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Epidemiology of epidemics in India

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ABSTRACT

In the recent wake of the novel coronavirus outbreak, countries around the world have suffered greatly in terms of economy, health, and loss of lives. To date (5 July 2021), there have been more than 184,562,051 cases, with 3,993,319 deaths and around 168,907,181 recoveries. Not a single country has been spared; India included with 30.5 million cases, 402,000 deaths and 29.7 million recoveries. India is a vast country that has undergone and survived the onslaught of many viruses and epidemics. From the Black Death, Blue Death, Severe Acute Respiratory Syndrome (SARS), dengue and chikungunya fever, meningococcal disease, Japanese encephalitis (JE), avian influenza, Nipah virus and now, COVID-19, India has seen and experienced it all. The country saw the first spike of COVID-19 cases at the beginning of March 2020 with 50 cases recorded daily and by the end of March, the lockdown which was imposed by the Prime Minister, Narendra Modi had been extended five times as the country awaits the number of cases to reach its peak, and then hopefully, a plateau. This paper looks at the string of major pandemics and viruses that have hit this country, the global alerts and responses, the impacts and number of lives lost to all these catastrophes and the rise of pandemic-related misinformation.

Keywords: ***Epidemiology, epidemics, India, COVID-19, pandemics***

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INTRODUCTION

Most recently, a novel coronavirus has been identified as the etiologic agent of COVID-19 although this agent has not been recovered in a significant fraction of previous coronavirus cases. In early March 2020, many countries started seeing a spike in COVID-19 cases. On 11 March 2020, the global alert from the World Health Organization (WHO) announced COVID-19 as a pandemic, causing rising concerns all around the world. Many countries shut their international borders after the announcement was made and a number of countries started experiencing a spike in the number of confirmed cases. India was one of them.

India is a country that has seen the wake of many viruses and epidemics. From the Black Death, Blue Death, Severe Acute Respiratory Syndrome (SARS), dengue and chikungunya fever, meningococcal disease, Japanese encephalitis (JE), avian influenza, Nipah virus and now, COVID-19. The first COVID-19 case in India was reported officially on 30 January 2020 in the state of Kerala but the number of cases until February 2020 had been quite low. The country saw the first spike on 10 March 2020, raising the count to 50 cases recorded in a single day and by the 25th, Prime Minister Narendra Modi was compelled to announce a nationwide lockdown ("PM Modi announces", 2020). The lockdown has been extended five times as the country waits for the number of cases to reach its peak.

This paper looks at the string of major pandemics and viruses that has hit this country and looks at the global alerts and responses, the impacts and number of lives lost to all these catastrophes. But first, it would be best to look at the definitions of some related terms:

- An epidemic is a disease that affects a large number of people within a community, population or region.
- A pandemic is an epidemic that is spread over multiple countries or continents.
- An endemic is something that belongs to a particular people or country.
- An outbreak is a greater-than-anticipated increase in the number of endemic cases. It can also be a single case in a new area. If it is not quickly controlled, an outbreak can become an epidemic (Intermountain Healthcare, 2020).

So, a simple way to differentiate an epidemic and a pandemic is to remember that the "P" in pandemic implies it has a "passport" to travel.

CHRONOLOGY OF EPIDEMICS

a. The Black Death, also known as the Great Pestilence, has been recorded as the most fatal pandemic in human history. The Black Death originated in Central Asia or East Asia from where it travelled along the Silk Road, reaching Crimea by 1347. From there, it was most likely carried by fleas living on the black rats that travelled on Genoese merchant ships, spreading throughout the Mediterranean Basin, and reaching Africa, Western Asia, and the rest of Europe via Constantinople, Sicily, and the Italian Peninsula. Once it came onshore, current evidence shows that it was largely spread by human fleas which caused a pneumonic plague and person-to-person contact via aerosols which the pneumonic plague enabled. As such, it caused the epidemic to spread inland very fast, much faster than expected if the primary vector had just been rat fleas (History, 2020).

