on alternate days. Gathering of more than 50 persons at one place was prohibited including any mass family gathering (except marriages). The transport department was asked to restrict both public and private transport.

Healthcare measures: In March 2020, the Government issued directions to:

(i) Availability of 100 extra ventilators in the government hospitals.
(ii) Arrange for testing of COVID-19 in AIIMS, Patna and PMCH, Patna hospitals.
(iii) Cancel leaves of all employees of the health department.
(iv) Strengthen screening of travellers entering through the Bihar-Nepal border.

Further, the Health Department issued The Bihar Epidemic Disease, COVID-19 Regulation 2020, under The Epidemic Disease Act 1897. These regulations specify the protocol to be followed in both private and government hospitals for screening and treatment of COVID-19 patients. It also empowered the District administration to take containment measures, including sealing of specific areas, and conducting surveillance for COVID-19 cases. It made spreading of rumour or unauthenticated information with mala fide intent, a punishable offence.

The State Government also announced that treatment costs for COVID-19 for residents of Bihar would be sponsored from the Chief Minister Medical Assistance Fund. Moreover, the State Government provided assistance of INR 4 lakhs to the family of COVID-19 deceased.

The Government also issued directions to provide direct cash transfer, in place of the food provided under the mid-day meal scheme in schools and at Anganwadi centres.

During Lockdown

Upon announcement of the national lockdown, the state and district level coordination committees were set up. During the lockdown the state government's measures had been aimed towards strengthening the medical response in the state, providing relief to various sections of society from issues being faced during the lockdown, and addressing difficulties with the supply of essential goods and services.

Strengthening the medical response:

- The Health Department constituted the Bihar **COVID-19 Emergency Response Team,** for the control and coordination of all health related responses.

- **Protocols for containment and treatment:** Directions were issued to implement several guidelines related to containment and treatment measures. These included:

a) Set up and operationalisation of isolation centres and quarantine centres.

b) Containment plan to address local transmission and community transmission, through cluster containment strategy.

c) Surveillance program for Influenza-like Illness(ILI) and Severe Acute Respiratory Illness (SARI).

d) Handling of waste generated during treatment/diagnosis/quarantine.

e) Sanitation of residence and nearby areas of a COVID-19 positive person.

• **Door to door screening campaign:** In April 2020, the state government directed to start door to door screening campaign for suspected cases in affected districts including Siwan, Begusarai and Nalanda. Such screening campaigns were also run in districts in border-areas, and an area within 3 km radius of the residence of COVID-19 positive patients.

• **Increasing manpower:** The Government invited medical professionals including doctors, nurses and paramedics to volunteer. It also directed the district administration to engage retired doctors, nurses and paramedics from defence services for volunteer work.

• **Dedicated infrastructure for COVID-19:** In the month of April 2020, certain Government hospitals were designated as exclusive hospitals for treatment of COVID-19 patients. The health department also directed certain big private hospitals in Patna to stop OPD services.

• **Other health related measures:** In March 2020, the State Government announced payment of one month basic salary as an incentive to all doctors, and health workers. In the month of April 2020, the health department issued and order prohibiting spitting in public places by tobacco,

Impact of COVID-19 on Family Planning Services in Bihar		
Family Planning Service	**Apr-Jun 2020-21**	**Apr-Jun 2019-20**
Total Sterilisation Conducted	3,820	37,434
IUCD Insertions done (public facilities)	46,163	82,656
Total PP IUCD Insertions done	29,866	36,414
Combined Oral Pills distributed	1,92,006	2,31,380
Emergency pills distributed	54,923	55,465
Condom pieces distributed	17,40,257	21,12,108
Number of beneficiaries given 1st dose of injectable	15,595	42,201
Pregnancy testing kits used	1,55,555	2,25,680

cigarette, and paan users. Further, the State Government announced that it will procure test kits from the private sector.

Welfare Measures Taken by Government of Bihar

Relief package: In March 2020, the State Government announced a relief package for people affected due to lockdown. Key features of the relief packages were:

(A)   Ration of one month to all ration cardholders for free.

(B)   One time cash transfer of Rs 1000 per family to ration cardholders.

(C)   Payment of pensions for three month in advance to all pensioners including pension for old age persons, widows and physically challenged.

(D)   Release of pending scholarships to all students.

Help for migrants: In March 2020, INR 100 crore was allocated from the Chief Minister relief fund, to provide aid to the migrants from Bihar stuck in other parts of the country due to the lockdown. In the first week of April 2020, the State government announced that a one-time cash transfer of INR 1,000 will be provided to the migrants. By mid-April 2020, an additional INR 50 crore were allocated from the relief fund for this purpose. State wise nodal officers had been appointed for coordination of relief efforts for migrants. The State Government was running 10 food centres in Delhi to help migrants from Bihar.

Relief camps: In the last week of March 2020, the State Government decided to start relief camps along the border (including Nepal border) offering food, shelter and medical help to persons coming in the state. Community kitchens and relief camps had been started in government school campuses, to provide food and shelter.

Electricity tariff: In April 2020, the State Government approved the proposal for reducing electricity tariff for domestic and agricultural consumers by 10 paise per unit, and waiving the monthly meter fee.

Measures for Supporting Businesses and Agricultural Activities

The State Government provided certain relaxations to businesses in matters related to taxation. These include:

i. Extension in the deadline for payment of GST from 31 March to 30 June 2020. No interest or penalty charges to be levied for late payment in certain cases.

ii. Three-month extension in the deadline, for one-time settlement scheme for pre-GST tax disputes.

iii. Cancellation of orders regarding attachment of bank accounts of certain tax defaulters.

Steps for Essential Goods and Services

Various departments issued guidelines to the district administration to facilitate operational continuity of essential goods and services including food items, seeds, fertilisers, and other agriculture-related items, livestock fodder, and petroleum products.

Other Measures taken by the Government of Bihar

• **Education:** On 8 April 2020, the Cabinet approved the proposal to promote students of Class I to XI (except class X) without annual examination.

- **Legislature:** Salaries of MLAs and MLCs have been reduced by 15 per cent for one year. The amount will be donated to the state's COVID-19 relief fund.

