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CHAPTER 1

A case of 2019-nCoV novel coronavirus outbreak

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1.1 Introduction

Pandemics and epidemics occurred in history umpteen times infected and killed millions of people and tragically changed the course of human history. Some of these epidemics or pandemics are caused by zoonosis (a type of disease transmitted from an animal or insects to humans causing mild illness to lethal illness). Zoonotic diseases are caused by:

- Virus
- Bacteria
- Fungus
- Parasites

They are transmitted via air, close contact with an infected animal, insect bites like mosquitoes and ticks, or by eating contaminated meat or produce \cite{1}. Scientists estimate that 6 out of 10 infectious diseases in people come from animals according to Centers for Disease Control \cite{2} (Fig. 1.1).

Let us understand the difference between epidemic and pandemic:

\textit{Epidemic}: An epidemic is defined as a sudden outbreak of disease that profligate and affects many individuals at the same time. It is typically confined to a specific group of people or area. Examples include meningococcal diseases.

\textit{Pandemic}: It is a type of epidemic that is bowed out in a wider geographic range and affects a significant portion of the population, various pandemics, according to Ref. \cite{4}, are discussed further:

- Plague of Justinian 541–542: The first recorded pandemic of the bubonic plague caused by \textit{Yersinia pestis}, spread by fleas carried on rodents. Symptoms of the disease were chills, malaise, fever, muscle cramps, seizures, gangrene, and buboes in the neck, armpits, and groin. The mortality rate was 80%. The estimated deaths per day at its peak were 5000.
The Black Death 1346–1350: The most devastating pandemic recorded in history caused by the bacterium Yersinia pestis; spread by fleas carried by rats; symptoms of the disease were chills, malaise, fever, muscle cramps, seizures, gangrene, and buboes in the neck, armpits, and groin, vomiting of blood. The mortality rate was about 30%–90%, the infected person died within 2–7 days and affected areas in Asia and Europe.

Third Cholera pandemic 1840–60: Cholera became health apprehensions during the mid-19th century. It was originated from India and was caused by Bacterium Vibrio cholera and was spread across the globe; symptoms are severe diarrhea, vomiting, and muscle cramps, which lead to extreme dehydration and the mortality rate was 50%–60%. The disease spread mostly by contaminated water and food.

Spanish flu (H1N1) 1918–20: It was the first of two pandemics caused by the H1N1 influenza virus. The rapid spread and origin of the H1N1 influenza virus were unknown; it affected worldwide and spread via coughing and sneezing; symptoms of the disease were fever, cough, runny nose, sore throat, aches, fatigue, bleeding from the nose ears, stomach, and intestines, over-driven immune system; the mortality rate was 20%; estimated deaths were 100 million. Social isolation was practiced resulting in canceling public events and closing the schools which significantly reduced the spread of the disease. Healthy young people were badly affected by the Spanish flu. The virus was deadly because it triggers a cytokine storm, which affects the strong immune system of young adults. The pandemic is named Spanish flu because one of the newspapers reported the effects of the epidemic in Spain, for instance, a serious...
ailment of King Alfonso XIII which created a misconception as Spain is badly affected by the disease.

• Asian flu (H2N2) 1957–58: Originated from an avian influenza–A virus, first reported in Singapore claiming 1.1 million lives across the globe; symptoms were cough and mild fever, and pneumonia. The rapid development of the vaccine and the availability of antibodies restricted the spread of infection and mortality.

• Hong Kong flu 1968–69: caused by influenza–A subtype H3N2 virus, it was highly contagious; in a short span, it spread throughout South–east Asia, the United States, the United Kingdom, many countries in Western Europe. The pandemic arose in two waves; the second wave caused more deaths than the first wave; mortality was high in infants and geriatrics. Symptoms chills, fever, muscle pain, and weakness.

• Swine flu (H1N1) 2009–10: It is also known as H1N1v (influenza in pigs) which is an amalgamation from pigs, birds, and humans. The virus causes a respiratory infection in humans, and the symptoms of this disease are fever, chills, cough, sore throat, runny nose or stuffy nose, watery red eyes, body aches, headache, fatigue, diarrhea, nausea, and vomiting. Symptoms are developed 1–3 days after the exposure to virus. The morbidity caused by influenza was high, whereas the mortality rate was 1%–4%. This virus has various complications including worsening of chronic conditions, heart disease, asthma, pneumonia, neurological signs; and different symptoms from seizures to respiratory failure. While there is no definite figure, according to Center for Disease Control and Protection (2020), it was estimated that 151,700–575,400 people worldwide died from H1N1 infection during the first year of the virus.

