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COVID-19 Pandemic in India: First Wave v/s Second Wave

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ABSTRACT

Coronavirus is related to a group of RNA viruses, which is a deadly disease having a disastrous impact worldwide. On March 11, 2020, the unconventional coronavirus sickness (covid-19) became defined as a virulent disease by means of international fitness corporation WHO. This disorder is highly epizootic when compared to influenza and such cluster outbreaks often arise. Lamentably, COVID-19 sufferers show signs and symptoms like common cold. Evaluating all the events during COVID to different respiratory illnesses, which includes influenza, SARS, and MERS, to check whether they are present otherwise, it is anticipated that, influenza starts off with cough, while corona virus-related disorder begins with fever. Although COVID-19 varies from SARS as well as MERS in terms of gastrointestinal symptoms. COVID is the fastest growing human race fitness worldwide, not only socially but also economically. Among the major concerns of the coronavirus epidemic were a significant decline in profit and transportation services, an increase in unemployment, and the closure of business sectors. In addition, central governments in the international arena have reduced the risk of the spread of COVID-19 and are generally responding to disasters in their countries. Since the spread of this pandemic is unlikely to decrease in the near future, due to mutations in genome of virus. Hence preventive measures are essential to save lives and economic well-being from further spread to humans. Current work, which is based solely on available information and the available literature, discusses various factors that contribute to the consequences of COVID-19 in humans at specific age, social and economic levels during first wave and second wave.

Key words: *Covid-19, Influenza, MERS, Outbreak, Pandemic, Respiratory diseases, SARS*

Introduction

The name COVID-19 comes from Corona Virus Disease and 19 indicates the year the infection began (2019). The epidemic originated in December from the city of Wuhan in the Hubei region of China. It belongs to the RNA virus, which is about 80–120 nm in size. COVID-19 disease is spreading rapidly around the world. The WHO classified the coronavirus as an epidemic on March 11, 2020. The World Committee on the Classification of Viruses (ICTV) has identified the virus as SARS-CoV-2 (acute respiratory syndrome-Coronavirus-2). COVID-19 affected the normal existence of humans and damaged the worldwide economy. The epidemic has also affected the social life of people

around the world. According to the report, pollution has spread to approximately 213 international locations worldwide and has had serious impacts on the economic and health infrastructure of countries. Most of the nations locked their centers, services, educational institutes, industrial sectors, and everyday marketplaces to save people from spreading these infections. The exceptional business sectors and trades are critically impacted via the contamination. Aside from those some tremendous influences and worries over the economic system, healthcare services and social existence (Mishra *et al.,* 2020).

The virus has induced numerous infections and mortalities across the globe. The primary case in India came into knowledge on January 30, 2020 (Shetti *et al.,* 2020). India with a population of over 1.34 billion - the second largest country on the planet, is struggling to control the spread of the deadliest coronavirus in its population. Some strategies have been followed to control the spread. They include computational modeling, statistical gear and quantitative analysis and control of appearance and quick fixes. The Ministry of Fitness and Family Welfare of India is aware of the latest outbreak and has taken important steps to control the outbreak. To achieve this goal, the primary and state governments have taken a number of measures and formulated several wartime protocols. The disease is highly contagious compared to influenza, cough, fever, nausea, and diarrhea are primarily based on clinical observations of Covid's examples to establish the highest range of recognizable signals known as the primary wave of covid-19 (Larsen *et al.,* 2020). The virus is rapidly evolving, and new variants have been discovered, with more advanced and unusual symptoms observed in recently infected patients. However, the classic symptoms of COVID-19 are fever (with or without cold), cough, shortness of breath, headache, sore throat, body aches, loss of taste or smell, nasal congestion, fatigue, and muscle cramp pain. Although the depth of breathing may vary between individuals, this symptom is characterized by tightness in the chest in most patients, which occurs every few seconds, inside the normal airway, called COVID-19, called the second wave (Shikha Desai *et al.,* 2020). Some children have symptoms of irritation throughout the body, periodically after several weeks they become inflamed by the virus. This is called Multisystem Inflammatory Syndrome (MIS-C) in children. Doctors are examining how these signs are linked to coronavirus infection (Jonathan *et al.,* 2020).