- **Labour and employment:** Chief Minister directed to resume public works under the Saat Nischay Programme, Jal Jeevan Hariyali Yojana, and MGNREGA.

Status of Other Health Programmes During COVID-19

Immunisation

It has been observed that an alarming decline in the number of children receiving life-saving vaccines around the state. This is due to disruptions in the delivery and uptake of immunisation services caused by the COVID-19 pandemic. For example, in the April-June in 2020, a total of only 497,753 children aged between 9 and 11 months were fully immunised in comparison to 671,667 children in the same time frame in 2019. Thus, 173,914 children aged 9-11 months were missed, if other factors were not considered. Similarly for the same period of time, immunisation sessions held against planned also declined from 98.4 per cent in April-June 2019 to 81.2 per cent in April-June 2020.

Family Planning

The COVID-19 pandemic has caused tremendous upheaval to health systems in the state of Bihar, disrupting access to family planning information and services too. Despite this disruption, the need for family planning remains the same. The number of live births may be actually higher, since access to abortion services have also been impacted during the lockdown period. Many women who ended up with an unintended pregnancy, may be forced carry their pregnancy to term, since they may not have been able to access abortion care.

An unintended fallout of the nationwide lockdown since 25 March 2020 led to the inability of millions of women to access the services of family planning in Bihar. In April-June 2019, as per the Health Management Information System (HMIS), total 37,434 sterilisation were conducted, 82,656 IUCD insertions were done in public facilities, 2.31 lakh combined oral pills were distributed and 42,201 beneficiaries of first-dose of injectable contraceptive services were provided, by the public sector. However, for the same months in 2020, a decline is observed for the family planning services. In April-June 2020, total sterilisations conducted have declined to 3,820, IUCD Insertions (public facilities) to 46,163, combined oral pills distributed to 1.92 lakh and number of beneficiaries given first-dose of injectable contraceptive services to 15,595.

Outpatient Visits

The COVID-19 pandemic has dramatically changed how outpatient care was delivered in health care practices in Bihar. The lockdown affected transportation, access to health care facilities, and availability of medicines and consumables as well as outpatient and inpatient services. The maintenance of essential care health services on an outpatient

Out Patient Care in Bihar during COVID-19	Apr-Jun 2020-21	Apr-Jun 2019-20
Total OPD(Ayush+Allopathic)	6,228,993	18,410,389

Categorization of Available Health Infrastructure by Assam Health Department		
Category	**Numbers**	**Type of Infrastructure**
Category I	23	Dedicated COVID-19 Hospitals / DCH which includes 7 State Medical College Hospitals, 1 Central Ministry Hospital
Category II	283	Dedicated COVID-19 Health Center / DCHC includes CHCs, FRUs/BPHCs/PHCs/MPHCs/ Model Hospital/ SDCH/ COVID-19 Hospital
Category III	550	Dedicated COVID-19 Center / DCCC includes Hospital/Tea Garden Hospital as well as other than Hospital

basis during and the aftermath of the COVID-19 pandemic, is a major public health challenge. It was observed that the provisions of essential outpatient health care service were disrupted in a significant proportion at PHCs, CHCs and DHs levels across the state.

As per HMIS, NHM, the total number of OPD at public health facilities came down from 18,410,389 (Apr-Jun 2019) to 6,228,993 (Apr-Jun 2020).

TB Control Programme

Though COVID-19 has disrupted the TB care infrastructure across India, Bihar appears to be one of the worst affected. Over 70 per cent of the staff meant for tuberculosis control and testing were reassigned to COVID-19 duty, and continue to be in that role. This led to a massive decrease in TB notifications in Bihar this year. According to public records on the Nikshay dashboard, as many as 63,617 cases have been notified in Bihar in 2020 (35,740 in government hospitals and 27,877 in private institutions). In the same period last year (January-September 2019), 91,836 TB cases were notified in Bihar (58,413 in the government sector, and 33,423 in the private). Overall, India has reported a 60 per cent decline in TB notifications, due to the COVID-19 induced lockdown.

Out-reach Services of ASHA and ANM (Frontline Health Workers)

During this time of disruption in primary health care and OPD services in hospitals due to COVID-19, the ANM and ASHA workers are ensuring continued care to maternal and new-born health in rural areas.

Bihar has been using its large workforce of ASHAs towards its public outreach efforts during the ongoing pandemic. As the country remains in lockdown, with citizens restrained from stepping outside their homes, a large army of ASHAs has been making its way many tasks pivoted around the pandemic control; such as conducting door to door surveys, conducting awareness campaigns among people, overseeing the movement of migrants, sensitisation for social distancing, etc.

ASHAs have been assigned a number of tasks during the ongoing pandemic. Additionally, they were supposed to trace the contacts of COVID-19 patients. They also have to find out if any person in our ward has travelled outside or has come from somewhere recently.

Photo Source- Shutterstock

ASSAM

The first confirmed case of the COVID-19 in the State of Assam was reported on 31st March 2020, exactly a week after the declaration of the national lockdown. While some states had started reporting more than 1000 positive cases per day, Assam was holding out well against COVID-19 with 392 confirmed cases as on 24 May 2020, having an average of just 20 new infection per day. But this controlled trajectory came to an end as the number of infection started to soar up by the end of May 2020. This sudden spike in numbers of positive cases corresponds to the arrival of people who were stranded outside the state, due to sudden declaration of lockdown. As of 31 October 2020, Assam has confirmed 206,351 positive cases of COVID-19, 196,051 recovered cases and 930 deaths. The state as per this data has a death rate of 0.45 per cent.

COVID-19 and State Response

Realising the threat of COVID-19, the State had started developing perspective plan to combat the pandemic, even when no resident was reported to be infected till 30 March, 2020. Commissioner and Secretary, State Health and Family Welfare Department, Government Of Assam was designated as State Nodal Officer for COVID-19 intervention. Further, in order to deal with the sense of panic and insecurity, as well as to render necessary support and information to people, Helpline number details of the key functionaries/designated hospitals, were shared for public reference.