• COVID–19, 2020: This virus is also known as severe acute respiratory syndrome corona–virus 2 which was originated in China. The symptoms include fever, cough, sore throat, and muscle pain. Elderly inhabitants were more prone to be affected by the SARS disease. The mortality rate in SARS was very high.

1.1.1 History of coronavirus

A virus is a submicroscopic infectious agent that reproduces inside the living cells of an organism. The cell in which they multiply is called the host cell. A virus is made up of either DNA or RNA delimited with a protective protein coat called the capsid. Some viruses may also have an additional spikey coat called an envelope; the existence of these spikes helps in latching the host cell. Viruses are active when they are present inside the host cell and
inactive when outside the host cell. These viruses cause several infections. Illness caused by a virus is called a viral disease. Some of the viral diseases are [5]:

- **Respiratory** (contagious affect respiratory tract, for example, Flu, common cold, SARS, etc.)
- **Gastrointestinal** (contagious affect digestive tract may lead gastroenteritis, e.g. Rotavirus)
- **Exanthematous** (highly contagious cause skin rashes, e.g., measles, rubella, chickenpox, etc.)
- **Hepatic** (inflammation of the liver, e.g. Hepatitis A, B, C, D, E, etc., transmit body fluid, contaminated water or food)
- **Cutaneous** (contagious cause lesions on the skin, e.g., Warts, oral herpes, etc.)
- **Hemorrhagic** (Ebola, dengue fever, yellow fever)
- **Neurologic** (e.g., polio, viral meningitis, viral encephalitis, rabies)

A disease caused by a virus infecting the respiratory tract is called influenza which can be classified into four following groups:

- Influenza virus A (cause flu pandemic)
- Influenza virus B (cause seasonal flu)
- Influenza virus C (mild illness does not cause human flu epidemics)
- Influenza virus D (affect cattle but is unknown to cause human illnesses)

An internationally accepted convention is followed while naming the influenza viruses, and it is given in Fig. 1.2:

Fig. 1.2 depicts how influenza viruses were named. The name starts with the virus type, place virus was isolated, virus strain number, isolated year, and virus subtype.

Coronavirus is an immense family of viruses that spillover and taints the birds and animals. Camels and cats have also been reported of being infectious. These viruses seldom mutate in such a way that it infects another species possessing a way of cross-species transmission. They are classified into four categories [7]:

![Figure 1.2 Virus naming convention. (Image courtesy [6]).](image-url)
• Alpha coronavirus
• Beta coronavirus
• Gamma coronavirus
• Delta coronavirus

Alpha and Beta coronavirus primarily infect mammals whereas Gamma and Delta coronavirus infect avails. Among hundreds of coronaviruses, seven can cause disease in humans they are, according to Ref. [8]:
• alpha coronavirus (229E)
• alpha coronavirus (NL63)
• beta coronavirus (OC43)
• beta coronavirus (HKU1)
• the beta coronavirus that causes Middle East respiratory syndrome (MERS-CoV)
• the beta coronavirus that causes severe acute respiratory syndrome (SARS-CoV)

Four variations of nCov-19 are termed as “endemic” meaning commonly found in certain areas and people; they usually cause mild to moderate disease. However, the other three may cause severe to fatal disease.

Initially, coronavirus was diagnosed in chickens around the 1930s. A couple of decades later in the 1960s, the human coronavirus was spotted which tested positive for severe acute respiratory syndrome (SARS) in 2002 [9]. The illness showed COVID-19 symptoms including but not limited to fever, cough, sore throat, and muscle pain. Elderly inhabitants were more prone to be affected by the SARS disease. The mortality rate in SARS was very high.

In the Middle, Respiratory Syndrome (MERS-CoV-2012) was diagnosed in the human, the MERS-CoV infectious causes a gamut of respiratory illness, from asymptomatic to mild, and mild to fatal. There were two more outbreaks of MERS witnessed in South Korea and Saudi Arabia in the year 2018. The symptoms of SARS are apparent for medical professionals to identify and isolate the patient in time, the SARS infectious could likely infect two to three individuals on an average, and those positive contagious were reported to be associated in the close contact with infected camels or with a person already tested positive. Despite the high mortality rate of SARS and MERS, their outspread was observed to be under control.

1.1.2 Novel coronavirus-2019

Novel corona-virus-2019 (nCov-19) is a communicable ailment caused by severe acute respiratory syndrome (SARS-CoV-2), according to [10], that
was first identified in Wuhan, Hubei Province, China in November 2019. The virus is popularly known as COVID-19 (Fig. 1.3).