Patients inflicted with Black Death exhibited strange swellings in several body parts such as the groin or under the armpit. Followed by unpleasant symptoms such as fever, chills, vomiting, diarrhoea, terrible aches, and pains (DeWitte & Hughes-Morey, 2012). In Europe, the pandemic was known as the bubonic plague. It arrived in October 1347, when 12 ships from the Black Sea docked at the Sicilian port of Messina. Most of the sailors aboard were dead, and those barely alive were ill and covered in black boils that oozed blood and pus. Sicilian authorities hastily ordered the fleet of "death ships" out of the harbour, but it was too late. Over the next five years, the Black Death resulted in 200 million deaths, sweeping away a quarter of the global population. It is estimated that it killed 30% to 50% of the European population (History, 2020).

b. The Blue Death

India was unfortunate enough to be stricken with Blue Death after Black Death. The influenza pandemic in 1918, also known as cholera, derived its name from the Latinate Italian phrase *influenza coeli*, meaning "influence of the heavens". Cholera is one of the deadliest diseases to afflict our planet and is consistently ranked among the top diseases that have killed the greatest number of people in history and is still prevalent today. The main symptoms of cholera are diarrhoea and vomiting which causes substantial fluid loss. Additional symptoms include abdominal pain, dehydration, dry mucosa (dryness in the oral cavity), oliguria (less urine output), nausea and muscle cramps. The combined effect of all these symptoms causes the body to loose so much water, that the outward appearance of the body changes significantly. The eyes sink in, the skin starts to lose its elasticity, and the teeth protrude out. The blood becomes thick, and the skins turns blue due to high dehydration. Hence the name Blue Death.

The disease first arrived in Bombay (now Mumbai), courtesy of a container ship in May. Deaths started to peak in the first week of October, the same time as Boston, where it had already started to spread. By the end of the year, the flu had killed an estimated one million people in this populous Indian city. All told, the pandemic claimed the lives of 18.5 million people across the Indian subcontinent, and according to estimates, perhaps as many as 100 million worldwide (Honigsbaum, 2020).

c. Severe Acute Respiratory Syndrome (SARS)

Also known as the "Super Spreader", this virus was first discovered in early 2003. This virus was thought to be an animal virus from an as-yet-uncertain animal reservoir, perhaps bats, that spread to other animals. The first infected human case was reported to be found in the Guangzhou province of Southern China. In the early 2000s, chefs in Guangzhou began to offer a more exotic fare on restaurant menus, including game animals that had been considered rare seasonal delicacies sourced out from countries like Laos and Vietnam, or game animals bred on small unregulated farms, from where they were transferred to animal markets in Guangzhou and Shenzen (Honigsbaum, 2020). The result was a mix of multiple species in animal markets that would become a potential reservoir of a viral Armageddon.

Since then, the number of cases started to increase and probable cases of SARS were reported in another 17 countries. The transmission of this virus is primarily person to person, which can be spread when people cough or sneeze, spraying tiny droplets of liquid with the virus to other people within 2 to 3 feet. Transmission can also occur when one touches surfaces or objects contaminated by these droplets, then touching the eyes, nose, or mouth (Robinson, 2020). The early symptoms of SARS are similar to flu which include high fever, chills, and muscle aches. There is also a slight chance of diarrhoea occurring. These symptoms can worsen quickly and cause a dry cough which

results in the need of a ventilator to help with breathing. Health professionals worked together successfully to contain the global outbreak in July 2003. Since 2004, there have not been any known cases of SARS reported anywhere in the world, making it a great success in curbing the global outbreak. A total of 8437 cases and 813 deaths gives SARS a case fatality rate of 11% (World Health Organization, 2003). India reported only "probable cases" of SARS, one each from West Bengal, Karnataka and Gujarat and 10 "suspect cases" of SARS: 3 from Karnataka, 2 from Maharashtra and one each from Delhi, Goa, Tamil Nadu, Chhattisgarh, and Rajasthan. Only one "probable case" had pneumonia. The other two "probable cases", which initially fulfilled the clinical and epidemiological criteria of only "suspect cases", also tested positive for SARS on the polymerase chain reaction (PCR) test. Thus, they were also considered as "probable cases" as per the revised WHO case definition (Agarwal, 2003).

d. Dengue and chikungunya fever

Dengue, a mosquito-borne tropical disease can be found in any part of a tropical country. Dengue viruses are spread to people through the bite of an infected Aedes (*A. aegypti* or *A. albopictus*) mosquito. Dengue is common in more than 100 countries around the world. About 40% of the world's population or 3 billion people live in areas at risk of dengue. Dengue is often a leading cause of illness in these high-risk areas. In India, this disease has killed more than 200 people in Tamil Nadu. The National Vector Borne Disease Control Programme (NVBDCP) stated that dengue claimed the lives of 226 people in the country according to the latest figures of 10 December 2020 (Press Trust of India, 2017). In Kerala, the disease affected 19,776 people and claimed the lives of 37. In 2016, 129, 166 cases were reported resulting in 245 fatalities (Press Trust of India, 2017).