Another significant preparedness was issuance of a Gazette Notification dated 18 March 2020, in exercise of power conferred under Section 2,3 & 4 of the Epidemic Diseases Act,1897, Government of Assam framed a set of regulations for prevention and Containment

of COVID-19 called as The Assam COVID-19 Regulations 2020. This provided a broad based outline to office bearers and service providers, and it authorised them to take necessary initiatives to combat the disease at their respective level.

Rendering services to ever increasing number of persons infected, that too within a short span of life, is an uphill task to the State Health department. The State categorised and geared up available health infrastructure. Anticipating more demand for critical care, bed capacity of ICU facilities were enhanced, a state of the art new unit in Guwahati Medical College was constructed in record time. Besides this, in view of the increase in number of cases requiring critical care, the State has decided to upscale Kalaphar Hospital and Assam Ayurvedic College & Hospital into critical care centre.

Laboratories were approved for both Real-Time RT-PCR and TrueNat. All districts are equipped with adequate screening centres. In the Government facilities, COVID-19 patients receive free of cost treatment. Arrangements have been made for Welcome Kit worth INR 500, daily refreshment worth INR 500 per day, daily supply of fruits worth INR 100. A minimum charge is levied from patients preferring cabin facility.

At a later stage, private hospitals also started providing treatment. In view of the spike in numbers of positive cases in the city, the state health department in July 2020 instructed private hospitals to create special facilities and dedicated teams for management of COVID-19 positive patients. However, as per many reports, COVID-19 treatment in Guwahati private hospitals burns deep holes in pockets. On average INR 2.5-3 lakh is being charged

for a 10 days treatment period. Depending on the severity of cases, the cost may go up to INR 7 lakhs. Patients expressed helplessness in the absence of Government control, over the charges levied by private hospitals.

Screening/Testing and Quarantine

Mandatory Institutional Quarantine is another significant hallmark of Assam Model. Assam is probably the first state to set up a state of the art model quarantine centre, to accommodate persons having recent travel history, presenting any symptoms. Sarusajai stadium was converted in to a makeshift COVID-19 care centre, for people requiring quarantine and treatment support. This indeed is an unique example of preparedness which drew the attention and appreciation at National level. Education Institutes, community centres were converted into COVID-19 care centres, by arranging beds and toilets in other Districts as well.

The Assam Model has been successful in containing the spread of infection, due to multi-dimensional and inter sectoral approach adopted by the State Government. Early tracing of infection, extensive testing and strict quarantine backed by social security measures and community involvement, have helped the state battle the pandemic. The 'testing all who come to Assam' strategy has helped in reducing the spread of infection, and also increased the testing rate in Assam by many folds. As per available data, it even surpassed Kerala, a State known for its excellence in healthcare, in the number of samples tested on 25 May 2020. This could only be made possible due to the well thought out planning, to create more and more testing labs, and screening centres with swab collection facilities.

Plasma Therapy: The Government has ensured to provide all tested and known mode of treatment to COVID-19 cases. One was setting up of Plasma Bank in Guwahati that started collection of Blood Plasma from the patients who have been cured of COVID-19. On 9 July 2020, the state started plasma therapy at GMCH, on serious patient admitted in ICU. So far, 155 people have donated their plasma.

COVID-19 Counselling Centres: Setting up of 31 COVID-19 Counselling Centres (CCC) in Guwahati Municipal Corporation area, to combat the rising curve of COVID-19 cases in Guwahati, was another unique initiative taken up by Government of Assam. 60 more CCCs were set up to reach out to community in an effective manner. These centres provide COVID-19 counselling, swab collection, medical examination, result reporting, shifting of positive cases to Isolation centres, disseminating information regarding COVID-19.

Community Surveillance Programme: The Infectious Disease Surveillance Programme (IDSP) team supported by police and district administration has been instrumental in contact-tracing, door-to-door screening, and surveillance under the Assam Community Surveillance Programme. 1,000 medical team to around 25,000 villages across the state, to check people suffering from seasonal fever and other COVID-19 like symptoms. The government also deployed ASHA workers and MPW to monitor the home quarantine patients. A first of its kind, the Targeted Surveillance Programme in Assam is worth mentioning.

Through Volunteer registration, around 15,000 volunteers were mobilised.

PPE Kits and Medicine Procurement: While ensuring services to people, it is also important to safeguard the life of Service providers, so observing the scarcity of PPE kits in the country, the government imported 50,000 PPE kits from China, and became the first and only state who has independently imported the kits from China. Assam also became the first state to procure Itolizumab for the treatment of COVID-19 patients.

Digital Application Over and above the National Arogya Setu App, the Government of Assam has started a YouTube channel, for spreading awareness among public regarding the precautions to be taken against COVID-19. Also, the government has launched a mobile application called COVAAS for users to get information and updates regarding the COVID-19 in Assam.

The app also incorporates application of lockdown e-pass, live help desk and many more. The government with the help of National Informatics Centre (NIC) of Assam, has launched an app called COVID-19 Suraksha, to monitor the status of each home quarantined persons.

Status of Regular Health Programmes: The COVID-19 outbreak has thrown unprecedented challenges at our health system and Health teams at all levels. While responding to the outbreak, there was an apprehension that non-COVID-19 essential health services such as Maternal New born and Child Care, Dialysis, Tuberculosis, HIV, maintenance of voluntary blood donation etc. would be compromised. All Deputy Commissioners, Joint Directors, Health Services, Government Of Assam were directed to deliver/maintain the essential health services during the COVID-19 outbreak covering several important aspects of health system preparedness including reorganisation of service delivery, human resources, supply of medicine and diagnostics, programme management etc.

Lock Down Effects: The COVID-19 outbreak and consequent lockdown hit the State's economy heavily. The Good and Services Tax (GST) collection in Assam dropped by around 80 per cent in the month of April 2020. Further, the normal operations in tea gardens were under shutdown from 25 March till 14 April 2020, due to which the tea industry incurred a loss of around Rs 1,059 crore in revenue. The tourism industry also suffered a great loss due to COVID-19 lockdown.

