

# Effectiveness of Preventive and Treatment Measures For COVID-19: In Special Reference to India

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DOI: 10.29322/IJSRP.10.07.2020.p10394  
<http://dx.doi.org/10.29322/IJSRP.10.07.2020.p10394>

**Abstract-** The Covid-19 pandemic is the most crucial global health crisis since the 1918 Influenza (Spanish flu). Coronavirus disease was reported by the World Health Organisation (WHO) China country office as a form of epidemics, on 31 December 2019. Patients from Wuhan city of China's Hubei province were suffered from lower respiratory tract infections which were treated as pneumonia. WHO declared COVID-19 a Global pandemic which is caused by SARS-CoV-2. A fresh figure of 11,830,885 confirmed cases and 544215 death records till 8<sup>th</sup> July 2020 across the worldwide signify the severity of coronavirus infection. According to Ministry of Health and Family Welfare, Government of India, a total confirmed case 264944 and death is 20642 since 8<sup>th</sup> July 2020. Unfortunately, yet no specific drugs and approved vaccines developed but tremendous efforts are on the way to develop the same. At this condition, implementation of an effective preventive and treatment measures is the only option left to against dreaded the virus. The paper aims to examine the various preventive measures and treatment be a potential intervention to mitigate the spread of disease and check whether the recovery rate of COVID-19 patient increased or not in India. Google scholar, Scopus, NCBI Pubmed databases have been searched for relevant articles and information.

**Index Terms-** COVID-19, SARS-CoV-2, Pandemic, Treatment, Prevention

## I. INTRODUCTION

Today, Majority of World Population the entire world is envisaging a severe crisis which is being known as Coronavirus Pandemic 2019. Outbreak of Corona virus came out in late December when, a patient from Wuhan city of China's Hubei province were suffered from lower respiratory tract infections which were treated as pneumonia. Coronavirus disease was reported by the World Health Organisation (WHO) China country office as a form of epidemics, on 31<sup>st</sup> December 2019. WHO declared COVID-19 a Global pandemic which is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

SARS-CoV-2, initially named novel coronavirus or 2019-nCoV, is a positive single-stranded RNA virus belonging to the family *Coronaviridae*. This family includes viruses that cause diseases ranging from the common cold to MERS and SARS [1]. As zoonotic pathogens, coronavirus is present in both humans and a variety of different animal species (fauna and birds, rear mouse, mice, and other barbaric animals) and typically precipitate infections in respiratory, gastrointestinal, hepatic, and neurologic systems [2, 3].

Government of India are continuously on work to establish the countermeasures to stem possible devastating effects of the pandemic - health organisations working with coordinating the information flow and outstripping directives and guidelines to mitigate the impact of the threat best. At the same time, scientists throughout the world are working tirelessly to collect the information about transmission mechanisms, the clinical spectrum of disease and developing rapidly new diagnostic techniques, prevention and therapeutic strategies. It is not possible to say about the time when the pandemic will reach to its peak because both the virus-host interactions and the mechanism of evolution of the epidemic have many uncertainties. In this consequence, the therapeutic strategies to deal with the disease are only supportive, and prevention expected at reducing transmission in the community is regarded as the best weapon.

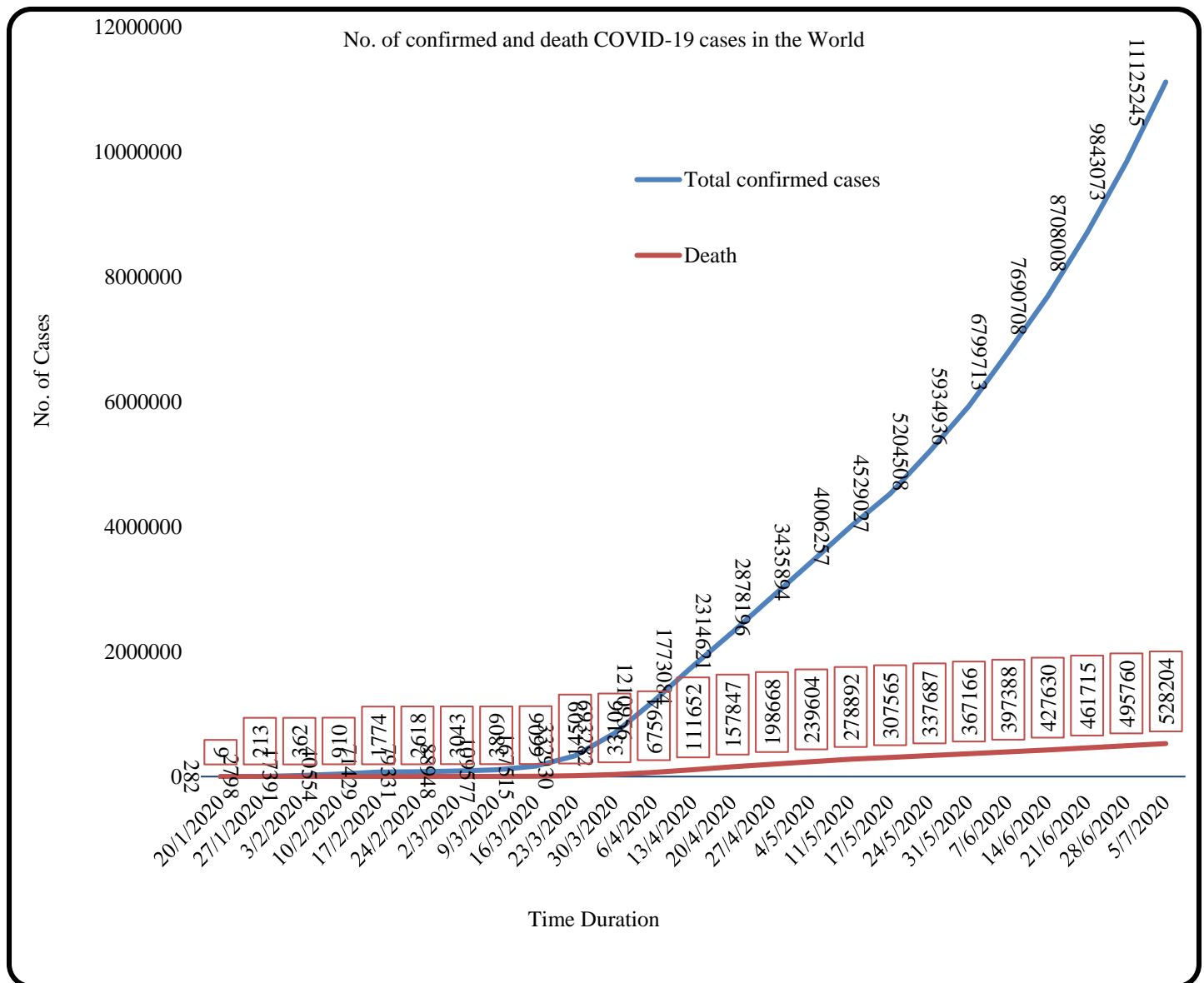
The paper aims to examine the various preventive measures and treatment be a potential intervention to mitigate the spread of disease and check whether the recovery rate of COVID-19 patient increased or not in India.