Similarly, chikungunya is also a viral infection spread by the Aedes mosquito. The difference is chikungunya is caused by a Togaviridae alphavirus, while dengue is caused by a Flavirideae flavivirus. But it is claimed that the pain caused by chikungunya is more severe than that of dengue. Chikungunya affected 60,232 people across the country with 30,606 cases in Karnataka alone, while in 2016, it affected 64,057 people in several other states ("Dengue claims 226 lives", 2017).

e. Meningococcal disease

This is an acute bacterial disease caused by meningococcus (*Neisseria meningitidis*), a gram-negative capsulated coffee bean shaped bacterium seen usually in pairs. The disease was first described in 1805, during an outbreak in Geneva, Switzerland and the causative organism was identified in 1887 (WHO, 2005). The disease is manifested by the sudden onset of fever, severe headache, nausea and vomiting, stiff neck and frequently, a petechial rash with pink macules and very rarely, vesicles accompanied by delirium and coma (CD Alert, 2009). According to WHO (2005), since 29 March 2005, 111 cases of meningococcal disease and 15 deaths have been reported in Delhi. In reviewing past outbreaks of this disease, WHO (2005) concluded that meningococcal disease is endemic in Delhi on account of sporadic cases of meningococcal meningitis that occurred here in previous years. In addition, outbreaks of meningococcal disease in and around Delhi have also been documented in 1966 and 1985.

f. Japanese encephalitis (JE)

Japanese encephalitis, more commonly known as JE, is a common mosquito-borne flavivirus encephalitis. It is one of the leading forms of viral encephalitis worldwide, mostly prevalent in eastern and southern Asia, covering a region with a population of over three billion. Most infections of JE are asymptomatic, but if clinical illness develops, it causes significant morbidity and mortality (Tiwari, Singh, Tiwari, &

Dhole, 2012). It appears that JE may become one of the major public health problems in India, considering the substantial vulnerable paediatric population, the proportion of JE infections among encephalitic children and widely scattered JE-prone areas (Kabilan et al., 2004). The first case was reported in 1955, where the disease was restricted to South India. The disease then spread to north India in 1978, from where extensive and recurrent outbreaks of JE have been reported ever since (Kumari & Joshi, 2012).

g. Avian influenza

Bird flu or avian influenza is the name used to describe a viral infection that is reported mostly in birds but has the potential to afflict humans and other animals. The most common strain of the virus that causes severe respiratory disease in birds is H5N1; various other strains like H7, H8 also cause infections (Biswas & Mascarenhas, 2021). The virus was first reported in China in 1996 in its geese farms. Since then, outbreaks have been reported periodically across the world. India reported the presence of the virus in Nandurbar, Maharashtra, in 2006, which led to a large-scale culling of poultry birds. Samples from Rajasthan, Madhya Pradesh, and Kerala tested positive for the A (H5N8) strain of the virus, while samples from Himachal Pradesh showed the presence of A (H5N1) (Biswas & Mascarenhas, 2021). Anxiety started to spread after its presence was confirmed in communities in Kerala, Rajasthan, Madhya Pradesh, Haryana and Himachal Pradesh. Consequently, people around the communities that have been affected by the disease started avoiding eating chicken and eggs which then led to the fall in poultry prices and caused financial loss to the industry.

h. Nipah virus

Nipah virus (NiV) is a zoonotic virus, which is transmitted from animals to humans (CDC, 2020) and can also be transmitted through contaminated food or directly between people. In infected people, it causes a range of illnesses from asymptomatic infection to acute respiratory illness and fatal encephalitis. The virus can also cause severe diseases in farm animals such as pigs, resulting in significant economic losses for farmers (World Health Organization, 2003). It was first detected in Malaysia in 1999 during an outbreak involving pig farms. While in India, the outbreak was reported in Kozhikode, a district of Kerala, India (WHO, 2018). There were 18 confirmed cases and 17 deaths as of 1 June 2018. The two affected districts were Kozhikode and Mallapuram.