World Health Organization (WHO) declared the coronavirus as “pandemic” as the virus spread worldwide at lightning speed. The symptoms of COVID-19 are pyrexia and cough [11]. SARS-CoV-2 is a strain on respiratory syndrome-related coronavirus (SARSr-CoV) which is believed to have zoonotic origins and has close genetic similarity to the bat coronavirus as it emerged from a bat-borne virus. The virus may affect the upper and lower respiratory system. It may also cause respiratory failure, kidney injury, acute myocardial injury, damage cardiovascular system, and gastrointestinal organs. WHO has laid down standard testing protocol, real-time reverse transcription-polymerase chain reaction (rRT-PCR) (Fig. 1.4).

The virus is called “Novel Corona-19” because it is new (“novel”) to humans. The virus is named Corona because it appears as though the virus have a spike of crowns/Corona. The spiky structure of the virus latches onto the cell and attacks once it enters the human body and searches for the receptors (cells and proteins). If the virus finds the compatible receptors it starts replicating itself (coronavirus receptors are mostly found in lung cells and the gut) [12].

Fig. 1.5 shows how the coronavirus spreads in the human body:
1.1.3 Infectivity of COVID-19

Experts believe that the COVID-19 virus spreads primarily from person to person when in close contact. This virus is highly contagious and the transmission rate is very high. It is assumed that one person who is infected can spread the infection to 2–2.5 people. Another study discovered that one person affected by COVID-19 may infect 4.7–6.6 other people, according to [14]. The virus spread mostly through small droplets when an infected person coughs or sneezes leaving the droplets on the surface and objects around that person. There is a high probability of catching infection when other people come in contact with these contaminated objects or surfaces (Fig. 1.6).

Figure 1.6 Expelled droplets. (Image courtesy [13]).
A person may also get infected by breathing in droplets from a sick person. The virus is extremely contagious during the first 3 days and after the onset of symptoms, it may spread before the symptoms appear or from an asymptomatic person (one who does not show any symptoms). Therefore, it is suggested to stay 1 m (6 feet) away from a sick person, washing hands with soap and water for more than 20 s. The infection ranges from mild to lethal.

1.1.4 Clinical symptoms and its effect

The frequent symptoms of COVID-19 are fever, fatigue, dry cough, runny nose, aches and pains, sore throat, loss of smell and taste, nausea, or diarrhea. These are mild symptoms that develop slowly. Some infectious patients, however, do not show any symptoms as they do not feel the symptoms but still may infect others; Fig. 1.7 depicts the percentage of infectious sample. However, one in six people who acquire infection become critical and have shortness of breath (SOB), ongoing chest pain or stokes are also reported in some cases.

![Figure 1.7 Common diagnostic symptoms. (Image courtesy [13]).](image)
In severe cases, the virus may cause pneumonia, respiratory failure, septic shock, or death. Complications arise when the immune system is triggered by infection to flood bloodstreams with inflammatory proteins known as cytokines. They damage organs and kill the tissue. This condition is known as cytokine release syndrome or cytokine storm, according to Ref. [15]. Geriatrics age group and people with chronic or long-term illness such as hypertension, cardiac issues, or diabetes are at higher risk. Fig. 1.8 depicts the percentage of sample people at chronic conditions leading to high risk.

The preventive measures taken concerning the COVID-19 pandemic has tainted the lives of people all over the world. A survey held in March 2020 conducted in the United States reveals that numerous people have opted for unhealthy coping strategies, such as augmented alcohol and intake of marijuana, to help manage anxiety and depression [16]. Major concerns were expressed in the survey which included finance rather than medical. About 47% of respondents expressed their worries on not being able to pay their bills while 53% were worried their bank balance would not last long. The same survey also revealed that the respondents were seeking to take affirmative action to improve their situation.

Figure 1.8 Chronic conditions leading to high risk.
Some of the healthy coping strategies to make life better at this uncertain time are [17]:

- Exercise
- Yoga
- Meditation
- Forms of prayers

Numerous studies indicate that physical activity, yoga, meditation, and prayer are all linked to the well-being of a person.

- A healthy lifestyle, fit body, and a relaxed mind can combat the COVID-19 crisis. The sudden outbreak of disease and lock-down had a negative impact on our minds and bodies leading to insomnia, headaches, indigestion, and poor immunity. Taking care of oneself can bring back a healthy environment.
- Neurology research shows healthy relationships and connections with others are two essential elements in extenuating the effects of trauma. It is difficult to be creative in being emotionally close but physically distant.
- Indulging in activities that give happiness/joy or helps manage stress can be of help.

