

## Prediction Strategies and Challenges of Third Wave of Covid 19

Karuna Priya Chitra

Submitted: 01-12-2021

Revised: 11-12-2021

Accepted: 14-12-2021

SARS-CoV-2 virus causes an infectious disease called Corona virus disease (COVID-19) mild to moderate symptoms were experienced in most people who fall sick with COVID-19 will and recover without special treatment. However, some will become seriously ill and require medical attention. The third wave has been predicted to hit India and other countries within in next few months. South Korea has experienced three waves of Covid -19 pandemic. The information about the disease was insufficient to stop the first wave in February –April-2020 and it was an outbreak related to religious groups in a situation. With increase in social activity and poor social distancing the second wave started, the spread was mitigated successfully by rapid strengthening of social distancing policies during the early stages of the second wave but not during the third wave.

WHO is issuing the COVID-19 Strategic Preparedness and Response Plan (SPRP) for 2021 and accompanying documents as a package aimed at guiding the coordinated action that we must take at national, regional, and global levels to overcome the ongoing challenges in the response to COVID-19, address inequities, and plot a course out of the pandemic<sup>1</sup>

Hence the Government of India needs to take immediate and stringent public health measures to regulate and possibly avert the predicted third wave of COVID-19. The Six-point strategy that needs to be implemented has been delineated below

1. High Vaccination Coverage worldwide  
To ensure Covid-appropriate behaviour till February next year our Government and experts have urged citizens to be fully vaccinated. The immunization programme has already boosted by The Government of India (administered 472.22 million doses) as on August 3, 2021

2. Immunity Boosters  
Immune Boosters like Zinc, Vitamin–C, Vitamin – D, Calcium has been used as treatment option for Preventing moderate to severe symptoms of Covid-19.

Citrus Fruits, Turmeric, Tulsi, pepper, Ginger, Mexican Mint, Honey, Eggs, Soups, Nuts were used as alternative remedies in India as well as other countries

### 3. Gathering Restrictions

The people need to comply with the protocols for the prevention of the COVID-19 and avoid unnecessary travelling in this situation. The government should also put a ban on tourist places, Swimming Pools, Malls, Theatres picnic spots etc. an amenable inclination of the public can drive the country towards a safe and COVID-free stature along with an efficient strategic initiatives by the government

### 4. Improved Genomic Monitoring

5. When an animal or person is infected the changes in the genetic code of a virus that naturally occur over time. Key mutation(s) that happen in important regions of the genome has to be monitored in circulating viruses. As they do not alter the major proteins involved in infection almost many mutations do not affect the virus's ability to spread or cause disease. Variants with mutations will be outcompeted by that are more beneficial for the virus<sup>2</sup>.

### The value of genomic surveillance<sup>3</sup>

The value of monitoring for infectious agents has proved by the advanced field of genomic surveillance, the COG-UK consortium although it remains impossible to predict what the virus will do in future, real-time epidemiological information, just 18 months after its inception, has been provided to inform the UK's public health response,.

an outbreak unfold watched by these genomic surveillance data, which has given information a lot about how a new infectious agent spreads and evolves

More genomic surveillance programmes has to be developed across the world, so that we are as well-prepared as we can to respond to future infectious variant outbreaks

**Currently designated Variants of Concern (VOCs):**

WHO label	Pango lineage*	GISAID clade	Nextstrain clade	Additional amino acid changes monitored°	Earliest documented samples	Date of designation
<b>Alpha</b>	B.1.1.7	GRY	20I (V1)	+S:484K +S:452R	United Kingdom, Sep-2020	18-Dec-2020
<b>Beta</b>	B.1.351	GH/501Y.V2	20H (V2)	+S:L18F	South Africa, May-2020	18-Dec-2020
<b>Gamma</b>	P.1	GR/501Y.V3	20J (V3)	+S:681H	Brazil, Nov-2020	11-Jan-2021
<b>Delta</b>	B.1.617.2	G/478K.V1	21A, 21I, 21J	+S:417N	India, Oct-2020	VOI: 4-Apr-2021 VOC: 11-May-2021

**Variants of Interest (VOI)**

**Working definition**

A SARS-CoV-2 variant:

- virus characteristics such as transmissibility, disease severity, immune escape, diagnostic or therapeutic escape could be predicted with the genetic changes **Currently designated Variants of Interest (VOIs):**

WHO label	Pango lineage*	GISAID clade	Next strain clade	Earliest documented samples	Date of designation
<b>Lambda</b>	C.37	GR/452Q.V1	21G	Peru, Dec-2020	14-Jun-2021
<b>Mu</b>	B.1.621	GH	21H	Colombia, Jan-2021	30-Aug-2021

**Variants under Monitoring (VUM)**

**Working definition**

**Evidence of phenotypic or epidemiological impact is currently unclear. A SARS-CoV-2 variant with genetic changes that are suspected to affect virus characteristics**

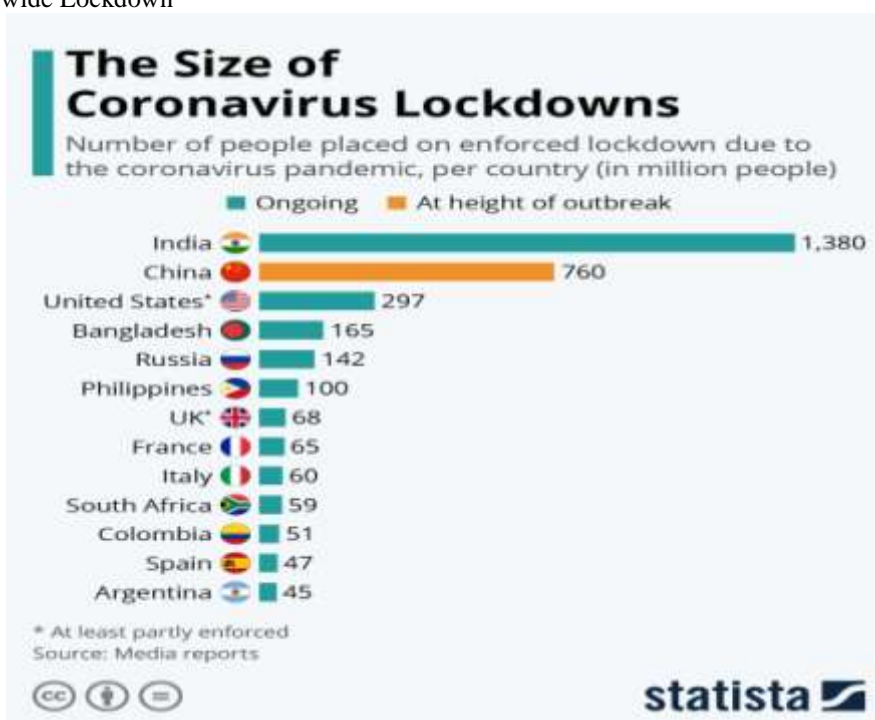
Note: It is expected that our understanding of the impacts of these variants may fast

evolve, and designated Variants under Monitoring may be readily added/removed; therefore, WHO labels will not be assigned at this time. Former VOIs/VOCs may, however, be monitored for an extended period under this category, and will maintain their assigned WHO label until further notice.

Currently designated Variants under Monitoring

Pango lineage*	GISAID clade	Next strain clade	Earliest documented samples	Date of designation
AZ.5 <sup>#</sup>	GR	-	Multiple countries, Jan-2021	02-Jun-2021
C.1.2	GR	-	South Africa, May 2021	01-Sep-2021
B.1.617.1 <sup>§</sup>	G/452R.V3	21B	India, Oct-2020	VOI: 4-Apr-2021 VUM: 20-Sep-2021
B.1.526 <sup>§</sup>	GH/253G.V1	21F	United States of America, Nov-2020	VOI: 24-Mar-2021 VUM: 20-Sep-2021
B.1.525 <sup>§</sup>	G/484K.V3	21D	Multiple countries, Dec-2020	VOI: 17-Mar-2021 VUM: 20-Sep-2021
B.1.630	GH	-	Dominican Republic, Mar-2021	12-Oct-2021