i. COVID-19

On 30 January 2020, the first case of COVID-19 in India was reported by various news agencies. A student from Kerala who had enrolled at the Wuhan University was tested positive, and was immediately put into isolation to be monitored. Coincidentally, more than 10 citizens across Maharashtra were placed in isolation wards over the suspicion of being infected by the same deadly virus. "Even before the first confirmed case, we were doing our best to ensure diagnosis and then to treat if any positive cases of Coronavirus were to arise," stated Harsh Vardhan, India's Health Minister on 30 January 2020 ("With first confirmed case", 2020). Initially, the cases did not necessitate quarantine measures but when the infectious virus started spreading all over the country, the Indian government was left with no choice but to implement a lockdown (which has since moved into five phases) to contain the pandemic.

The first lockdown, Lockdown 1 (25 March – 14 April 2020) saw the closure of public venues and ban on social gatherings. On 14 March, public places except for malls and restaurants were required to shut down in Karnataka and Maharashtra. The first 21-day lockdown in India was officially announced by Prime Minister Narendra Modi on 24

March ("PM Modi announces", 2020), with quarantine guidelines communicated through the news for citizens. All commercial and private establishments were closed except for essential shops, banks, insurance offices, media stations, essential networking services, petrol stations, security services and power distribution units. Transportation — air, rail, and roadway services were also suspended. Limited headcount for events and regulations for individuals who arrived in India after 15 February were also put in place, with strict penalties for any violations. To keep track, daily "ground reports" on the numbers of infections and deaths in various states also commenced.

Lockdown 2 (15 April – 3 May 2020) was implemented with a conditional relaxation for regions where the outbreak had been contained after 20 April. On 16 April, lockdown areas were classified as "red zone", suggesting hotspots of infection, "orange zone" suggesting some infection, and "green zone" with no infections. The government allowed the opening of agricultural enterprises, including dairy, aquaculture, and plantations, as well as shops selling agricultural supplies. Public works projects were permitted to resume with rules to maintain social distancing. Cargo transportation vehicles such as trucks, trains and planes were also permitted to run. Banks and government centres that were distributing financial support to citizens could open as well. Small retail shops were allowed to operate with only half of the staff and strict adherence to social distancing. On 29 April, guidelines for interstate movement for those stranded were issued by the Ministry of Home Affairs (Bahadur Sing & Sandhu, 2020). States were also instructed to appoint nodal authorities and form protocols to receive, monitor and quarantine those stranded as well as conduct periodic health check-ups.

For Lockdown 3 (4 – 18 May 2020), the country was divided into three zones: red zone (130 districts), orange zone (284 districts) and green zone (319 districts). Red zones were areas with a high number of cases and a high doubling rate, orange zones have had comparatively fewer cases and green zones have had no cases in the past 21 days. Normal movement was allowed in green areas with public transport capacities limited to 50%. In orange zones, only private and hired vehicles were allowed but no public transport. The red zones would remain in lockdown. As such, the classification of the regions were revised every week.

The National Disaster Management Authority (NDMA) and the Ministry of Home Affairs (MHA) imposed Lockdown 4 (19–31 May 2020), with additional relaxation ("Lockdown 4.0", 2020). States were granted a greater say in the demarcation of the green, orange and red zones and the roadmap for implementation. Red zones were further broken down into containment and buffer zones.

Lockdown 5 (1–30 June 2020) or Unlock 1.0, was the fifth phase of easing in India's lockdown. A three-phase unlock guideline was issued by MHA: Phase 1 — opening of public places such as religious worship houses, hospitality services and shopping malls, Phase 2 —opening of educational institutions and Phase 3 — permitting air travel, social activities, and large religious functions and gatherings. These three phases of unlocking were dependent on the situation and in accordance with Standard Operating Procedures (SOPs). Night curfew from 9:00 p.m. – 5:00 a.m. was retained. States continued to identify buffer zones outside the containment zones, where new cases were likely to occur and lastly, senior citizens, people with comorbidities, pregnant women, and children under the age of 10 years were advised to stay at home.