## II. EPIDEMIOLOGY

### Prevalence of COVID-19

The first case Covid-19 can be traced back to 17<sup>th</sup> November 2019, according to media reports on unpublished Chinese government data and for about one month after that date, there were one to five new cases reported each day. The South China Morning Post' column stated, "there are 60 confirmed cases by 20<sup>th</sup> December" [4].

On 31<sup>st</sup> December 2019, the WHO China Country Office firstly was informed of cases of pneumonia unknown aetiology detected in Wuhan City, Hubei Province of China. Between 31st December 2019 to 03rd January 2020, a total of 44 case-patients with pneumonia of unknown aetiology were reported to WHO by the National Authorities, China. During this reported period, the



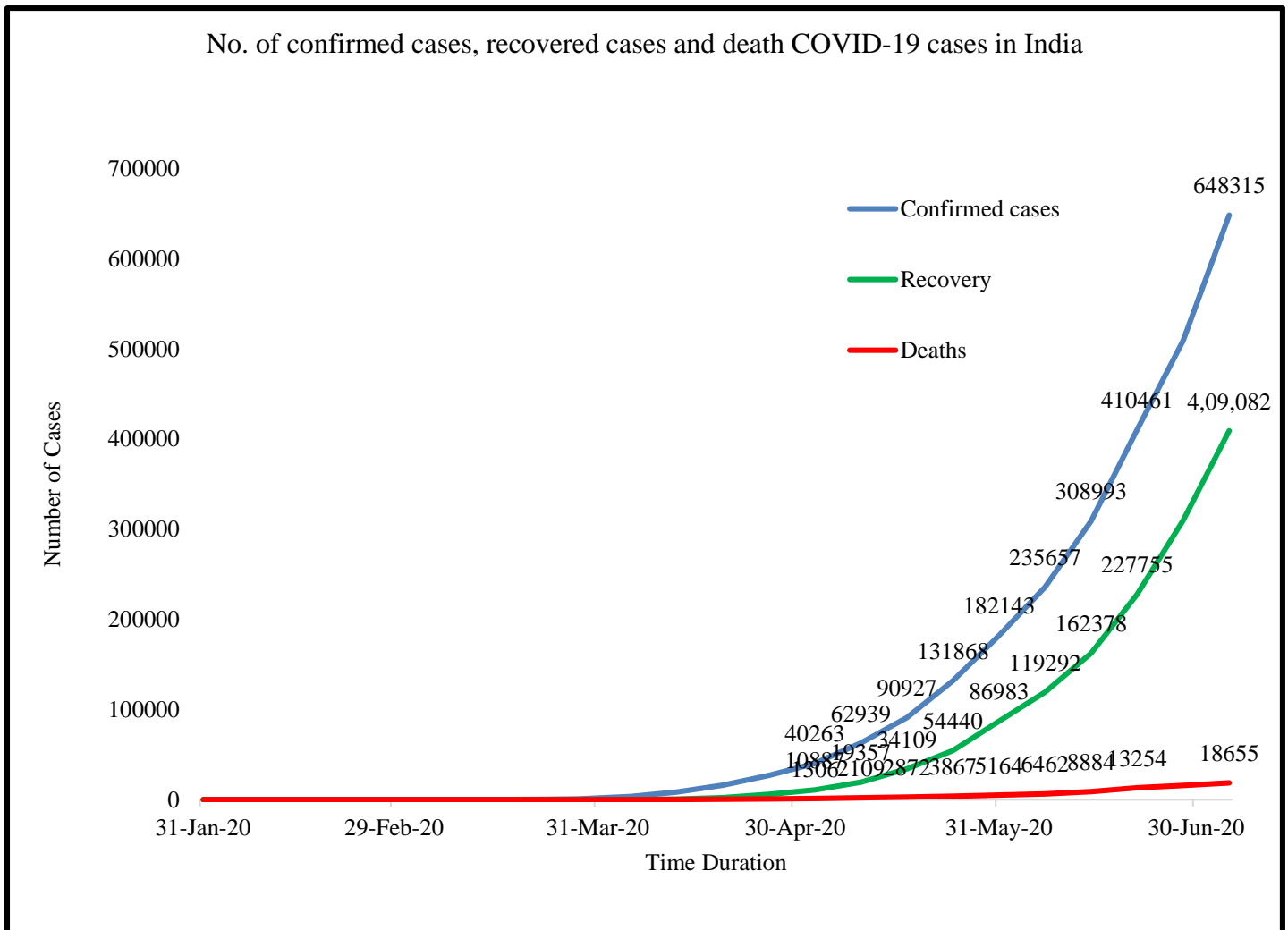
causative agent was not identified. On, 11-12 January 2020, WHO obtained further comprehensive information on the disease from the National Health Commission, China and concluded that the outbreak is accompanying with exposures in one seafood market in Wuhan City [5]. By 22<sup>nd</sup> January 2020, 571 confirmed cases of COVID-19 were reported in China, and 95 cases are severely ill, and 17 people had died [6]. Till the end of January 2020, the virus was spread to several countries including in India, Taiwan, USA, Sri Lanka,

