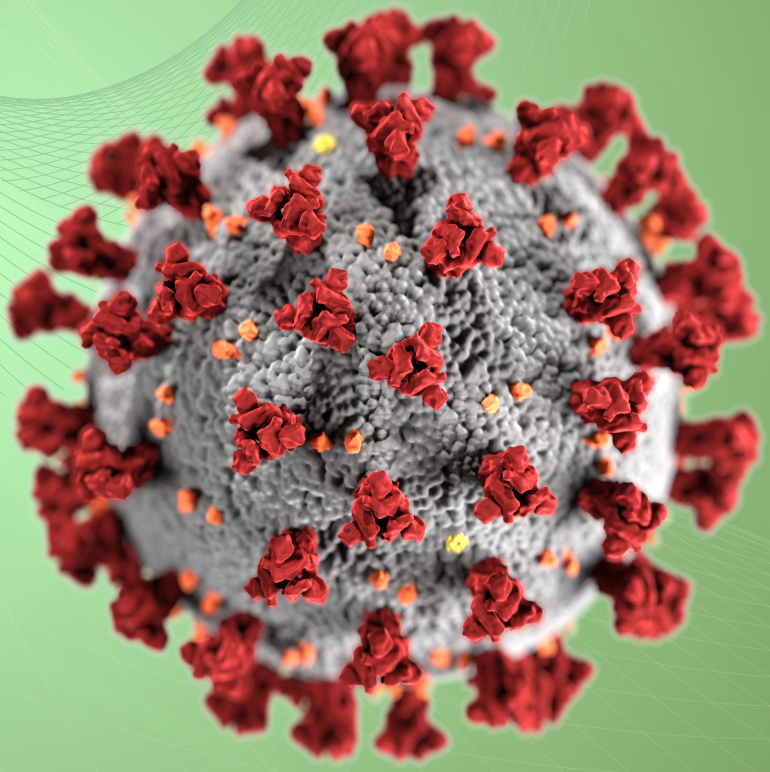
COVID-19 Crisis of India

A Doctor's Perspective

Book 1: Dec'19 - Apr'20



This is the story of a nation's struggle against a microscopic enemy, from the origin of COVID-19 to the great Indian lockdown, upto April 14, 2020

Dr. Agnibho Mondal

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Preface

In the early part of 2020 a global threat swept through the Earth, a pandemic called COVID-19. India was no exception. As a resident doctor in the city of Kolkata I had the privilege to experience the pandemic up close.

I decided to chronicle the events during this pandemic as a contemporary account. I have tried to provide references to my source materials as extensively as I could. Some parts of the accounts are my first hand experiences, some parts are collected from the news papers and the scientific parts are compiled from the research papers and clinical guidelines.

As I intended the book to be read by everyone and not just the medical professionals, I have kept my use of medical jargon at a minimum. And whenever I had to use any technical term I've tried to explain it at the same place.

The whole story is told from my perspective as a resident doctor. The main storyline continues from chapter 1 through 5 and then chapter 10 through 12. The intervening chapters 6 to 9 deal with the parallel events that had been happening simultaneously. Chapter 6 is the most technical chapter as it deals with the scientific aspects of the new developments.

The chapters can be read in any order as per the wish of the reader, however a sequential reading may be more enjoyable. I've attempted to narrate the story as impartially as possible. However any opinion expressed is solely my own and doesn't represent my institute, family or friends.

This is the first book of a series covering the COVID-19 crisis of India. This book covers the period from the beginning of the pandemic to the date of April 14, 2020. The next books of the series will cover the rest of the pandemic.

I would like to thank you, the reader, for taking an interest in this book. I hope you enjoy it, and if you do then that would be my greatest reward for writing this book.

Chapter 1

Foreshadowing

Pandemics have been a regular companion of human civilization for as long as it has existed. Hundreds of pandemics have come and gone and each has reaped a great number of souls from the face of the earth. They have always been the dreaded enemies of our forefathers and they are the same dreaded enemies of us now.

When a disease spreads rapidly among the population in a particular region, it is called an *epidemic*. But when such a disease spreads into multiple countries or even worldwide, it becomes a *pandemic*.

We could measure the impact of a pandemic in terms of how many lives are lost. But it's not always easy to measure. We often have fragmented data and incomplete documentation especially in case of historical accounts. Also nations have been known to suppress the real toll on their citizens even in modern times.

We could also look into the number of people infected in each pandemic, but it's virtually impossible to even estimate the true number. This is because not all the people who are infected show the signs of infection, but they carry the disease to other people. We call them *asymptomatic carriers*. Moreover the disease responsible for the pandemic sometimes show different signs than one would expect from it, often leading to misdiagnosis. This is known to us as *atypical presentation*. All these issues combined with the fact that during a pandemic there is acute shortage of doctors and diagnostic equipments, make it impossible to determine the true number of people infected in a pandemic.

But the actual infection is only a part of the story. Economy is devastated, livelihoods are lost, families are destroyed and communities are shattered. Pandemics change societies permanently and in some cases alter the course of the history.

However as a doctor I cannot give you, the reader, a complete picture of the social impact of a pandemic. You need an expert in social sciences for that. However what I can do is to narrate the story from the viewpoint of a healthcare professional and hopefully throw some insight into the medical aspect of a pandemic.

The invisible enemies In broad terms a pandemic can be caused by two types of *microorganisms*: bacteria or virus.