As per conservative estimates, around 3.4 lakh people combining migrant workers, students, people working abroad, tourists, patients returned to the state during lockdown. SAMPARKA (Software Application for Migrated Person to Assam for Rejuvenating Karma Abhiyan) launched by the Panchayat and Rural Development department has registered more than 17,000 migrants workers eligible for the facilities, including job cards under MGNREGA.

Measures Taken for Education: Since the first phase of the nation wide lockdown all educational institutes remained closed till October 2020. The Assam Government has directed the schools to provide students with course materials, and short video lectures on topics in the syllabus through Whatsapp, to prevent learning gaps during the closure of educational institutes. While select private schools and KVKs have been successful in conducting online classes, the same has not been feasible for State Government schools located in nooks and corner.

The Assam Government also directed private schools to waive 50 per cent of fees for the month of April 2020. The schools have also been directed not to increase fees during lockdown, and to pay teaching and non-teaching staff without a pay cut. The Government also launched a local educational television/AIR channel Gyan Brikshya for classes I to XII, to cover the learning loss due to the COVID-19 pandemic and lockdown.

Schemes and Programmes Launched: On 27 April 2020, the Chief Minister of Assam announced a life insurance cover of INR 50 lakhs for journalists. The State Government also ensured to provide free COVID-19 testing for reporters. The State Government launched a series of support services and schemes to meet the challenges that emerged with the outbreak of COVID-19. BPL families were supplied with ration during lockdown. Additionally, the Government also delivered INR 1,000 to the families, which are economically not well off, and are not covered under the National Food Security Act, 2013.

The Panchayati Raj Institutions and urban local bodies were given COVID-19 responsibilities, starting from selection of the beneficiaries to the disbursement of monetary assistance to proper maintenance of APR etc. Besides this, when any individual is placed under home quarantine with other members of the family, the Government provided rations depending on the size of the family.

The Government also gave INR 25,000 to each cancer, kidney and heart patients in first instalment, and also gave another INR 25,000 in second instalment to the same patients stranded outside the state, during the COVID-19 lockdown.
To support the folk artistes of Assam in these challenging times, the Government has decided to provide INR 2,000 per month to each folk artist, for 3 months.

The Government has also launched a scheme called Dhanwantari, to make home delivery of locally unavailable medicines amid lockdown restrictions, but later limited it to quarantined people only due to relaxations in lockdown rules. The Government also allocated INR 20,000 towards the expenditure in quarantining each person arriving from outside the State.

Photo Source : Reuters

KERALA

The first case of COVID-19 in India was reported in the state of Kerala on 30 January 2020. As of 31 October, 2020 Kerala had confirmed 332,994 cases with 1,457 deaths. Even as cases shot up in the State post May 2020, the death rate for the latest data quoted above is 0.43 per cent, much lower than the national death rate. The demography of Kerala population is unique, which makes handling COVID-19 pandemic a challenge. The state is among the most advanced in terms of demographic and epidemiological transition, with the largest proportion of elderly and those suffering from non-communicable diseases including diabetes, hypertension, cardio-vascular diseases, and cancer. The high illness demographic, especially the 15 per cent elderly population and 12 per cent of children, below six years are making the State more vulnerable towards the pandemic. High density of population and huge number of migrant labourers working in the state, also increase the risk of COVID-19.

Tourism is the major business of Kerala and and a significant demographic of the state is employed outside the country, the State has been highly vulnerable to travel related COVID-19 cases. As per an estimate, about seven lakhs people originally hailing from the state returned during the pandemic, mostly from pandemic hit countries.

The State has been disaster ready as it recently faced Nipah epidemic attack, and two consecutive floods. The experience of working with various stakeholders to overcome these disasters through grassroots network and establishment of effective communication channels, helped the Government against COVID-19 as well. Local bodies were well aware and equipped with effective strategies to prevent the spread. The Government initiated "Break the Chain" movement to generate widespread awareness on the importance of hand washing, to prevent the pandemic. Daily media briefings of the Chief Minister acted against the spread of misleading information.

Early Screening

Early screening of all the incoming passengers was put in place at all the airports, and sea ports in the State. When the cases started rising in the country, incoming passengers from other states at Inter State Bus and train terminals were also screened.

Building a Participatory System for Surveillance and Contact Tracing

Kerala's response against the current pandemic is heavily dependent on developing a community cantered system for surveillance and contact tracing. Health staff was deployed in airports and railway stations to screen patients coming from abroad, and other states and information directly channeled to District administration and local bodies. This surveillance system took on a community-based character with the involvement of elected representatives of local governments, particularly village *panchayats*, members of the self-help group (SHG) system called 'Kudumbashree' in Kerala, residence associations and other community groups. This grass root groups played multiple role including essential goods suppliers of quarantined people as well as meal providers of migrant labor camps. This form of community ownership made the task of surveillance and tracing easy. This also generate wide spread awareness on COVID-19 prevention behaviour.

Systemic Investment in Strengthening Health Infrastructure

The Government has been systematically investing in strengthening its health infrastructure. During the pandemic, the state government set-up at least two COVID-19 dedicated hospitals in each district to treat the positive cases with well-trained staff and team from all specialities. State and District Medical Boards were constituted to bring out

treatment and discharge protocols, and assess each positive case.

Collaboration with the Public and the Private Sector

In response to the State Government's call, owners of private hospitals, hotels, resorts, convention centres, empty houses etc., came forward to provide sufficient infrastructure to arrange isolation and quarantine facilities for patients and their primary contacts. Several volunteers supported these centres by taking the responsibility of cleaning. Masks were largely produced by local garment units as well as Kudumbashree groups.

Sanitiser production was increased by State Drugs and Pharmaceutical Ltd. Corporate groups sponsor thousands of PPE kits. In its daily briefing, the Government recognised and appreciated these efforts of private and public players. This developed a PPP Bond and has been helpful for the state in maintaining the resource flow.

Building a Roof of Care

Government of Kerala, Local Self Governments and Civil Society Organisations jointly developed several social security measures. One such valuable initiative is of "community kitchen". Nearly 30,000 community kitchens fed, 25-30 lakh people daily. The spirit of volunteerism was also visible in all this efforts.

With regards to providing shelter, Kerala was most active and sheltered 3.03 lakh people during the initial phase of the lockdown. This is nearly 50 per cent of all people who have taken shelter in government camps across India.