Signs beyond viral clearance appear in post-covid disorder syndrome and exacerbate chronic diseases within one month after initial scientific and virological treatment of the disease with glare improvement in symptoms or viral etiology. Our goal is to identify events, affiliations, and opportunities for the development of Submit-Kovid-19 syndrome (Mahmud *et al.,* 2021).

Background

The **covid-19** outbreak became first pronounced in December 2019, in Wuhan metropolis, China. Therefore, the inflamed patients were recognized with signs of immoderate breathing ailment, headache, fatigue, throat pain, moderate fever (Wu *et al.,* 2020; Shetti *et al.,* 2020). Earlier there are also a few viruses which affected the arena badly like smallpox, influenza, yellow fever, dengue etc. **Smallpox** was the first viruses which infected people lots of years ago. Human beings have been no longer capable of locate any therapy they did no longer had any natural resistance to the virus. Hundreds of thousands of people died, because of this Edward Jenner and Louis Pasteuradvanced vaccines for the primary time to defend in opposition to viral infections. After that **Rabies** is a sickness caused due to infection in mammals by rabies virus. It has been known for over 4000 years. Rabies develops if a person gets a bite from an inflamed animal. Due to the fact the saliva of the infected animal consists of poison or slime which can lead to dying. It additionally took thousands of lives; later Louis Pasteur made a vaccine from the puppies which have been dying because of rabies. **Measles** became first pronounced in 1765 it additionally killed lots of humans with signs red eyes, rashes, watery eyes, high fever and so on. Throughout the second war (1899"1902), measles become widespread among the prisoners within the British camps and accounted for hundreds of deaths [A History of measles in the United States, 2019]. **Poliomyelitis** or polio is also an epidemic came in mid-20th century which is an acute paralytic ailment. The sickness resulted from lower motor neuron damage and is characterized by way of uneven persisting weakness (flaccid paralysis) was controlled using formalin-inactivated salk polio vaccine (IPV) and the Sabin oral polio vaccine (OPV) (Baicus *et al.,* 2012). 1918 influenza pandemic turned into the most intense pandemic. It changed due to an H1N1 virus

with genes of avian beginning. It unfolded globally all through 1918-1919 history of Flu Pandemic. **Yellow fever** changed into the most notorious ailment because of a virus named flavivirus. The epidemic within US occurred in the year 1905. For the duration of the constructing of Panama Canal heaps of people died of ailment. The very first epidemic in Africa came in Ghana in 1926 (Gardner *et al.*, 2010). **Hepatitis virus** is a sickness of liver, signs and symptoms include yellowing of the pores, skin, eyes, body fluids and jaundice. It had spread among napoleon's armies and during the most important conflicts of 19th and 20th centuries, including the American civil warfare, wherein more than 40,000 instances and approx. 150 deaths have been stated. The 1968 flu also called **hong Kong flu** was an international influenza virus outbreak that originated in Asia. The pandemic was caused by the H3N2 subtype of the virus — believed to have progressed from a previous outbreak of influenza in 1957. The virus has taken over 1,000,000 people. **AIDS (2005–2012)** is an autoimmune disease caused by the human immunodeficiency virus, first diagnosed in 1976 in the Republic of Congo. However, it did not develop. The epidemic affected large parts of the African continent until it peaked between 2005 and 2012. The sexuallytransmitted virus has killed more than 35 million people in their lifetime (Fajardo-Ortiz, *et al.*, 2017). 2015 Indian swine flu outbreak indicates the spread of H1N1 virus in India in early 2015. 937 cases and 218 deaths were reported during the year. Various laboratories have shown that the number of cases has crossed 33,000 with a mortality rate of over 2,000 (Rewar *et al.*, 2015). **Nipah virus** is one of the rising distinctly pathogenic viruses. Like Ebola and Zika viruses, Niv too is threatening the integrity of the mankind. The family *Paramyxoviruses* has been traditionally related to a group of viruses with slender host variety and typically reasons outbreaks with low mortality rates (Prarthana *et al.*, 2018). These are a few examples of viruses which affected the sector completely and destroyed the lives of people.