1.2 Necessary precautions

- There is no explicit therapeutic regimen or vaccine available for COVID-19; therefore, prevention appears to be the best cure. The following are the preventive measures for COVID-19, according to Ref. [18]:
- Timely identification and isolation/quarantining of suspected or confirmed COVID-19 person
- Hand hygiene is the most important strategy in the prevention of transmission of infection
- Keep away from touching mouth, eyes, and nose
- Cover your face while coughing and sneezing with tissues, then dispose of the tissue safely
- Stay away from close contact with infected people. Maintain 3-feet distance
- Stay at home when you are sick
- Disinfecting surfaces and frequently touching objects
- Seek medical help immediately if you or your loved ones have fever, cough, or difficulty in breathing
- Wear a mask when in public places where social distancing is difficult to maintain or taking care of a person with suspected COVID-19 infection
1.2.1 Appropriate mask and its availability

Mask usage is crucial in preventing respiratory droplets from traveling into the air as it prevents others in spreading the coughs or sneezes; this is referred to as source control. Mask plays the role of a barrier when worn properly over the nose and mouth. Wearing a mask is highly recommended specifically where physical distancing is difficult to maintain.

There are mainly three types of masks as shown in Fig. 1.9 [19]:

- Cloth face mask
- Surgical mask
- N95 respirator

Cloth masks are made at home from common material and are unlimited in supply. These masks may lower the risk of transmitting the virus while coughing, sneezing, or speaking. They are better than not wearing any mask especially when physical distancing is hard to maintain. Cloth masks give a false sense of security.

Surgical masks are said to be more effective than cloth mask as these are single-use/disposable loose-fitting mask that covers nose, mouth, and chin. It is used to protect oneself from the spray, splashes, and respiratory droplets. The surgical mask prevents transmission of potentially infectious secretions from one person to the other person.

N95 respiratory masks are tight-fitting face masks that can filter 95% of airborne particles including viruses and bacteria in addition to large droplets,

![Figure 1.9 Types of masks. Image courtesy (Bing images).](image_url)
sprays, or splashes. N95 masks are generally round/oval designed to form a tight seal over the face and the elastic band holds it firmly. Some of the N95 masks have an exhalation valve, which helps in breathing. It is said that the N95 mask is 50 times more effective than a cloth mask.

There is a global shortage of surgical masks and N95 respirators; the reason for the shortage is due to a sudden increase in the demand/usage with regard to the coronavirus pandemic. One of the reasons for the shortage in supply of masks is that China uses to make half the world's face mask before the pandemic and most of the US factories that make masks get raw material (melt-brown fabric) from China.

China is making 200 million face masks per day which is 20 times more than the number in early February [20]. However, that is still not enough to meet local demand. Factories that are used to make shoes, iPhones, cars, etc. are retooled to make a mask.

1.2.2 Role of disinfectants
Disinfectants play a vital role in infection control. Disinfectants are in liquid form, sprays, or wipes they are designed for use on the surface to kill bacteria and viruses, according to Ref. [21]. To ensure the efficacy of disinfectants, a user should be aware of how to use them properly.

Coronavirus is an enveloped virus meaning they have an outer membrane. Enveloped viruses are comparatively easier to kill than nonenveloped viruses. The outer layer of the virus can easily be damaged by most of the environmental disinfectants, provided they are used according to the instructions on the label. Disinfectant contains more than or equal to 70% of alcohol, quaternary ammonia compound household bleach is most suitable. Attention should be given to hazardous warnings on the label.

1.2.3 Immunity boosters
Immunity is the defense system of our body. Balance diet, regular physical activity, having enough sleep, and not smoking and not consuming alcohol are some noteworthy habits to have a healthy immune system which decreases the chance of infection and disease. Besides, supplements or diet, physical distancing, and hand hygiene practices should be practiced for protection against COVID-19. In addition to the earlier-mentioned measures, consumption of the supplements with certain vitamins, minerals, and herbs can improve immunity, thus protecting against illness.
Some of the supplements that can boost immunity are [22]:

- **Vitamin D** is a fat-soluble nutrient important for the immune system. In-take of healthy levels of this vitamin may help lower the risk of respiratory infection.
- **Zinc** is a mineral that boosts immunity and is essential for immune cell development and communication. It plays a crucial role in the inflammatory response and supplementing zinc helps in protecting against the respiratory tract which reduces the duration of these infections.
- **Vitamin C** is crucial for immune health as it is a powerful antioxidant that protects against free radicals. It reduces the duration and severity of upper respiratory system infection including the common cold.
- Some of the foods, spices, proteins, and herbs that can boost immunity which includes, but not limited to ginger, garlic, turmeric, black pepper, cumin, bishops weed, fennel, fenugreek seeds, clove, fennel seeds, cardamom, cinnamon tulsi/basil, lemongrass, oregano, thyme, lentils, pulses, legumes and beans, according to Ref. [23].
- **Star anise** contains shikimic acid, the active ingredient in Tamiflu. This is a medicine used to treat the influenza virus, whereas COVID-19 is a mutated virus; star anise helps in boosting immunity.
- **Raw and unpasteurized honey** (Fig. 1.10).

![Immunity boosters. Image courtesy (Bing images).](image-url)
1.3 Demystify COVID-19

Coronavirus is a vibrant and perplexing disease that is abundant with fake news and myths. It is important to have correct information on the disease to take preventative measures.

Usually, epidemics leave a negative impact on people who suffer from such diseases or who are suspected of such diseases. COVID-19 is one such disease that has caused a global negative impact on health and the economy. COVID-19 has significantly increased morbidity and mortality in many countries. COVID-19 is a global outbreak that has brought with it fear, anxiety, prejudices against people and communities along with social isolation and stigma. Such behavior leads to antagonism, chaos, and unnecessary social disruptions. Stigma and fear are the results of people's poor knowledge about anything.

In the past, people with diseases like tuberculosis, HIV, and severe acute respiratory syndrome have faced discrimination and stigma, which force people to avoid testing or late testing of any such disease until the infection is increased. People who were tested positive often become fearful of seeking medical help or even do not want to discuss their symptoms. The same is the case with COVID-19. Due to the fear of social stigma, people are hiding their illness and avoiding screening while not seeking healthcare in time is a matter of concern. Discrimination is not restricted to the person who is ill, but the entire family is under the radar; as a result, family members also hide the symptoms of a sick person.

Due to a lack of knowledge about the coronavirus, certain words like the suspected case, isolation, and quarantine have created a negative impact on people and resulted in stigmatizing attitudes. COVID-19 is highly infectious as it spreads fast and can infect anyone. Despite all precautions, if COVID-19 is tested positive in an individual, they should be treated with love and care.

1.3.1 Suspicious symptoms

COVID-19 is a respiratory imbalance caused by coronaviruses. It can cause a wide range of unusual symptoms including but not limited to, according to [14]

- Pink-eye
- Swollen-eyes
- Fainting
- Guillain–Barre syndrome
A case of 2019-nCoV novel coronavirus outbreak

- Coughing up blood
- Blood clots
- Seizures
- Heart problems
- Kidney damage
- Liver problem or damage

1.3.2 Available approaches for treatment

The virus affects people differently depending on age and underlying medical conditions. If COVID-19 is categorized based on the severity of illness, the criteria in each group may vary across guidelines and clinical trials.

- Asymptomatic: People who were tested positive for COVID-19, but had no symptoms are called asymptomatic patients. In this case, self-isolation/home quarantine is suggested. If remained asymptomatic can discontinue isolation after 10 days from the date of the first positive COVID test, according to [24].
- Mild illness (according to Ref. [24]): Individuals who have symptoms of COVID-19 such as fever, cough, sore throat, or abnormal chest imaging are considered to be mildly ill. Mostly these patients can be treated/cared at home through tele-medicine or remote visits. Symptomatic patients and risk factors for severe disease should be closely monitored.
- Moderate illness (according to Ref. [24]): Individuals who have evidence of lower respiratory infection by clinical assessment or imaging, when treated with a saturation of oxygen ≥94% on room temperature can reduce air pulmonary disease. The empiric antibiotic is required if bacterial pneumonia/sepsis is strongly suspected. Daily re-evaluation is required and if there is no bacterial infection, antibiotics can be stopped.
- Severe illness (according to Ref. [24]): This includes individuals who have a respiratory frequency of >30 breaths/min, SpO₂ <94%, <300 mmHg, or lung infiltrates >50%. These patients may experience rapid clinical deterioration and will likely need to undergo aerosol-generating procedures. These individuals require immediate oxygen therapy. If secondary bacterial pneumonia/sepsis is suspected, empiric antibiotics and daily re-evaluation are required. If there is no evidence of bacterial infection, antibiotics can be de-escalated.
- Critical illness: Individuals who have respiratory failure, septic shock, or multiple organ dysfunction are termed as critically ill. These patients are extrapolated with other life-threatening infections. Presently there is limited information to propose the critical care management of
COVID-19 patients. However, precautions to prevent environmental contamination are warranted.