Figure 1: Chart showing number of confirmed and death COVID-19 cases in the World (Source: WHO Situation Reports from 31/01/2020 to 5/07/2020) Death, and confirmed infected cases are shown, on respective lines at 5 July, 2020 in the World.

Singapore, France, Germany, UK, Italy, Spain, Thailand, Vietnam, Malaysia, Nepal, Cambodia, Japan, Republic of Korea, Australia, the United Arab Emirates, the Philippines, Canada, and Finland. The WHO, on 30<sup>th</sup> January 2020, articulate COVID-19 a Public Health Emergency of International Concern [7]. Further, WHO risk assessment on Global level consider it very high as on 10<sup>th</sup> March 2020, with the majority of cases n=9172 seen in Italy alone (European region), followed by Korea (Western Pacific Region) n=7513 and Iran (Eastern Mediterranean) n= 7161 [8]. As a consequence, WHO declared the COVID-19 outbreak as a Pandemic, on 11<sup>th</sup> March 2020 [9]. On 24<sup>th</sup> April, the total confirmed cases were 23,14,621 and deaths 1,98,668, which increased to 11,500,302 and deaths 535,759 on 7<sup>th</sup> July 2020 (see Fig No. 1).

**India**

The first laboratory-confirmed case of 2019-nCoV, the patient, a student returning from Wuhan, reported in Kerala, India, on 30<sup>th</sup> January 2020 [10]. As of 09<sup>th</sup> March, a total of 44 confirmed cases have surfaced in India in which these states were included: Delhi (4), Haryana (14), Jammu (1), Kerala (9), Ladakh (2), Punjab (1), Rajasthan (2), Tamil Nadu (1), Telangana (1), Uttar Pradesh (9), and



of these, 16 are foreign nationals [11]. Ministry of Health & Family Welfare (MoHFW), GoI reported a total of 23,077 COVID-19

Figure 2: Chart showing number of confirmed and death COVID-19 cases in India (Source: WHO Situation Reports from 31/01/2020 to 05/07/2020) Death, Recovered and confirmed infected cases are shown, on respective lines at 05th July, 2020 in India.

confirmed cases, 718 deaths, 15,267 cured instances had been reported in 31 states/union territories on 24<sup>th</sup> April 2020 which has increased to 2,64,944 confirmed cases, 20642 deaths, and 456830 cured cases as on 8<sup>th</sup> July 2020 (see Fig. No. 2) [12].

In 33 states/UT, the worst hit of COVID-19 Pandemic is Maharashtra, Tamil Nadu, Delhi, Gujarat, Uttar Pradesh, West Bengal, Telangana, Rajasthan, and Andhra Pradesh. Till 7<sup>th</sup> July 2020, Maharashtra has had 217121 confirmed coronavirus cases so far, and 118558 people have been cured and 9250 deaths [13]. In Maharashtra, Dharavi City, which is Asia's largest slum centre, has the highest number of COVID-19 cases and those who die from it [14].

### III. TRANSMISSION

An evaluation of COVID-19 cases suggests that the disease is spread primarily through person-to-person contact, as well as coughing, sneezing, or even exposure to talking drops by people infected with the virus. Fortunately, droplets containing the virus; typically do not float more than six feet and usually do not stay in the air for long. Virus secretion released in respiration from COVID-19 patients passes into the mucous membrane of healthy people. Transmission is also possible if a healthy person touches the surface exposed to infected droplets and then touches his/ her eye, nose, or mouth [15].

### IV. COMMON SYMPTOM

The most common symptoms seen in COVID-19 patient are fever, dry cough, and tiredness. Other symptoms that are less common and may affect some patients include aches and pains, nasal congestion, headache, conjunctivitis, sore throat, diarrhea, loss of taste or smell or a rash on skin or discoloration of fingers or toes. These manifestations are usually amiable and begin step by step. Some subjects become contagious but only have very amiable disease [16]. The Chinese Center for Disease Control and Prevention published a report of 72,314 cases, has demonstrated that the severity of clinical symptoms can vary among the individuals [17].