Strategies Implemented Against Pandemic Crisis

Strategies to control the spread include screening, prevention (or suppression) and mitigation. Screening is done using a thermometer / temperature gun to detect high body temperature due to coronavirus. Prevention usually takes place at an early stage to identify and isolate infected people and to initiate alternative therapies to prevent the spread of the disease. When it is impossible to control the disease, the focus is on mitigation: taking steps to reduce the spread and its impact on the health care system and society. Suppression requires drastic action to control the infection by reducing the rate of reproduction.

Emancipating Humans Proactively to Combat Covid-19

It is crucial to guard human beings, particularly running magnificence as well as daily wage people from the infection and all through these circumstances' civilians dwelling in potential threat territories had been advised to stay at home, which is a mandatory manner to obstruct the transmission. To begin with, personnel and volunteers who confirmed symptoms were actively taken for prognosis and screening process to test the presence of contamination. These diagnostic measures helped in providing the actual cases and arranging suitable measures via administrations. At the same time, medical professionals restrained to clinical specialists had been buckled down to display screen the speculated instances, do not forget the affirmed instances, and take powerful measures to stop critical sufferers.

Outbreak of Covid-19 During First Wave

Covid-19 has affected the ordinary human life and has obstructed the economy worldwide. Additionally, the pandemic impacted social existence of people all over the world. The infection has now unfolded throughout the globe, almost affecting 213 international locations, and confirmed severe implications over international locations financial and health structures.

First Wave Hitting India

The spread of corona virus in India during first wave and second wave were very different. Although the disease was relatively new and vaccines were by our side, millions of people wereinfected and suffered from side effects. Although it was not a high mutation genetic infection or proper COVID behavior the second wave of infection is much more contagious than the first. Symptoms also changed and the difficulty increased.

Symptoms

Symptoms vary from mild to severe. Humans with

Figure 1. Symptoms of COVID-19 (Figure 1: Poongodi *et al.*, 2021)

the same infection may also have different signs and symptoms and their signs and symptoms may also vary over the years. Three groups of signs and symptoms were diagnosed: first respiratory symptom with cough, shortness of breath, sputum and fever (Figure 1).

The second is a musculoskeletal symptom with muscle and joint pain, fatigue and headache. A third group of digestive signs and symptoms with abdominal pain, nausea and diarrhea. 81% of the symptoms are visible extend only to mild to moderate symptoms, while 14% of hypoxia, dyspnea, or pulmonary involvement increase the severity of imaging by more than 50%, and another 5% experience vital signs such as respiratory failure, surprise, or multiple organ failure. One-third of people infected with the virus show no symptoms for a period of time. Those asymptomatic carriers are no longer screened and may express disease. Humans with various inflammations may later develop symptoms called pre-existing symptoms or have very few signs and symptoms and may express the virus.

The incubation period for COVID-19 is 4 to 5 days. Most symptomatic humans enjoy the signs and symptoms within seven days of being infected, and almost everyone experiences at least one symptom within 12 days.

Transmission: The virus is transmitted through the airways, but humans release inflammatory droplets and debris when they breathe, communicate, sneeze, cough, or sing. The closer people connect, and the longer they interact with each other, the more likely they are to transmit. However, infection can occur over long distances. Infection peaks when humans begin their signs and symptoms and become infected within a few days. After a week their infection subsides; However, they are contagious for 1 to 20 days and the virus can spread even if they have no signs or symptoms.