MISINFORMATION OF COVID-19 IN INDIA

For more than a year, the term "fake news and misinformation" in relation to COVID-19 was prevalent not only in India, but throughout the world. False narratives on COVID-19

spread amongst netizens around the world through Facebook and WhatsApp could not be curbed as technology had given the freedom to anyone to share their point of view and their own interpretation of the epidemic (Friedrich, 2020).

To analyse the misinformation landscape over the past year, Health Analytics Asia collated data from International Fact-Checking Organisation's (IFCN) 'The CoronaVirusFacts' database — a repository of fact-checked stories by organisations who are IFCN signatories (Khan, 2021). To begin with, a sample of 1927 fact-checked stories from India revealed the maximum fact-checks were related to lockdowns and cures. Of this, fact-checkers found 310 pieces of misinformation on lockdowns and 135 pieces of misinformation on cures regarded as false or misleading between January to December 2020. India reported its first case of COVID-19 in the last week of January 2020. According to the analysis, the first fact-check on COVID-19 was published on 25 January 2020 and found that misinformation on COVID-19 lockdowns increased between the month of March and July 2020, while misinformation on cures started spreading from February onwards and has continued to remain so.

Badrinathan (2021) stated that COVID-19 misinformation in India appears to fall primarily into two categories: fake miracle cures, and conspiracy theories about the origin and spread of the virus. Fake cures include beliefs that home remedies such as garlic, steam inhalation or Ayurveda — an alternative medicine system with roots in traditional Indian philosophy — can cure COVID-19. Beliefs in miracle cures are dangerous if even a fraction of those convinced ignore best practices such as social distancing. Meanwhile, conspiracy theories, including narratives that scapegoat minorities, can increase animosity between social groups, paving the way for further polarisation and violence.

Thanks to the advancements of technology and the ubiquitous internet, fake news has become inextricably linked to the digital world, affording anyone accessibility and freedom to disseminate opinion and information. This freedom has enabled an uncurtailed freedom of expression and the ability to share anything with anyone in this network.

To correct the misinformation in India, evidence has shown that WhatsApp users correcting their peers for posting falsehood is effective at combating misinformation on the pandemic and calls for more creative solutions. One idea is to use unusual sources to fact-check fake stories. Research in the United States has shown that unexpected sources are more effective at correcting misinformation, such as when Democrats contradict Democrats rather than when Republicans contradict Democrats (Badrinathan, 2021). Badrinathan further argued that by applying this logic to India's context, religious leaders debunking religiously motivated medical misinformation might be an effective solution.

ECONOMIC AND SOCIAL IMPACTS

The Black Death swept through many parts of the globe and killed millions of people which deeply affected the global economy. With fewer people to feed, grain prices dropped, and rural areas essentially collapsed as farms lost their source of income. Many fled to the cities causing thousands of farms and villages to be deserted (Langer, 1964). Such a situation was a common sight throughout countries devastated by Black Death (Yoder, 2006).

The Black Death also led to many social issues. During the pandemic, as law enforcement became scarce, many took advantage of the situation and crime thrived. The pandemic drove many to discard morals and others become raving fanatics of God. Churches would be crowded with devotees, and people showered them with gifts. Many others gave up on hope and would drown themselves in alcohol and ribaldry (Langer, 1964).

SARS, on the other hand, swept through many parts of the world in 2003 and claimed 7452 lives globally (World Health Organization, 2003). Virus-ridden cities literally turned into ghost cities with no one on the streets save for a few cars (Qiu, Chu, Mao, & Wu, 2018). Even though the number of deaths were less, the economic impact was still sizable. It was estimated that Asian countries lost USD 12–18 billion due to SARS. Globally, the macro-economic impact of SARS was estimated to be at USD 30–100 billion while in China, it caused an estimated drop of 1% in GDP and loss of USD 12.3–28.4 billion (Qiu et. al. 2018).

In terms of social impact, it was not as bad as the economic impact. The public, worried due to the lack of trustworthy official information, started buying into folktales and believing them. This caused widespread panic buying in many cities in China. Many flights were cancelled, schools were closed and mass gathering events were called off to stop the virus from spreading (Qiu et al., 2018).