Social security pensions, assistance from the welfare funds, interest free loans to the members of the SHGs, free rice to every card holder, distribution of essential condiments

kits, and doorstep delivery of nutrition to every ICDS targeted families are among the major social security measures that were continued to build up confidence among common public.

How a Pandemic Led to a Mass Movement

Kerala's strong Local Body Governments played a vital role in the community-based pandemic control programme. At village level, under the leadership of local governments, especially village panchayats, municipalities, and municipal corporations, a community action group was formed. It consisted of local body members, frontline health workers, police, Kudumbshree volunteers, residence association and trade unions to monitor the COVID-19 management activities. This created a community feeling as people not only felt that help was nearby, but also themselves identified their role in the pandemic prevention. A new civic sense emerged by respecting social distancing norms. As a result, people understood and voluntarily avoided worship places and social gatherings.

Role of Kerala Voluntary Health Services

Like many other civil society organisations, Kerala Voluntary Health Services (KVHS) also took some time to realise its role in the pandemic management. KVHS, with the support of medical and social experts, developed two standard operating procedures for general public and office employers, respectively. It also developed warning badges for the use of frontline health workers and front office staff. The state level organisation also conducted advocacy campaign, for government action to strengthen the ban on smoking and spitting in public places. More than sixty webinars were organised for members of residence associations, trade associations, trade unions and community group leaders to generate awareness and behavioural change, in accordance with pandemic control. Further, IECs were especially designed and developed to engage children. KVHS also sourced seven volunteers to Government offices in different districts to meet the shortage of public health staff.

Limitations Observed in Kerala's Pandemic Management

Apart from the above achievements, Kerala's pandemic control has certain short comings as well. The spirit of coordination and solidarity developed at the administrative level, did not penetrate to political leadership. Therefore, Government was unable to bring consensus among political leadership on its decisions. Several controversies came up, and political protest on it created a social environment against the expected civic behaviours. This over loaded the work of Police and brought down the morale of Health professionals. Governments' response, Social Security measures developed a sense of confidence among common people which sometimes lost their caution.

Kerala's initial response to the COVID-19 outbreak was pre-emptive and focused. The initial strategy of aggressively isolating, quarantining, and contact tracing worked very well. However, in the following phases, the focus should have been on sharpening surveillance strategies, to detect community transmission rather than just containment. Early hospital-based surveillance and surveillance of viral pneumonia cases should have been initiated in a decentralised manner.

Further, as the State faced a surge in cases, the private health care sector should have been taken into confidence to amp up critical care capacity. The government is now trying to enhance the health system capacity and keep the transmission down.

People maintaining social distance in long queue as they wait for their turn to take subsidized grains provided by the Government of Madhya Pradesh during Pandemic

MADHYA PRADESH

Madhya Pradesh is the second largest state in India and the country's fifth most populous state, with a population that is a little smaller than that of Turkey. More than 70 per cent of the population lives in rural areas, where agriculture is the main source of most of their livelihoods.

The first four cases of the COVID-19 pandemic in Jabalpur, Madhya Pradesh were confirmed on 20 March 2020. As of 31 October, 2020 the state had confirmed a total of 171,359 cases and 2,951 deaths. The COVID-19 cases have mainly increased in major cities like Indore, Jabalpur, Gwalior and the capital city Bhopal.

State Government's Pre-Lockdown Response

The Madhya Pradesh government issued directions to monitor international travellers from specified countries, test and maintain surveillance on those who are symptomatic as early as 28 January, 2020. While efforts were largely focused on screening and testing, the first quarantine restrictions for symptomatic travellers from China, entering India after 15 January 2020, were imposed on 31 January 2020.

In February and early March of 2020, the State government focused on improving public health capacity and restricting social gatherings. A helpline, with a dedicated call centre, was set up to inform citizens about

COVID-19 and its prevention. The regional directors of the Directorate of Health Services, Government of Madhya Pradesh, were instructed to ensure availability of N-95 masks and PPE kits in their region. The Health Department issued guidelines to the Chief Medical and Health Officials in the State regarding the collection and transport of COVID-19 test samples. Medical professionals in public hospitals were ordered to attend a national training. An order was issued to improve arrangements for quarantine and isolation wards. Leaves were cancelled for all employees/officers of the Health Department. To grant certain rights to establish effective control over outbreak affected areas and take swift actions, section 71 of the Madhya Pradesh Public Health Act, 1949 was invoked. This section of the Act provides all Chief Medical and Health Officers and Civil Surgeon cum Chief Hospital Superintendents rights set out therein.

As the number of cases in India increased through March 2020, the MP Government shifted strategy, and issued orders to spread awareness about COVID-19 and implement social distancing. A dedicated portal was created for COVID-19 related information. An order was issued to close several establishments including schools, colleges, cinema halls, gyms and swimming pools. Biometric attendance was stopped at all government workplaces.

On 20 March 2020 the Government issued an order (effective till June 15) requiring suppliers of masks and sanitisers to:

(i) maintain a fixed price and (ii) keep and present fortnightly, a record of purchase and sales of the essential items. The order also prevented them from refusing to sell to any customer.

After the first four cases of COVID-19 were confirmed in the State on 20 March 2020 the government released the Madhya Pradesh Epidemic Diseases, COVID-19 Regulations 2020 to prevent the spread of COVID-19 in the state on 23 March 2020. These regulations specified special administrative powers and protocol for hospitals (government and private), to follow while treating COVID-19 patients. These regulations are valid for one year.

State Government's Response During Early Phase of Lockdown

Healthcare measures: Preparation of hospitals for the treatment of COVID-19 including postponing elective surgeries, ensuring an adequate supply of PPE kits. On 28 March 2020 the Bhopal Memorial Hospital and Research Centre was designated as a state-level COVID-19 hospital. This order was reversed on April 15. District collectors were empowered to appoint doctors and other healthcare workers as required in their districts, in a fast-tracked manner. A telemedicine unit in each of the 51 district hospitals was established. The appointment of final year undergraduate nursing students as nurses was facilitated. On 29 March 2020 the government launched the SAARTHAK app for daily monitoring and tracking of quarantined and corona positive patients. Regarding immunization, the state government issued directives to all Chief Medical and Health Officers and District Immunisation Officers to continue regular immunisation services during COVID-19. They were also directed to organise catch-up sessions after lockdown.