Age Group Affected: There are no differences in age and gender distribution of cases both in first and second wave. Women accounted for at least 27% of deaths during the first wave. Similarly, those between 21-60 accounted for 38.7% of deaths. The percentage of those aged 60 and above accounted for 61% amid first wave.

Death Rate: During July-September 2020, there were approximately 7900 deaths. The mortality rate during the first wave from July-September was at its peak, around 1.625. However, decline in the fatality rate was seen among all age groups and gender, it was more pronounced among the elderly.

Some more figures came into vision which showed that 0.27% COVID deaths were reported in those below 10 years during first wave. In 10-20 years, age group, 0.53% deaths were reported. In 20-30 years, age group 2.08% deaths were reported. At least 5.27% deaths were reported in 30-40 years of age group people. 11.98% deaths in 40-50 years of age group. While 28.76% deaths were reported in 60-70 years of age group. In 70-80 years, 19.99% were reported as death cases. Over 80 years, 7.82% deaths were reported.

Prevention: It measures to lessen the possibilities of contamination encompass getting the vaccine dose, staying at home, face cover-ups when in public, avoiding public gatherings, maintain social distancing, keeping indoor areas ventilated, dealing with capability exposure periods, washing palms with water and soap frequently for 20 seconds, practicing respiratory hygiene and avoid touching eyes, nose or mouth with hands (Lerner *et al.*, 2020).

Outbreak of Covid-19 During Second Wave

The second wave affected most of the area. The situation in India was very miserable, in which the daily faith of burnt men is also twice as basic. The development of the epidemic there is very critical due to local inequalities. The deadly SARS-CoV-2 virus is deteriorating public lifestyles internationally. Although the lock-down regulations have been relaxed in many places, the social lifestyle is far from normal. Oxford-Astra Zeneca (Covishield/ Waxjeveria), Pfizer-Biotech (Commerneti), Modernna, Johnson and Johnson Johnson, Bharat

Biotech (Kovacsin), Gamlea Research Institute of Epidemiology and more than Mycology In many countries, preference is given to those with approved and vulnerable populations and co-morbidities (Ranjan *et al.*, 2021).

Second Wave Hitting India

The second wave of the COVID-19 epidemic was far more devastating than the first. A large group of asymptomatic population and therefore additional infectious versions of the virus came to light in the middle of the second wave, much faster than the primary wave, which peaked in September, and they also transmitted internal viruses. In the second wave, the containment area marking is much less rigorous. Micro Containment Zones do not have strong surveillance and the numbers cases increase as the lockdown begins. An external call was made to supply oxygen. People are losing their lives due to lack of oxygen and beds in hospitals. The Indian Medical Management Protocol describes oxygen therapy as a primary treatment. The goal is to achieve 92-96% SpO_2 or 88-92% in patients with COPD. This is different from this category where oxygen beds are required. As a percentage of these that require oxygen, the beds are still growing. The two vaccines authorized for emergency use in India did no longer prevent transmission of the virus, they handiest reduced extreme sickness or hospitalization. Data launched through the government confirmed that post-vaccination, around 2-four individuals in line with 10,000 have examined tremendous. This time there has been an exchange in signs.

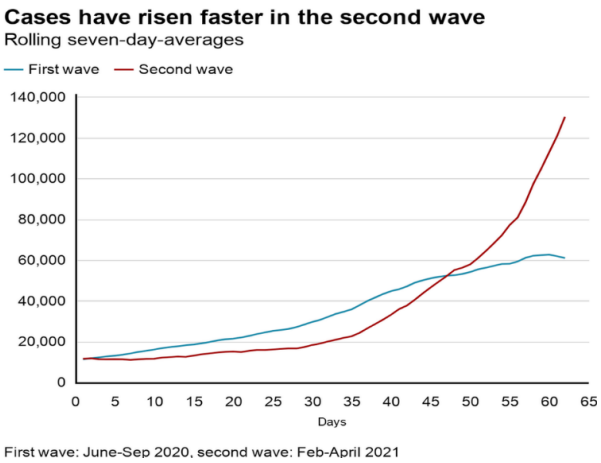

Figure 2. Number of cases in both waves (Covid-19 in India: Why second coronavirus wave is devastating By Vikas Pandey and Shadab Nazmi)