6. State wide Lockdown<sup>o</sup>



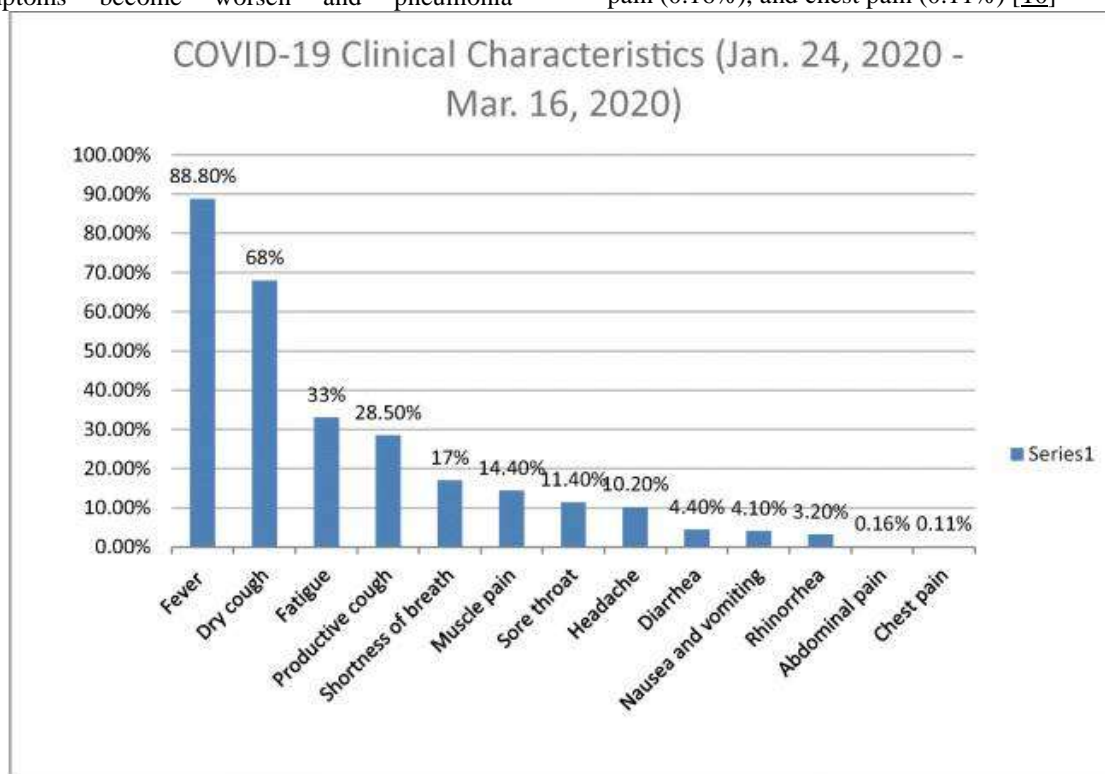
7. Scrutiny on Co morbidities  
**Presence of Comorbidities and the Clinical Characteristics and Outcomes of COVID-19<sup>4</sup>**

**Clinical Characteristics**

Mild complaints, such as fever and cough, to more critical cases associated with difficulty in breathing [7] were noticed in Confirmed and reported cases of COVID-19. Some of the most common symptoms include sore throat, unexplained loss of taste or smell, diarrhea, and headache cough, fever, chills, shortness of breath (SOB), muscle aches[8]. Within 5 -7 days symptoms become worsen and pneumonia

develops in patients [8]. Difficulty in breathing could be seen in 1 in 6 patients and become seriously ill especially elders [9].

A meta-analysis study of COVID-19 patients, as depicted in Fig. 1, showed fever (88.8%) as the most common symptom, followed by dry cough (68%) and fatigue (33%) [10]. Other symptoms noted were productive cough (28.5%), SOB (17%), muscle pain (14.4%), sore throat (11.4%), and headache (10.2%) [10]. The least common symptoms were diarrhea (4.4%), nausea and vomiting (4.1%), rhinorrhea (3.2%), abdominal pain (0.16%), and chest pain (0.11%) [10]



**Note:** Data obtained from Research Square, a meta-analysis of the 2019 novel coronavirus, showing clinical characteristics observed in patients, as of April 8, 2020<sup>10</sup>.