Mostly, 81% of patients were described as mild, i.e. non-pneumonia and mild pneumonia, recover from the disease without needing hospital treatment. 14% of cases were severe, i.e. dyspnea, respiratory frequency  $\geq 30/\text{min}$ , blood oxygen saturation  $\leq 93\%$ , arterial

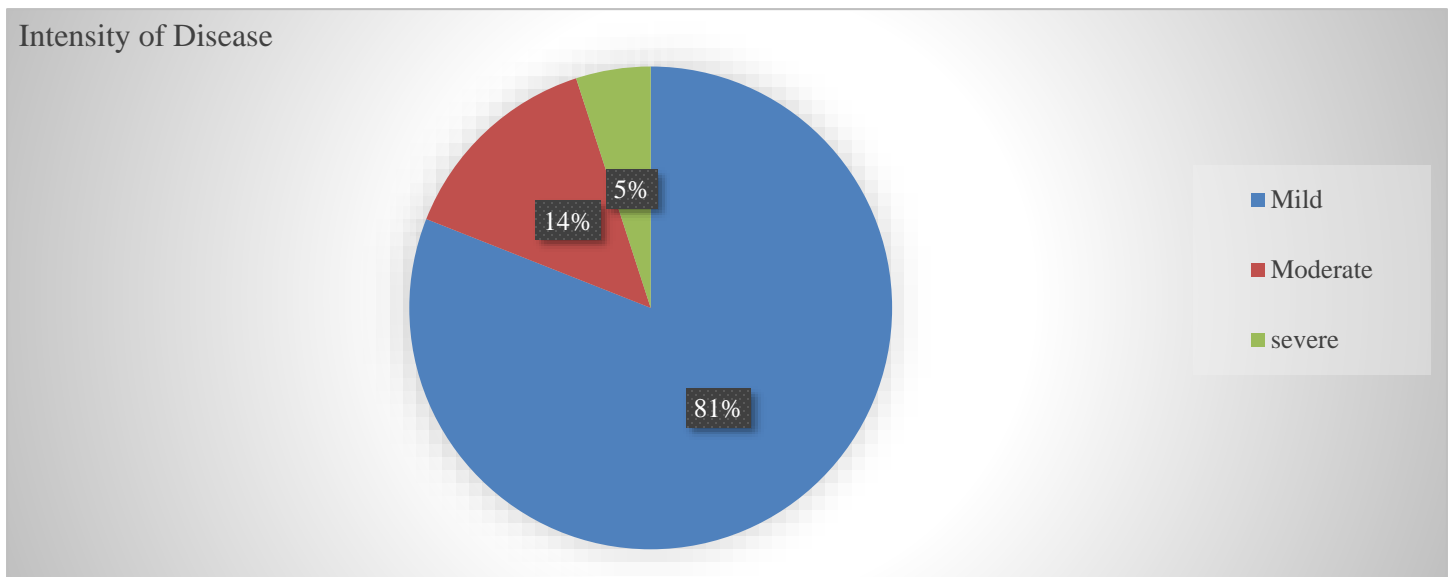


Figure 3: Intensity of Disease: In a study, 81% of COVID-19 patients were described as mild, i.e. non-pneumonia and mild pneumonia, recover from the disease without needing hospital treatment. 14% of cases were severe, i.e. dyspnea, respiratory frequency  $\geq 30/\text{min}$

oxygen partial pressure to inspired oxygen fraction ratio  $< 300$ , and/or lung infiltrates  $> 50\%$  within 24–48 h), 5% cases were critical, i.e. respiratory failure, septic shock, and multiple organ dysfunction or failure (fig. No. 3) [18].

### V. TREATMENT

There are no specific drugs, and vaccines developed for COVID-19 until now, but some antiviral drugs and other drugs have shown *in-vitro* activity against SARS-CoV-2 and are being used for treatment [19]. The treatment of COVID-19 is solely supportive of the vital organs and symptomatic to relieve the patients.

### 1. Antiviral Drug Therapy

Antiviral treatment is used for various viral diseases such as influenza. These drugs don't kill a virus but somewhat limits the production of new ones in host cells. Since the SARS-CoV-2 is a new one, therefore scant evidence related to specific antiviral drugs available that may work against it. Guidelines issued by China's National Health Commission for prevention, diagnosis and treatment of SARS-CoV-2 have included antiviral drugs such as lopinavir/ritonavir, interferon  $\alpha$  (IFN- $\alpha$ ), ribavirin, chloroquine phosphate, and arbidol in the latest version [19]. Doctors and scientists are looking at both existing and experimental antivirals to find effective treatments for this new disease. Some medicines, which are being used in COVID-19, are given below:

- A. Remdesivir** was initially developed for activity against the Ebola virus. Researchers are testing remdesivir to see how it might help patients with COVID-19, and results of some of these studies are available. The drug appears to be effective *in-vitro*, in protecting cells against infection by the SARS-CoV-2 (as is true of the SARS and MERS coronaviruses). Still, more investigations are underway to validate its efficacy. It was used in the first case of COVID-19 in the USA at Washington state, in January 2020. The case was critically ill but survived. Of course, activity in one instance does not establish the drug is powerful and active. Another two large randomised clinical trials are initiated in China. The two trials will enroll over 700 cases and are likely to definitively clarify the issue of whether the drug is efficient in treating COVID-19. Studies also are started in the United States, including at numerous Harvard-affiliated hospitals. It is troublesome to foretell when the drug could be recommended for use and manufactured in large quantities, assuming the clinical trials may symbolise that it is effective and trustworthy to treat infections [20].
- B. Lopinavir/Ritonavir** Lopinavir/Ritonavir primarily used against human immunodeficiency virus (HIV). It used in combination with other drugs in adults and children over 14 days of age who are infected with HIV. Chu et al. reported that lopinavir/ ritonavir shown anti-SARS-CoV activity *in vitro* and in clinical studies [21].
- C. Ribavirin** is a broad-spectrum antiviral drug that belongs to the nucleoside analogue category. A comparative study conducted on 111 patients with SARS treated with ribavirin monotherapy and 41 patients with SARS treated with lopinavir/ ritonavir and ribavirin; patients treated with the combined therapy had a lower risk of acute respiratory distress syndrome (ARDS) and death [21].
- D. Chloroquine** is a well known and widely used antimalarial drug. Its broad-spectrum antiviral potential was explored in 2006. Chloroquine has SARS-CoV-2 blocking ability at low-micromolar concentration [22].
- E. Arbidol** is used to treat influenza virus. It also effectively inhibit SARS-CoV-2 infection at a concentration of 10-30  $\mu\text{M}$  *in vitro* [19].

### 2. Convalescent plasma therapy

Convalescent plasma therapy uses a blood element called plasma, which comprises the virus-fighting antibodies. It is obtained from cases who have recovered from the infection and used in the treatment of COVID-19 patients who are severely ill. This will provide readymade immunity to COVID-19 patients.

There is no established therapy for Covid-19 in any country of the world, including plasma therapy. Plasma therapy is being investigated with, and there is no data to recommend it as a treatment. It is only at a preliminary experimental stage. If not

practiced accurately, it can generate life-threatening complexities", said Lav Agarwal, Joint Secretary Health Ministry, Government of India [23].

Several Covid-19 patients medical care centres in India are reported to have started banking plasma from coronavirus recovered patients after its use was said to have shown positive results. In Rajasthan, the first two cases of COVID-19 patients, who were given plasma at Sawai Singh Hospital, has shown signs of improvement [24]. There are some states Maharashtra, Uttar Pradesh, Madhya Pradesh and Rajasthan used plasma therapy trails. Delhi is the first state which started plasma bank for the COVID-19 patient's treatment and now applying on the patients of the same [25].

## VI. PREVENTION

To limit the cases of COVID-19, preventive measures are the prime and current strategy in adopted India. As long as the value of  $R_0$  is more than 1, the epidemic will continue to grow (COVID-19 is 2.2); therefore, the control measures should be focused on reducing the value to less than 1. Preventive strategies in India are mainly concentrated on quarantine measures and careful isolation of patients. The thorough and appropriate infection spread control measures should be adopted during the diagnosis and clinical care of an infected COVID-19 patient. For instance, droplet, contact, and airborne infection spread precautions should be taken during specimen collection; and sputum induction should be avoided. Lockdown adopted by all countries also falls under preventives strategies. In India, Prime Minister Narendra Modi implemented nation-wide lockdown in four-phase till May: lockdown firstly implemented on 23rd March 2020, and step-wise extended up to 31st May 2020, and in lockdown-3.0 and 4.0 some relaxations have been provided to run daily needs smoothly and to curb the spread of the new virus. Government of India sanctioned INR 15,000 crores COVID-19 Emergency Response and Health System Preparedness Package; INR 7,774 crores for immediate response and rest medium-term support (1-4 years), and issued the Containment Plan for COVID-19 with specially mentions about non-pharmaceutical interventions. (See Appendix -I, Preventive Measures implemented by Government of India on time to time [26]).

The WHO, other organisations and GoI have issued the following comprehensive preventive recommendations:

- Avoid intimate connection with patients suffering from acute respiratory plagues.
- Clean your hands regularly, particularly after meeting with infected personalities or their environment.
- Malinger unprotected touch with farm or wild animals.
- Subjects with manifestations of critical airway plague should keep their distance, close coughs or sneezes with throwaway tissues or clothes and clean their hands.
- Strengthen, in particular, in emergency medicine departments, the employment of strict cleanliness standards for the prevention and control of plagues.
- People who are immunocompromised should withdraw from frequent public meetings.

The most prominent strategy for the populous to undertake is to frequently clean their hands and utilise portable hand sanitiser and avoid touch with their face and mouth after combining with a possibly contaminated environment. Healthcare workers attending for infected people should employ contact and airborne anticipations to include PPE such as N95 or FFP3 masks, eye protection, gowns, and gloves to interrupt synchromesh of the pathogen.

## VII. RECOVERY

Those with a mild case of COVID-19 appear to recover within one to two weeks. For severe cases, recovery may take six weeks or more, and there may be lasting damage to the heart, kidneys, lungs and brain. About 1% of infected people worldwide will die from the disease [27]. As a result of adopting preventive and treatment measures, the recovery rate of COVID-19 patients is increased in the successive days (see fig. no. 4) [28].