Symptoms: Most common symptoms

In addition to the features seen in the first wave, there were serious features that played differently and added difficulty in patient. The symptoms were conjunctivitis, skin rash or discoloration of hands or feet, shortness of breath or shortness of breath, Chest pain or pressure, Lack of speech or movement. One of the early symptoms of coronavirus was shortness of breath or dyspnea (dyspnea) which mainly appears in patients with stage II infection at some stage. Although the severity of shortness of breath varied in people, this symptom caused most sufferers to feel tightness in the chest with the result that the air is stable. Pollution reduces oxygen saturation (SpO2 stages) which additionally damaged the lungs and in some cases even lead to multiple organ failure.

Age Group Effected

According to the latest data from the latest Covid-19 cases by various states, the number of people under the age of 40 in the second wave is more likely to be infected in the second wave than the elderly in the first wave. The virus has major targets. The first two forms of the virus (Wuhan and D614G) infected the proportion of Indians. Older people with a lower immune system are more susceptible to infection in the first generation, and the rest (including the younger generation) escape.

The second wave is caused by many new variants and the virus burden is higher in infected people. When these infected people have a high virus load, those who are not infected and have no immunity are at higher risk of infection. Therefore, the proportion of young generation who are not affected but are more likely to be infected than those who are immune compromised are more likely to be infected (Table 1). The Dashboard for Distribution of Age-Covid-19 Patients in India by the National Center for Disease Control (NCDC) 21.76% of the total confirmed cases in the country are in the 31–40-year-old age range and 21.70 in the 21–30-year bracket. In contrast, only 8.74% of the confirmed cases were from the 61–70-year bracket, while those aged 71-80 were 3.56%.

Effect on Mental Health

Records show that every single communicable infection pandemic brings about a chief impediment within the intellectual wellbeing. This ends up in the

growth in suicide rates. The grief and depression due to lack of a dear one, tension and panic due to unsure destiny and monetary instability leads people to adopt those drastic actions. Strict lockdown legal guidelines, social distancing, regulations in movement led to extended display time. Consistent misinformation on social media resulted in an extremely panic and melancholic situation all over the nation. The unexpected and profound changes in everyday recurring were extremely confusing and difficult to cope with children, elderly and quarantined people. Shutting of universities and schools, leisure out of doors sports, not meeting friends took a toll on the intellectual well being of the kids. Over 50% of those over 60 years have as a minimum one comorbidity by placing them at a higher risk (Roy *et al.,* 2020). The emotional influences of these populations can encompass worry and stressed out.

Death Rate

In the first ten days of May, the number of reported deaths in India reached nearly 40,000, which is one-third of the worldwide death toll. In April, India reported the highest number of deaths after Europe and Brazil. Even without under-reporting, India's second wave is devastating, killing many people every day. There is no relevant or accurate data yet to confirm the percentage of deaths in the second wave, but this wave has largely affected the 30-50 age group.

Medicines Administered During Second Wave

A green approach to drug discovery is to check an existing antiviral capsules be effective in treating associated infections caused by viruses. Numerous drugs, which include ribavirin, interferon, lopinavir-ritonavir, corticosteroids, chloroquine and two well-known broad-spectrum antiviral drugs, remdesivir (GS-5734) and favipiravir (T-705) towards 2019-nCOV *in vitro.*

Age Group	IST Wave	2ND Wave
<10	0.27%	0.34%
10-20	0.53%	0.31%
20-30	2.08%	1.72%
30-40	5.27%	5.39%
40-50	11.98%	10.82%
50-60	23.29%	21.23%
60-70	28.76%	28.21%
70-80	19.99%	22.17%
80+	**7.82%**	**9.81%**

Table 1. Motility rates (Ranjan *et al.,* 2021. Characterization of the Second Wave of COVID-19 in India. *med Rxiv*.)