Many preventive measures were rolled out to prevent the spread of SARS. For instance, early reporting of suspected cases, contact tracing and surveillance of cases. In areas with community transmission, additional measures such as isolation of suspected cases, quarantine measures and teaching the public to report symptoms were also carried out. Besides that, travel restrictions were placed on SARS-hit countries and exit screening done on travellers from red zone areas. Additionally, studies were done on different clusters to better understand the incubation period and transmission of SARS. In case of future outbreaks, detailed clinical features and prognostic were done, characterised and analysed to ease identification of cases. Also, the number of confirmed cases was made known to the public via WHO's website (Hawkey, Bhagani, & Gillespie, 2003).

During any pandemic, authorities commonly adopt one major preventive measure. Generally, any city hit by a plague is isolated and troops would be sent in to ensure no one could enter or leave. Entire roads would be closed to restrict movement and the sick would be quarantined at home. During the Black Death pandemic, gallows were installed in public squares as a warning against those found violating regulations.

When the coronavirus swept through Wuhan in China, people around the world never expected it to become a global health pandemic. To date (5 July 2021), there have been more than 184,562,051 cases, with 3,993,319 deaths and around 168,907,181 recoveries. Given how contagious and deadly the virus is, many governments imposed strict social distancing rules and directed companies to adopt remote working, including India. The virus, however, has caused the global economy to plunge into its worst recession since World War 2 (The World Bank, 2020). The World Bank, on 8 June 2020, stated that the global economy would shrink by 5.2% for the year, whereas the Gross Domestic Product (GDP) is expected to drop by 6.2% (2020). The International Monetary Fund (IMF) had drastically revised India's growth rate projection for the current year, from 5.8% to 1.9% (World Economic Outlook Reports, 2020). For India, this will be her first true recession since 1979; the country has had only experienced growth recession but never negative growth (Jagannathan, 2020).

The recession caused a plunge in the stock market and impacted negatively almost all economic sectors. India's lockdown halted as much as 70% of the economic activity nationwide (The World Bank, 2020) and saw massive job losses which might worsen the unemployment crisis (Jagannathan, 2020). In the aviation and hospitality industries, travel bans and lockdowns in different parts of the world caused many airlines and hotels to take a big hit. Hotels received almost zero reservation and most only had an occupancy of 5–10% causing some to shut down operations. Hotels in India are expected to experience 30–55% losses (World Economic Outlook Reports, 2020). For the manufacturing sector,

output had shrunk by 20.6% in March whereas electricity generation contracted by 6.8% (The World Bank, 2020).). Two weeks after India's lockdown, there has been a 77% drop in people visiting retail stores and recreation places and a 65% drop for grocery shops and pharmacies. The fuel industry saw a massive consumption plunge of 45.8% due to the lockdown ("Lockdown impact", 2020). However, sales are expected to pick up with the gradual opening of the country.

Despite the current gloomy economic outlook, some other sectors like healthcare, cloud computing and entertainment have emerged stronger. Tech giant Facebook recorded surges while Netflix reported twice as many new subscribers than expected and the cloud computing industry has burgeoned ("The impact of COVID-19", 2020). As remote working increased, video conferencing platforms like Zoom and Microsoft Teams saw a record-breaking growth in usage ("The impact of COVID-19", 2020). Google Meet usage also surged 30 times over its usual figures in January 2020 (Chowdhary, 2020). In the entertainment industry, video streaming sites and video games saw an upswing in usage. These surges have caused India's regulator to petition for a popular streaming platform to temporarily reduce the quality of streams ("The impact of COVID-19", 2020).

As the economy gradually exits the country's lockdown, multinational companies and large corporates are looking to hire people (Minter, 2020). However, the informal economy is having difficulties rehiring workers. The informal economy forms the bulk of employment and accounts for 40% of the country's GDP (Minter, 2020). Most of the people in this sector had migrated from the rural parts of the country to the cities to settle down. During the lockdown, many lost their jobs and went back to their villages and are now, reluctant to return (Minter, 2020). This has hindered the reopening of many businesses.

THE DELTA PLUS VARIANT

While the people of India thought they were over the worst, little did they know that their nightmare was just beginning. The latest numbers on 2 July 2021, revealed 100,000 deaths in 39 days, a Reuters tally showed, as a brutal second wave of infections swept across cities and into the vast countryside where millions remain vulnerable without a single shot of vaccine ("COVID-19 death toll", 2021).