**Comorbidities**

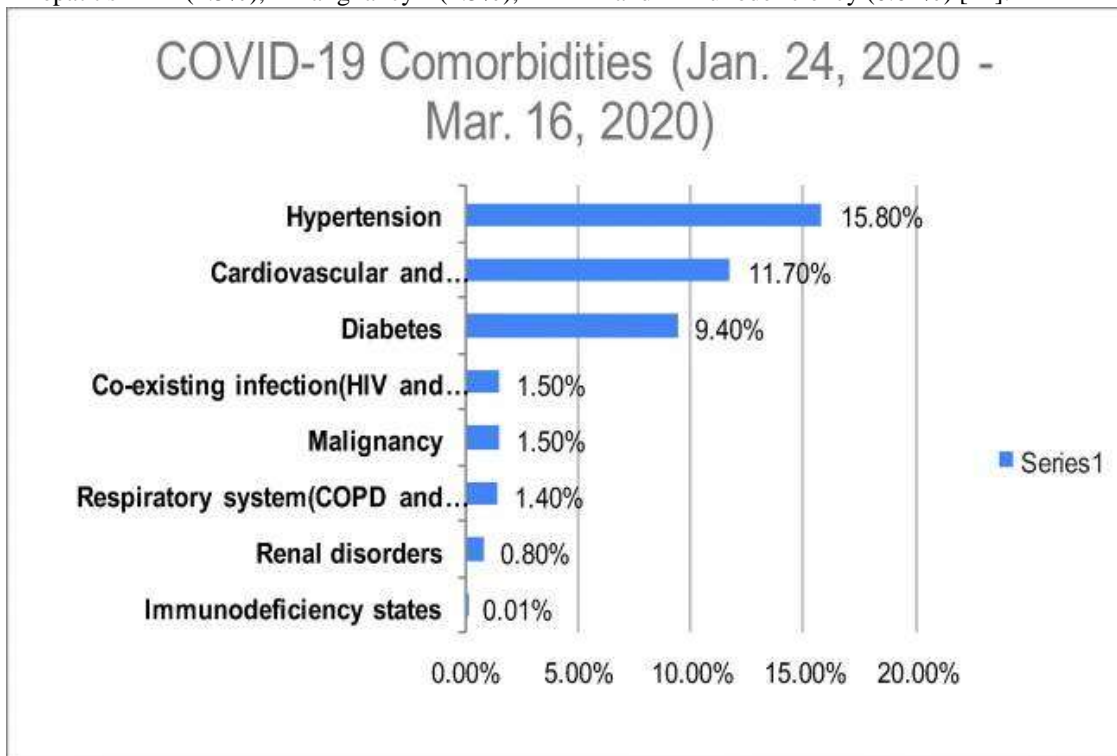
The data available is limited as COVID-19 being a relatively new and understudied disease, it was observed that comorbidities increase the chances of infection [7]. From the cases that emerged, people of all ages with serious underlying medical conditions are at a greater risk of getting COVID-19 [7]. The elderly with chronic health conditions such as diabetes and cardiovascular or lung disease are at high risk of falling ill and death [10]. patients on steroids chronically are at increased risk of COVID-19 infection and

underlying uncontrolled medical conditions such as diabetes; hypertension; lung, liver, and kidney disease; cancer patients on chemotherapy; smokers; transplant recipients are at high risk; [7].

A meta-analysis study on COVID-19 comorbidities, as depicted in Fig. 2, had a total of 1786 patients, of which 1044 were male and 742 were female with a mean age of 41 years old [101]. The most common comorbidities identified in these patients were hypertension (15.8%), cardiovascular and cerebrovascular conditions (11.7%), and diabetes (9.4%) [10, 17]. The less common

comorbidities were coexisting infection with HIV and hepatitis B (1.5%), malignancy (1.5%),

respiratory illnesses (1.4%), renal disorders (0.8%), and immunodeficiency (0.01%) [11].



**Note:** Data obtained from Research Square, a meta-analysis of the 2019 novel coronavirus, showing clinical comorbidities observed in patients, as of April 8, 2020<sup>10</sup>.

#### 7. Restricting Abroad Travelling

Severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) causes the second wave of corona virus disease 2019 (COVID-19) and India has barely recuperated from this infection [1,2] and has reached a peak of 414,188 cases (300.13 per million) on May 6, 2021

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