Post Covid Syndrome

At the same time as the sector continues to deal with an impressive quantity of coronavirus instances, some extra issues that are currently being determined amongst the continued disaster. Numerous sufferers to have put up fatigue, including different signs and symptoms after getting regained. Approximately 72% of survivors had primary complaints of exhaustion, a small percent had serious signs and symptoms inclusive of pulmonary fibrosis, renal impairment, cardiomyopathy, and cardiac arrest.

It is highly imperative for us to be extra cautious about the extent of multi-organ impact that the virus has after it leaves the body. Some publish covid signs are:

- Few humans' criticism of persistent fatigue, shortness of breath, hindering their capabilities to complete even little ordinary responsibilities.
- This virus impacts the heart and the cardiovascular system which can be life menacing, specifically in people with pre-current coronary heart sicknesses. Patients after combating covid, had persistent fatigue, abnormal coronary heart rate and chest pain contributing to an upward push in cardiomyopathy.

The other vital observations in sufferers with infection is the development of blood clots, huge clots leading to strokes and tinier ones journeying to give up organs like the liver, kidney causing large organ damage.

- Every other rising hassle is the low kidney function in sufferers who got discharged after covid. Patients had infrequent urination and from time to time the damage has been vast enough to require dialysis. The harm is currently being located within the more youthful sick people or those with no records of kidney sickness, is essentially ascribed through the infection, lower oxygen tiers in blood, cytokine hurricane and the clots that could block kidney function.
- Liver harm is the outcome of virus replication and harm to the liver tissues in the course of the disease. Sufferers had been stated to have extended ranges of liver enzymes main to its ex-

traordinary functioning. It additionally attributed to pneumonia-associated low oxygen stages, cytokine storm and facet-outcomes of medicine used to cure the contamination.

- Some patients have evolved seizures, and moderate to intense infection through the brain. A few people who recovered with mild symptoms mentioned feeling confused, dizziness, blurred imaginative and prescient etc. It can also boom the hazard of developing Parkinson's and Alzheimer's ailment.
- Coronavirus can probably interfere with nutrient uptake by means of digestive machine, which makes it increasingly difficult for the body to soak up vital vitamins and electrolytes. Several patients whinge of nausea, belly soreness, loss of appetite, chronic diarrhoea. For this reason, it turns into important to now not underestimate post covid syndrome.

Conclusion

The coronavirus disease maintains to spread the world over, following a trajectory that is difficult to anticipate. The fitness, humanitarian and socio-monetary guidelines followed with the aid of countries will determine therate and energy of the restoration. A global attempt is required to support international locations that currently do no longer have enough financial area to finance social policy, regular social safety systems.

It is time to give up conventional wondering-based totally stereotypes and sooner or later start performing from an ethical attitude. After all, our nice wager is a glad destiny for all who live in the world, our common home. The reason why second wave was more dangerous because people took it very lightly after the first wave there was the reopening of everything- school, cinemas, colleges, market places, airports, and other crowded places as well. People did not follow the rules to protect themselves. After lockdown during the first wave everyone was eagerly waiting to go out which caused crowd at so many places. The second wave this time hit the youngsters more as they step out from the houses and didn't followed the norms. Studies suggested the youngsters had no immunity against corona virus and the first wave hit the economy of India so badly that people have too come out for their livelihood. There was no proper funding for the medical healthcare and infrastructure which lead to this devastating pandemic. With 8.5 hospital beds per 10,000 population and 8 physicians per 10,000, the country's healthcare sector was not equipped for such a crisis. Moreover, the significant inefficiency, dysfunctioning and acute shortage of the healthcare delivery systems in public sector did not match up with the growing needs of the population. There was shortage of beds, oxygen cylinder, medicine, doctors people were not able to get any treatment and died.

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