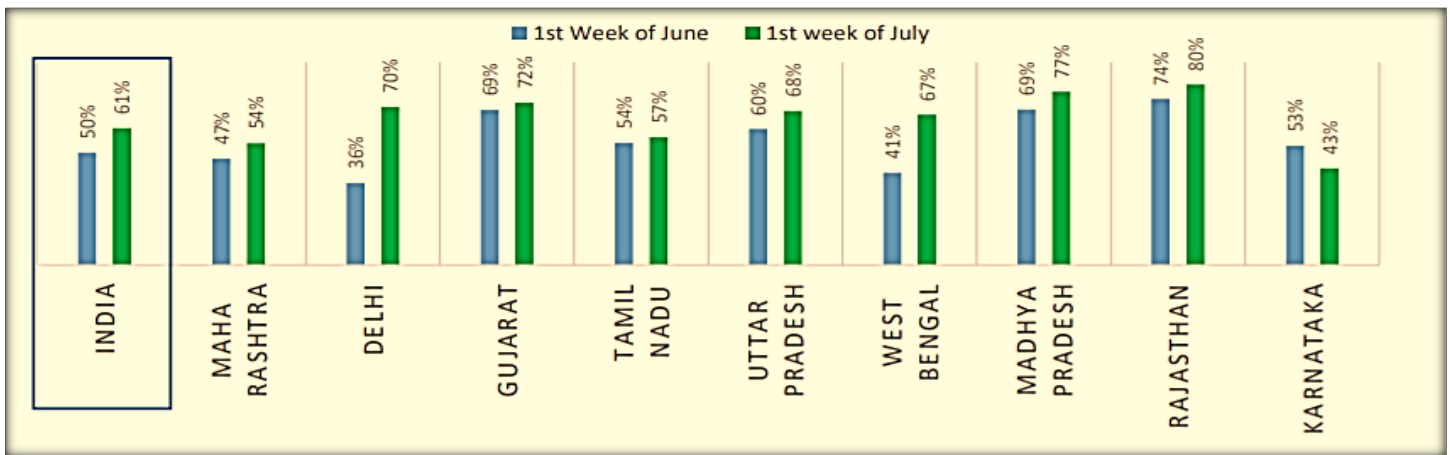


Figure 4: Recovery rate among confirmed cases across states with the highest COVID-19 burden (Source: Ministry of Health and Family Welfare, Government of India (MoHFW, GoI))

#### VIII. CONCLUSION

COVID-19 is a new virus disease. It will not be possible to tell at which peak it will stop. No more drugs and no vaccine has been retracted yet. Implementation and compliance with strict restrictions of social alienate as a preventive measure to clamp and mitigate the spread of COVID-19 will prove to be decisive in the months to come. Up-to-date, evidence-based guidelines for acute management of COVID-19 are obligatory to guide clinicians during the at full tilt transmogrify pandemic. Infectious disease monitoring and in careful, the appropriate detection and advanced warning of disease outbreaks are a function of strength and potential of the Indian health system. The need of the hour is to win the trust of people with a thoughtful approach, and this is possible only when health expenditure is increased as a higher percentage of GDP than before. As new evidence emerges, current and potential treatment options must be frequently re-evaluated to offer the best possible care under such unprecedented circumstances.

Appendix-I : Preventive Measures Implemented by Government of India (Source: ACAPS)

Date of Implementation/ Extension	Category	Measures	Remark
25/01/2020	Public health measures	Health screenings in airports & border crossings	screening for travelers from 2019-nCoV affected countries (China) at points of entry
		Strengthening the public health system	Establish In country/ community surveillance through the Integrated Disease Surveillance Programme network (IDSP)
26/02/2020	Movement restrictions	Isolation & quarantine policies	Indian citizens are advised to refrain from travel to China. People travelling to China henceforth will be quarantined on return. Indian citizens are advised to refrain from non-essential travel to Singapore, Republic of Korea, Iran, & Italy. People coming from Republic of Korea, Iran & Italy or those having history of travel to these countries may be quarantined for 14 days on arrival to India.
		Visa restrictions	Existing visas (including e-Visa already issued) of those traveling from China to India are no longer valid for any foreign national travelling from China.
05/03/2020	Social distancing	Limit public gatherings	Advisory against mass gatherings
	Public health measures	Health screenings in airports & border crossings	Health screens at border crossings
10/03/2020	Movement restrictions	General recommendations	Indian citizens are advised to avoid non- essential travel abroad. They are further strongly advised to refrain from travelling to China, Italy, Iran, Republic of Korea, Japan, France, Spain & Germany.
		Additional health/documents requirements upon arrival	Incoming travelers having visited Italy or Korea to produce negative COVID-19 health certificate
		Visa restrictions	All regular Visas (including e Visas) which have been granted to nationals of France, Germany & Spain on or before 11.03.2020 & where these foreigners have not yet entered India stands suspended. Suspension of all visas except diplomatic, official, UN, employment & project until April 15th
11/03/2020		Border checks	International traffic through land borders will be restricted to designated check posts with robust screening facilities.
13/03/2020	Public health measures	Health screenings in airports & border crossings	Intensified health inspections at all these entry points. Subject to quarantine if symptomatic.
		Isolation & quarantine policies	Incoming travelers (including Indians) have visited China, Italy, Iran, Republic of Korea, France, Spain & Germany after 15th February, 2020 quarantine 14 days
14/03/2020	Governance & socio-	Emergency administrative	Invoking use of emergency protocol & funds