Welfare measures: One-time financial assistance of INR 1,000 was provided to construction labourers. One-time financial

assistance of INR 2,000 was provided to families of Sahariya, Baiga and Bharia tribes. Social security pensions for two months was paid in advance to pensioners. People without eligibility slips under the National Food Security Scheme were to be allowed to receive ration.

Administrative measures: Senior officials were designated to coordinate with various states to resolve issues regarding migrant labour. District Crisis Management groups were formed to coordinate state-level policy and the local implementation machinery.

All Standard Operating Procedures given by Central government regarding labour in shelter and relief camps were followed by the State Government. The Madhya Pradesh Government had to cut the annual budget for 2020-21 by 12 per cent. The mega event of IIFA was cancelled, and it was decided to divert INR 700 crore fund allocated for IIFA to CM Relief Fund.

During the lockdown period, Directorate of Revenue Intelligence (DRI) raided various pan masala/gutka factories, cigarette factories. Tobacco products were also seized in various districts of the state like Jabalpur, Gwalior, Shajapur etc. by various Government agencies.

Supply of essential goods and services: On 8 April 2020, the Government implemented the Essential Services Management Act, 1979. The Act among other things, prohibits anyone employed in essential services to refuse to work. E-pass procurement facility was started to ensure smooth inter-district and across states flow of essential goods & services.

The IITT Approach

The Madhya Pradesh government released a strategy document to contain COVID-19. The State government adopted a four-pronged approach to tackle the pandemic, through strategy aiming at Identification, Isolation, Testing and Treatment (IITT). First, to identify Coronavirus affected areas, isolate them and test their residents; then to treat the patients if found positive.

Identification: Identifying people with COVID-19-like symptoms, through contact tracing and surveillance. As part of an active screening process, 85 Rapid Response Teams (RRT) and 19 Special Response Teams (SRT) were formed and given the responsibilities of contact tracing and monitoring quarantine centres. The emerging hotspots, clusters and outbreak areas were identified through rigorous contact tracing and testing of all high risk first contacts. All passengers were screened at the point of entry; i.e. bus stands, railway stations, airports etc. Digital platforms were leveraged for close coordination between the teams.

For the active identification of COVID-19 suspects, the State leveraged technology and deployed an **app named SARTHAK** as the principal modality for both rigorous contact tracing and active surveillance, towards the identification of Severe Acute Respiratory Infections (SARI) or Influenza like Illness (ILI) cases by field teams. The app enables survey teams to capture the information of people being surveyed for SARI/ILI, and to capture the first contact information of positives; then pushed this data to the concerned teams for sampling, allowing epidemiologists to confirm positives, and push the data again on survey team's user credentials to close the loop.

Data flowing in from the app on the state's portal was subject to intensive analysis for early identification of potential hotspots, areas that require more intensive surveillance, gaps in contact tracing etc.

For passive surveillance, **'fever clinics'** were activated across the state. These clinics were established as the first point of contact for the suspected COVID-19 patients, set up to address patients suffering from SARI or ILI.

Isolation: Isolating those who suspect they may have COVID-19, or have been exposed to the virus in quarantine, and keeping the positives in isolation. Measures were also identified to segregate those affected by the degree to which they were at risk. Importantly, three tier facilities have been developed for the isolation of suspected/ confirmed COVID-19 cases- a) COVID-19 Care Center (CCC) for pre-symptomatic/ very mild/ mild cases, with symptoms like fever, cough, sore throat etc, b) dedicated COVID-19 Health Centre (DCHC) for those requiring oxygen therapy, and c) dedicated COVID-19 Hospital (DCH) for those requiring intensive care or ventilator management.

Testing: Testing all people who fit the Indian Council of Medical Research (ICMR) criteria free of cost. The state ramped up its testing capacity in a big way, moving from a testing capacity of a mere 600 tests per day in April 2020 to 8,980 tests per day in mid-June 2020. Tests per million people, consequently, moved up from a mere 40 tests per million in April 2020 to 4,004 tests per million in mid-June 2020. Due to an increase in testing capacity, the number of samples being tested and being reported positive also increased over time.

The State conducted a door-to-door survey with a KILL CORONA campaign from 1 to 15 July 2020, wherein every single household in the state was surveyed for possible SARI/ILI cases. The survey has been completed in 2.5 million households, covering 12.3 million in the state.

Treatment: Appropriate treatment provided as per the symptoms. Free-of-cost treatment was made available to any COVID patient, or suspected patient admitted at any of the existing public, or contracted private hospitals in the state. This ensured the identification of patients, thereby reducing the chances of further transmission.

The Madhya Pradesh Health Department increased the number of beds with oxygen support from 230 in March 2020 to 7,076 by July 2020. The new plan is to increase the number of beds with oxygen support to 12,000 in future. Similarly, there has been a much needed increase in intensive care facilities. ICU beds in public sector hospitals were increased from 537 to 788 by July 2020, in two months. The medical education and health department had proposed an addition of 945 ICU beds. Further, from April to June 2020, the heath department claims to have increased the number of beds in government-run hospitals almost 10-times. From a mere 2,428, bed strength in the public sector has drastically increased to 23,610.

Thus, the 'I-I-T-T' strategy not only enabled rapid control over the spread of the pandemic in the state, but also helped to further strengthen public healthcare.

Tobacco Control Team: The guideline issued by ICMR regarding the spread of COVID-19 through spitting resulted in the indirect integration of Tobacco Control programme and COVID-19. The Indian government has passed The Cigarettes and Other Tobacco Products Act, 2003 (COTPA) in order to protect people from the harmful effects of tobacco use. Its various sections provide power to authorities to control tobacco use. However, it has been observed that only Indian Tobacco Control Act has not been effective, and using other acts with it has more impact. Thus, MPVHA during the lockdown period studied various acts and sections of Indian Penal Code including Sections 144, 268 and 269, Disaster Management Act, Municipal Act, Food & Safety Act, MP Public Health Act 1949 etc. to evaluate the provisions which can be used for tobacco control.