India's death toll is the third highest globally with 30.5 million cases behind the United States, which has thus far recorded 33 million cases ("India COVID death toll", 2021). Overnight, the country recorded 853 deaths, taking the death toll past the 400,000 mark, according to data from the Health Ministry. Experts say the actual number of dead could have reached 1 million or even higher, with a possible third wave of infections looming.

The country saw scores of bodies being washed up along the Ganges River in northern India in May, as people struggled to keep pace with deaths at the peak of the second wave. India's open crematoriums are overflowing with victims of COVID-19 as relatives and volunteers say their prayers beside the burning pyres ("India COVID death toll", 2021).

Currently, the government has shifted its focus to mass immunisation amid warnings from disease experts of a looming third wave as the country slowly reopens and a new variant, locally called the Delta Plus, emerges.

Due to the COVID-19 pandemic, the Indian government has imposed many measures to contain the virus. For instance, the ban on hunting wild animals and social gatherings, closure of education facilities, cancelation of exams, curfews, and a nationwide lockdown. All of these have influenced the lives of Indian citizens in many ways. Due to the lockdown imposed, the food supply has also been disrupted (Das, 2020).

During the lockdown, industries deemed as non-essential were directed to allow their employees to work from home. For many however, their production line workers could not possibly work from home. As such, they were forced to close, and the employees were not given any pay seeing as the company did not have the ability to pay them. In some cases, the company would choose to lay off workers and rehire when the lockdown ended as it made more business sense for them.

For instance, GoAir, an Indian low-cost air carrier located in Mumbai, India decided that their senior management would take a 50% pay cut (Chowdhury, 2020). Similarly, IndiGo, another Indian budget airline imposed a 5-25% pay cut on its employees (Chowdhury, 2020). This ultimately led to many people in India undergoing a difficult period due to no or reduced income. It is estimated that 400 million Indian workers may sink into poverty (The World Bank, 2020). To prevent this situation, the Indian government has been giving free food to the poor since the start of the lockdown ("FM Nirmala Sitharaman", 2020). Besides that, the government also announced a relief package worth Rs 1.70 lakh crore, approximately USD 24.5 billion, to help the nation's poor through their financial difficulties ("FM Nirmala Sitharaman", 2020).

CONCLUSION

The COVID-19 virus has been proven to transmit easily; a person can contract the virus merely by touching a surface where a carrier has touched. Adding to this, its long incubation period has caused many struggles for healthcare systems all over the world. Some healthcare workers in India have contracted the virus while treating COVID-19 patients (Aravind, 2020). Apart from the heightened risk of infection, anxiety and being separated from their families, healthcare workers also increasingly deal with social ostracism, harassment and even assault. Serving on the frontlines to contain COVID-19, healthcare workers pay a heavy price for doing their job, often with minimal gear to protect themselves from the coronavirus.

Take for instance Lisha Jose's story. The ordeal for Lisha began on the night of April 4, when a call came from the super specialty hospital in New Delhi where she works as a nurse. She was informed that she had tested positive for COVID-19 and needed to go into quarantine immediately. As she walked the few meters from her home to the ambulance, she realised all her neighbours had come out to watch. Many whipped out their mobile phones to shoot a video of her, while others simply stared. "I felt like a criminal being taken away… What wrong had I done? I only did my duty," she lamented (Aravind, 2020).

Healthcare workers, frontline service staff and officials continuously face discrimination because of their jobs. Due to the widespread perception that they are more likely to contract the virus, neighbours cast them out and some are evicted by their landlords. Prime Minister Modi referred to healthcare workers as "*Ishwar ka roop* (a representation of the divine)" and cautioned that criticism, discouragement and negativity towards this sector workers should be stopped ("Corona Ka Jawab", 2020). He also instructed the home department and DGPs to address the issue and punish those guilty of doing so ("Corona Ka Jawab", 2020).

With the ever-increasing number of patients and limited workforce, many healthcare workers become overworked, and some are on the verge of breaking down. Besides that, due to the large number of patients, hospitals are quickly running out of resources such as drugs and medicines which has led to shortages in many parts of India; nevertheless, the battle against COVID-19 continues (The World Bank, 2020).

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