A bacteria is a living being with a single cell. They are complete with all the machineries needed to sustain life. They also often have defences against our immunity, our body's internal mechanism to prevent infections. Many of our early pandemics were caused by them. Plague, the terrible curse of humanity which has devastated civilizations many times throughout the history, is caused by a bacteria known as *Yersinia pestis*. However we now have a powerful weapon against them, the *antibiotics*. Because of this, bacterial pandemics in recent years are not as common and not as deadly. But the threat still remains. Indiscriminate use of antibiotics has lead to widespread *antibiotic resistance* which is often colloquially called *superbugs*. If we are not careful, a pandemic of superbugs may bring back the nightmares of the past.

A virus, on the other hand, is much smaller and simpler. They only have the genetic material like DNA or RNA and some protein to surround it. They are not exactly living and they are not exactly dead. They float around in the environment like an inert grain of dust, but as soon as they come in contact with a living cell they wake up and begin their cascade of destruction. They enter the cell, hijack the cell's internal mechanism to make more copies of themselves and then they burst the cell releasing a myriad of new copies which then go on to infect other cells.

There is a very special thing about viruses, antibiotics do not work against them. There are some antiviral drugs for some specific viral diseases, but for the majority we have to depend on our immunity to take care of them. We have immune cells who produce specific *antibodies* to kill the virus. Some of these cells persist for a long time in our body ready to fight in case the same virus attacks again. This is the basis of vaccine, we make a harmless version of our target virus and make our immunity fight against it. The resulting immunity protects us in case we are ever attacked by the real virus.

But in a pandemic it doesn't work. You see, developing a vaccine takes time, often months and sometimes years and a pandemic spreads much faster than a vaccine can be developed. By the time the vaccine is available, the course of the pandemic may already be over leaving hundreds or even thousands of people dead. So it's only good for preventing a second coming of the pandemic, not the first one. But that's not all, the immunity boosted by the vaccine is very specific and often only good for a certain configuration of a virus. Now the viruses have a nasty habit of changing their genetic material from time to time, and when they do so the previous vaccine will no longer work and we are back to square one. *Influenza* virus is especially notorious for this and we have to change the vaccine every year in order to prevent Influenza outbreaks.

That's the reason a pandemic may only be slowed down by preventing it from infecting new people. The most common method to do this is separating infected persons from others, called as *quarantine*. But once the virus gets released in the community, we have a very difficult problem at hand. We can lock down entire affected areas. We can also keep all the people away from each other, which is being called *social distancing* in recent times. But even with all these a significant damage will have to be suffered.

Transmission of disease Some diseases are exclusive to humans and some diseases come to humans from other animals, like plague which comes from rats by means of rat flea. Some of these exclusive human diseases require vectors such as mosquitoes to transmit, an example of this would be malaria. But most of our modern pandemics are the result of human to human transmission and almost all of them are caused by respiratory viruses, meaning they can be easily

transmitted by coughing or sneezing. In addition to this some viruses can survive on surfaces for a prolonged period of time increasing the chance of infection.

Hence poor hygiene and bad living conditions have always been associated with the severity of pandemics. Spread of respiratory viruses like Influenza can often be mitigated by good cough etiquette, proper hand washing, cleaning of surfaces such as door handles etc. A person doesn't immediately show symptoms of infection. It may be days before the symptoms of infection may become apparent. This period is called the *incubation period*. If a virus is capable of spreading to other persons during this incubation period, it will be very difficult to contain it.

For a virus to be able to cause a pandemic it has to spread faster than it kills people. If the virus is too lethal the infected person will die before he has a chance to spread it to another. But a higher infectivity also means that it will exhaust the population much faster and the pandemic will be over very soon. So for a virus to be successful it has to find just the right balance. The most successful virus is that which can maintain a constant presence in a population, such as dengue virus. And when that happens the disease becomes *endemic* to that region.

Pandemics in the modern world During the first world war a deadly pandemic swept throughout the globe killing more people than the war itself. The virus responsible was called *Influenza A H1N1*. It was named the *Spanish Flu* because all other nations except Spain suppressed the report of the disease for the sake of the war effort. No adequate measure was taken to contain the disease and the medical science of the time was ill equipped to handle the challenge. Numbers are hard to estimate but almost 50 million[1] people are considered to have died from the pandemic.

There have been regular pandemics by the *Influenza A* virus ever since, but none as deadly as the Spanish Flu. Influenza changes itself regularly giving rise to multiple subtypes of the virus. For example the Asian Flu of 1957 was caused by *Influenza A H2N2* and the Hong Kong Flu of 1968 was caused by *Influenza A H3N2*.

The last major pandemic by Influenza was in 2009 when a new variation of the *Influenza A H1N1* returned to cause havoc worldwide. This Influenza was proposed to have originated from the mixing of multiple Influenza viruses of humans, birds and pigs. Hence it was nicknamed the *Swine Flu*. It was much more infectious than the Spanish Flu but not as lethal. It claimed the lives of around 284,000 people[2] worldwide.

In recent years a new contender has risen to rival Influenza, corona virus. By themselves corona viruses are not so bad, they just cause common cold. However some variations of them can quickly become far more infectious and far more deadly. They have already caused two rather deadly outbreaks in recent years, Severe Acute Respiratory Syndrome or *SARS* in 2002 and Middle East Respiratory Syndrome or *MERS* in 2012. *SARS* was contained within two years but *MERS* became endemic in some countries and continues to infect people even to this day. Corona virus would return to limelight again before the end of the decade.

Course of a viral pandemic A pandemic spreads so rapidly and so fast because the population has no immunity against it. Any person who is infected will either die or recover. If the person recovers then he/she develops immunity to the virus and is usually not infected again. So as long as there are uninfected people in an area, the virus can quickly spread there. But as