Liaisoning was done with policy makers and implementers, as well as civil society members regarding the use of the acts for tobacco prevention and control. After the preliminary discussions, the draft orders related to various sections were prepared and sent to Principal Secretary, Commissioner Health and District Collectors of the State. Discussions were also held with District Collectors regarding the same, during which they were briefed about the sections which can be used for tobacco control at state and district level. The efforts resulted in a number of orders issued for Tobacco prevention and COVID-19 in different districts. Around 40 District Collectors issued orders by applying various sections of IPC for prevention of COVID-19 and tobacco control in the state. Section 268 and 269 of IPC were used to prohibit spitting at public places and use of tobacco at public places. Section 144 was used to prohibit sale of tobacco during lockdown situation in COVID-19. Urban Administration department used Municipal Act to prohibit spitting.

Mask Distribution : Masks were distributed through member organisations to most needy and vulnerable groups such as vegetable sellers, labourers, shop owners, petrol pump workers, etc. The masks also contained the message of "No Tobacco" and "*Jindagi Chuno, Tambaku Nahi*" (Choose Life, Not Tobacco) on both sides of the mask.

Reducing Anaemia and Malnutrition Programme Team: The State Health Department involved MPVHA team during lockdown, and initial COVID-19 infection period to extend hands of the department in ensuring the uninterrupted health commodities/supplies from State to Block and demand of essentials requirement from Block to State. Under this programme, the MPVHA played a versatile role as it facilitated and helped the department in uninterrupted supply of drugs, consumables and equipment upto Block level in about 100 Blocks. Further, orientation through tele-calling was provided to ASHA, ANM, ASHA Sahyogini, ICDS personnel, PRI members, stakeholders and among community members. Support was also given to MP Government for COVID-19 case data collection from various districts. MPVHA also disseminated MoHFW IEC on Reducing Stigma and Discrimination by involving Religious Leaders, Teachers, Doctors and CBOs.

Double Fortified Salt Program (DFS) Team: The team facilitated the district administration in 5 tribal districts of Indore division, to ensure uninterrupted supply of food through Public Distribution System. The team contacted through phones and disseminated information related to COVID-19 prevention to 1,050 women covered under PDS system (those who have ration cards), 600 Front Line Workers and 275 staff members of food department (warehouse and Fair Price shop owners).

MPVHA Amrita Drishti Urban Eye Health Care Team: More than 300 beneficiaries (either referred or gone through cataract surgery), and more than 620 transporters (drivers and cleaners) were contacted telephonically and informed about protecting themselves from COVID-19, and about taking care of their eyes. It included maintaining social distancing, mask wearing, use of hand gloves, avoiding going out and rubbing their eyes.

Participatory Learning Action- ASHA Programme Team: ASHAs are the first port of information for communication for the village community. This makes their protection was very much warranted. In order to protect them from this dreaded virus, MPVHA under the PLA program distributed masks to ASHAs of Blocks Rama and Thandla of Jhabua District. Further, 100 Sehat Sakhi were equipped with information to stand against COVID-19.

Member Organisations of MPVHA: The member organisations of MPVHA offered their continuous commitment and brave initiatives in different pockets of 40 districts

of the State. They catered various felt needs of the poor community, extended hands to the local administration, distributed masks and food and ration packets to the most needy and vulnerable groups, and made the community acquainted with the technical information in a very simple local language, to sensitise them about the importance of protection from COVID-19. The members also tried to reduce the fear and stigma related to COVID-19 infection.

Conclusion

COVID-19 has emerged not only as a serious health and medical crisis, but also as much a psycho-social, economic crisis which will have longstanding effects on people and on the economy and health system. It has already created devastating effects but collectively we shall overcome it.

Health preparedness is necessary for dealing with any unprecedented situation in the future. Special attention should be given to vulnerable people like pregnant women and new-borns while planning for such events. Effective preventive and clinical strategies are needed to control COVID-19 infection among pregnant women and lactating mothers. Governments also need to make sure that women can access basic information to protect the health of themselves and their babies. Arrangements should be made for assuring proper means of transportation and availability of Maternal and Child Health Services.

The TB programme has been severely neglected due to lockdown. Various issues need to be addressed such as reallocation of staffs already working under National

TB Elimination Program (NTEP) to combat COVID-19 creating overburden, priority to diagnose COVID-19 rather than TB by laboratories leading to diagnostic delay, use of established TB hospitals and sanatoriums for admitting patients with COVID-19, disruption of transportation facilities, interruption of DOTS treatment due to restricted mobility. Therefore, it becomes essential that our national TB programme should remain operational, and that people have easy access to diagnostic services, treatments, and support services for TB during this era of COVID-19 pandemic. TB programmes must have a system in place to continue to support patients on DOTS treatment, by ensuring adherence, monitoring of side effects from the medications, health education, and providing psycho-social support.

Community based activities have shown sustainable and more engaging results, as they involve people in the process of prevention and management, thereby increasing a sense of civic responsibility. Community based approach also makes people feel that help is approachable and quite near.

Even the exceptionally performing States such as Kerala have left lessons which point towards the importance of stringent application, and continuous review of strategy implementation during such an unprecedented catastrophe. The administration needs to remain consistently watchful in order to mitigate the impact of the virus.

Photo-courtesy-SNEHA

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UNIT 5 COVID-19 and the World Economy

Endnotes:

1. This seems to be the pattern of the predictions, a sort of reversion to the norm.

2. The World Bank's Global Economic Prospects predicts a larger decline for commodity exporting developing countries than for developing countries as a whole.

3. The World Bank has a different regional categories and it breaks Asia into basically East Asia and South Asia. South Asia does worse than East Asia.

4. Please refer to ILO Monitor: COVID-19 and the world of work monthly publication for the details.

5. The GDP growth declined for eight consecutive quarters starting from Q2 of 2018.

6. Normally when A purchases inputs from B, he provides a letter of credit from his bank that B sells to his bank. In the 2008

financial crisis the flow of credit froze as B's bank could not trust the creditworthiness of A's bank and so central banks stepped in to buy the paper and this enabled the unblocking of the credit market. That is why currently governments have acted to provide credit guarantees. These would help maintain supply.