	economic measures	structures activated or established	
15/03/2020		Economic measures	Assistance to COVID-19 victims & families of deceased
	Movement restrictions	Border closure	temporary closure of specified Indian land border crossings with Bangladesh, Nepal, Myanmar & Bhutan until 15 April
16/03/2020	Lockdown	Partial lockdown	closure of selected public institutions such as museums (incl. Taj Mahal) until March 31 & postponement of several local elections
18/03/2020	Movement restrictions	Visa restrictions	ban of entry for passengers from EU countries, EFTA countries, Turkey, UK from 18 March
		Isolation & quarantine policies	Introduction of quarantine policies for travelers expanded to those coming or transiting from UAE, Qatar, Oman, Kuwait starting 18 March until 31 March
20/03/2020	Public health measures		All asymptomatic individuals who have undertaken international travel in the last 14 days should stay in home quarantine for 14 days, be tested only if symptomatic, & all family members living with a confirmed case should be quarantined.
		Testing policy	Testing all symptomatic contacts of laboratory confirmed cases, symptomatic health care workers, & all hospitalized patients with Severe Acute Respiratory Illness.
	Social distancing	Schools closure	Until March 31, 2020
24/03/2020	Lockdown	Full lockdown	Complete lockdown of entire nation for 21 days. Agriculture-Farming & allied activities exempted from Lockdown
			Deploy fiscal resources for additional medical facilities, central instruct state government
26/03/2020	Governance & socio-economic measures	Economic measures	Govt asks distilleries / sugar mills to maximize manufacture of hand sanitizers
			Relief Package towards responsive Governance in Challenging Times Which Will Provide Relief to Vulnerable Sections
30/03/2020			Govt gives benefits to farmers on crop loan repayments due to Covid-19 lockdown
02/04/2020	Public health measures	Strengthening the public health system	adopt community-approach in the battle against the pandemic
03/04/2020			Advise religious leaders to not hold any congregations/ functions
03/04/2020	Social distancing	Limit public gatherings	extended the period of completion of election including postponing the date of poll & counting concerning elections to the Council of States, since the electoral process necessarily involves movement & gathering of polling officials, agents of political parties, support officials & members of respective Legislative Assemblies on the poll day, which may put public safety at risk & create public health hazard.
04/04/2020	Lockdown	Partial lockdown	More lockdown relaxations for Agriculture-Farming sector
	Public health measures	Awareness campaigns	Manual on Home Made Masks to prevent COVID-19
		Economic measures	CBDT issues orders u/s 119 of IT Act,1961 to mitigate hardships to taxpayers arising out of compliance of TDS/TCS provisions
09/04/2020	measures		COVID-19 Emergency Response & Health System Preparedness Package Posted On: 09 Apr 2020
16/04/2020	Public	Other public	MoS Agriculture, Shri Kailash Choudhary inaugurates Pusa Decontamination & Sanitizing Tunnel

	health measures	health measures enforced	
17/04/2020	Governance & socio-economic measures	Military deployment	Armed Forces Medical Services deployed
18/04/2020		Economic measures	Amends the extant FDI policy for curbing opportunistic takeovers/acquisitions of Indian companies due to the current COVID-19 pandemic
19/04/2020	Public health measures	Strengthening the public health system	Government launches online data pool of critical human resource for combating & containing Covid-19
21/04/2020	Movement restrictions	Surveillance & monitoring	launches 'COVID India Seva', an interactive platform for citizen engagement on COVID-19 Po
	Lockdown	Partial lockdown	In-house Care-givers of Senior Citizens, Prepaid mobile recharge utilities, Food processing units in urban areas exempt from Lockdown Restrictions to fight COVID-19 Post
22/04/2020	Public health measures	General recommendations	Advisory against spraying of disinfectant on people for COVID-19 management
24/04/2020	Movement restrictions	Surveillance & monitoring	COVID-19 GIS Dashboard: This is a location-based information system used to geotag - people who are home quarantined (purple colour dots on map), last location of COVID-19 positive persons (Red Drop Marks), Area Cordoning (Black lines), Lane closure, etc.. Once a patient is found to be COVID-19 positive, his/her last location of stay is marked on the dashboard. Similarly, all home quarantined persons are marked on the map. This information is used to generate a heat map which helps classify areas from low risk to high risk. This dashboard is also used to identify epicentres of COVID-19 cases which helps the Health Department to identify locations for immediate spraying of disinfectants.
25/04/2020	Lockdown	Partial lockdown	MHA allows opening of certain categories of shops. In rural areas, all shops, except those in shopping malls are allowed to open. In urban areas, all standalone shops, neighborhood shops & shops in residential complexes are allowed to open. Shops in markets/market complexes & shopping malls are not allowed to open. It is clarified that sale by e-commerce companies will continue to be permitted for essential goods only.
26/04/2020	Governance & socio-economic measures	Economic measures	States promotes the concept of 'Direct marketing' to facilitate farmers/ group of farmers/FPOs/ Cooperatives in selling their produce to bulk buyers/big retailers/processors etc.
27/04/2020			Gov is focusing on easing policy & implementation bottleneck to supply chains of essential items
28/04/2020			\$1.5 billion loan to support government's response to COVID-19 pandemic
	Rs. 50 lakh compensation for Port employees/workers, in case of loss of life from COVID-19		
29/04/2020	Public health measures	Isolation & quarantine policies	Guidelines issues for home isolation of very mild / pre-symptomatic patients
		Strengthening the public health system	HCARD, a robot, to assist frontline COVID-19 healthcare warriors
		Awareness campaigns	a dash board about COVID-19 situation in KDMC area is now available in public domain. The page has been linked with the website of municipal corporation, & other social media handles of city government (such as Facebook, Twitter, Instagram), & is open for viewing by public. ashboard can be accessed at <a href="https://kdmc-coronavirus-response-skdc1.hub.arcgis.com/">https://kdmc-coronavirus-response-skdc1.hub.arcgis.com/</a>
30/04/2020	Governance & socio-	Economic measures	Reimbursement of OPD medicines to CS (MA) beneficiaries: Special Sanction in view of COVID-19 reg.