7. For details on monetary and fiscal responses from various countries, refer to IMF policy tracker.

8. Since all governments have provided loan guarantees and it is not easy to translate into the stimulus equivalent, it Is not always easy to calculate the stimulus effect of government measures.

9. For details, please refer https://www.worldbank.org/en/about/what-we-do/brief/world-bank-group-operational-response-covid-19-coronavirus-projects-list

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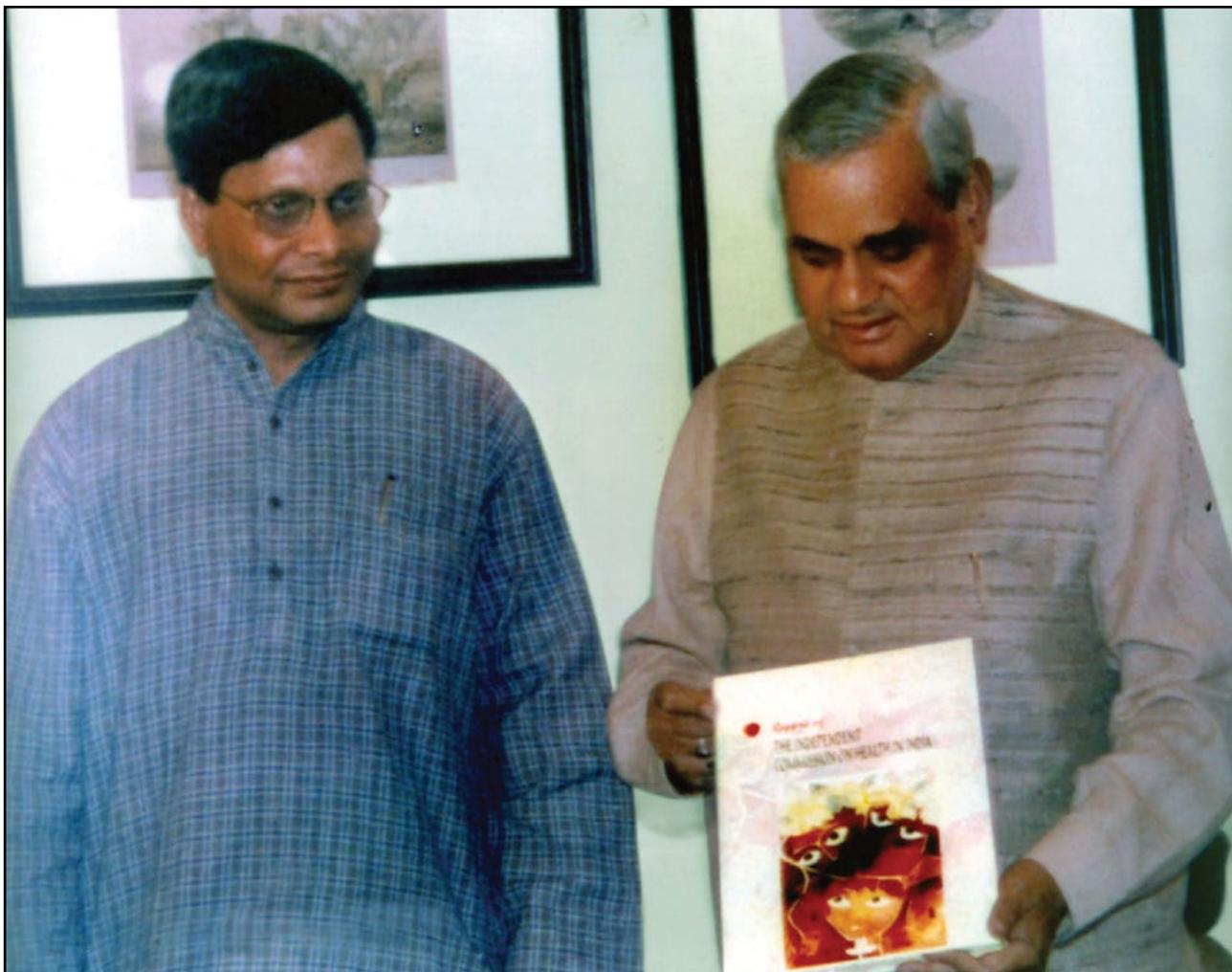
The Commission's first report was officially released by the Honourable Prime Minister of India, Shri Atal Bihari Vajpayee in 1998

A Roadmap to India's Health report was officially presented to Shri Venkaiah Naidu, Hon'ble Vice President of India by ICDHI's members in 2018

Independent Commission on Development and Health in India

Independent Commission on Development & Health in India was set up in the year 1995 to address the growing concern on unacceptable decline of nation's health and inadequate response of the system to meet the complex challenges. A group of most respected health thinkers and practitioners of the country came together to form the Commission under the patronage of Voluntary Health Association of India.

The first comprehensive report of the commission was presented to then Prime Minister, Shri Atal Bihari Vajpayee in 1998. The Honorable Prime Minister ensured that the major recommendations of the report were incorporated in various programmes, leading to many significant policy changes. The report thoroughly analysed the State of India's Health and came up with clear recommendation on how to tackle them through an evidence based, people centered sustainable strategy. This resulted in the formation of the National Rural Health Mission to overhaul the rural health services. Since 1998, the commission has released a significant number of reports on specific health problems faced by the country.

In the last two decades, the Commission has come out with a significant number of such reports on specific health problems confronting the country. Many ways, they have formed the basis of policy changes, both at the Centre and at the State level. Thus the Commission continues to play a vital role in India's Health arena. The Commission works closely with the Prime Ministers' Office, Ministry of Health & Family Welfare, NITI Aayog, World Health Organization, Non-government Organizations, Panchayati Raj Institutions and other relevant forums. One such comprehensive report was the Road map to India's Health which addresses health challenges faced by the country. It was officially presented to Shri Venkaiah Naidu, Vice President of India in April 2018.