	economic measures		
01/05/2020	Public health measures	Strengthening the public health system	Additional guidelines on rational use of Personal Protective Equipment (setting approach for Health functionaries working in non-COVID areas)
03/05/2020	Movement restrictions	Domestic travel restrictions	Railways only accepting passengers BROUGHT & FACILITATED by State Governments.
04/05/2020	Lockdown	Partial lockdown	Extension of Lockdown for a further period of Two Weeks with effect from May 4, 2020
	Public health measures	Awareness campaigns	raise awareness for blood donation
	Governance & socio-economic measures	Economic measures	measures for livelihood & security of tribal gatherers & artisans in the backdrop of situation arising out of COVID-19
	Social distancing	Closure of businesses & public services	Civil Services (Preliminary) Examination, 2020, scheduled on 31st May deferred: Taking notice of the extension of restrictions, the UPSC has decided that it will not be possible to resume examinations & interviews for the present. The Civil Services (Preliminary) Examination, 2020, scheduled to be held on May 31, 2020 therefore stands deferred.
06/05/2020	Movement restrictions	Visa restrictions	All existing Visas granted to Foreigners, except certain categories, to remain suspended till the Prohibition on International Air Travel of passengers from/to India is lifted
08/05/2020	Governance & socio-economic measures	Economic measures	The Government of India & the Asian Infrastructure Investment Bank (AIIB) signed a US\$ 500 million “COVID-19 Emergency Response & Health Systems Preparedness Project” today to help India to respond to the COVID-19 pandemic & strengthen its public health preparedness
10/05/2020	Public health measures	Strengthening the public health system	Adequate health infrastructure & health facilities set up for COVID-19 management. Adequate health infrastructure & health facilities have been identified & set up for COVID-19 management in the country.
11/05/2020	Governance & socio-economic measures	Emergency administrative structures activated or established	Union Ministry of Home Affairs has issued detailed guidelines under the Disaster Management Act, 2005, on restarting manufacturing industries after the lockdown period.
12/05/2020	Movement restrictions	Domestic travel restrictions	Passenger services on Indian Railways shall be partially restored w.e.f. from 12th May 2020 in a graded manner
13/05/2020	Governance & socio-economic measures	Economic measures	special economic package of Rs 20 lakh crore. Finance Minister announce measures for relief & credit support related to businesses, especially MSMEs to support Indian Economy’s fight against COVID-19.
15/05/2020			short term & long-term measures for supporting the poor, including migrants, farmers, tiny businesses & street vendors
			Interest subvention on Working Capital Loans for Dairy sector due to lockdown
	Public health measures	Other public health measures enforced	sensor-based service delivery monitoring system in rural drinking water sector under Jal Jeevan Mission. Owing to the current situation of CoVid-19 pandemic, water has to be made available for all.
17/05/2020	Governance & socio-	Economic measures	Structural reforms across Eight Sectors

	economic measures		
	Movement restrictions	Surveillance & monitoring	National Migrant Information System (NMIS) - a central online repository on Migrant Workers - developed by NDMA to facilitate their seamless movement across States. It has additional advantages like contact tracing, which may be useful in overall COVID-19 response work.
18/05/2020	Lockdown	Partial lockdown	Extension of Lockdown up to May 31, 2020; States to decide various Zones & Activities to be allowed in these Zones; Certain activities to remain prohibited throughout the Country
	Public health measures	General recommendations	New normal Instructions
01/06/2020	Movement restrictions	Domestic travel restrictions	Indian Railways will start operations of 200 passenger services as listed in the annexure. These trains shall run from 1/6/2020 & booking of all these trains will commence from 10 am on 21/05/20
21/05/2020			amended the guidelines on lockdown measures to fight COVID-19, so as to facilitate domestic air travel for stranded persons in India.
24/05/2020	Governance & socio-economic measures	Economic measures	extension of validity of fee payment & extension of time period for paying fees as mandated under rule 32 & 81 of Central Motor Vehicle Rules 1989
25/05/2020			Prices of N-95 Masks are getting reduced by the Importers/ Manufacturers/Suppliers of N-95 Masks after an Advisory issued by NPPA
26/05/2020		Emergency administrative structures activated or established	validity of approval or certifications of hotels & other accommodation units whose project approvals/reapprovals & classification/reclassification have expired/are likely to expire during the period (24.03.2020 to 29.6.2020) are deemed to be extended till 30.06.2020
29/05/2020	Movement restrictions	Surveillance & monitoring	IT initiatives to fight COVID-19. SMC has developed SMC COVID-19 Tracker System which includes a web portal & Mobile application named "SMC COVID-19 Tracker" to track people who have abroad or interstate travel history & persons who have come in direct contact with positive COVID-19 individuals.
30/05/2020	Public health measures	Strengthening the public health system	Scaling up of COVID testing centres (Hub & spoke model) in National research laboratories & Universities
03/06/2020	Movement restrictions	Visa restrictions	Relaxation in Visa & Travel restrictions to permit certain categories of Foreign Nationals to come to India
04/06/2020		Surveillance & monitoring	Delhi to conduct contact tracing
		Testing policy	Delhi to ramp up testing
13/06/2020	Public health measures	Strengthening the public health system	Updated clinical management protocol for COVID-19
15/06/2020	Lockdown	Partial lockdown	Total lockdown from 19th to 30th June in Chennai, Thiruvallur, Kanchipuram, & Chengalpattu districts
18/06/2020	Public health measures	Strengthening the public health system	Launch of India's first mobile lab for testing remote parts of the country

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