### 1.3.3 Medical observation

The observation period is defined as 14 days after exposure to COVID-19 and is set based on the incubation time from virus exposure to illness. Around 7–8 individuals usually require monitoring and restriction of movements (i.e., home quarantine and quarantine stations). These individuals are required to complete 14 days of medical observation before they are given medical clearance, according to Ref. [25].

Not all the patients tested positive for COVID-19 are required to be hospitalized, according to Ref. [26]. Patients who require medical care should be hospitalized under appropriate supervision and precautions. Some patients with mild clinical symptoms may deteriorate in the second week of illness. The decision to monitor these patients should be made on individual basis. The decision depends not only on the clinical presentation but also on the patient's ability to self-monitoring the symptoms.

Patients can be discharged from the hospital when the tests are negative and the virus deteriorates in the body. If the patient returns home before the period recommended for discontinuation of the hospital, they should be quarantined at home or a better place.

### 1.3.4 Reinfection

Reports from China have shown 90% of COVID-19 patients recovered, whereas the remaining 5% tested positive for the virus after undergoing prescribed treatment [27].

Dr. Peng Zhiyong is the Director of Intensive Care Unit in Zhongnan Hospital of Wuhan University. He, along with his team, since April has been monitoring 100 recovered patients. The average age of the patients was 59 years. The first phase of the study was completed in July and about 90% of the patients’ had their lungs in damaged state. These results were first reported by Global Times, an English-language Chinese newspaper.

The team also noticed that no antibodies were found against COVID-19 among 10% of 100 patients. 5% of them who were tested for IgM (Immunoglobulin) show positive test results indicating the presence of infection in the person. Thus, doctors are ambiguous about re-infection in recovered patients.
The low level of B cells is a primary force for killing viruses in the human body. This was demonstrated by a high level of T cells which recognize viral antigens outside infected cells. This means that the immune systems are yet to be recovered.

Reports on the probability of coronavirus re-infection have raised doubts in people if humans are immune to the virus. A recent study found that the antibodies in asymptomatic patients reduce in about 2–3 months. Researches in the study tracked 37 symptomatic and 37 asymptomatic patients for 8 weeks from hospital discharge. They notice dropped IgG levels in 93% asymptomatic patients. Another study on coronaviruses has demonstrated about 50% decline in antibody levels among patients, who recovered from COVID-19 within 6 months. SARS-CoV-2 is also a member of the coronavirus family and it has several similar characteristics. Researchers point out the possibility of reinfection in about 96.8% symptomatic patients in the convalescent phase. They also noticed a decline in neutralizing antibodies in 62% of the symptomatic and 81% of asymptomatic patients.

1.4 Dispelling rumors

Many things are still mysterious about coronavirus. What we know now is that COVID-19 illnesses range from mild to severe illness leading to sluggishness. There is no vaccine and certain things about the virus which makes it predominantly fast in spreading from person to person. Therefore, false information in this regard may lead to serious consequences. A new research study reveals that rumors related to COVID-19 were associated with thousands of hospitalizations and hundreds of deaths. The following are the myths, which have taken root in the rumor mill. It should be kept in mind that they are all illogical, according to Ref. [28]:

- Drinking plenty of water will kill COVID-19. Staying hydrated is good, however, hydration only cannot protect against coronavirus.
- A daily intake of vitamin C supplements, essential oils, colloidal silver soap, sesame oil, garlic, or fish tank cleaner, etc. will guard the virus. None of them are clinically proven to be effective against COVID-19.
- Perception of vacationing in warm climate helps avoid infection. COVID-19 can survive in both cold and warm climatic conditions. The global outbreak of the disease is evident.
- Holding the breath for more than 10 s without coughing will prove that a person does not have COVID-19—there is no medical evidence for it.
• Drinking highly concentrated alcohol will kill coronavirus. The report says thousands of people were hospitalized, hundreds of deaths were reported, and several people lost their vision due to methanol poisoning.
• One of the most dangerous rumors is drinking bleach will kill COVID-19.

To negate the dispelling rumors, government and health agencies should continue publishing proven scientific information about COVID-19 on their websites. These agencies should not only expose COVID-19 rumors but also connect with social media to spread correct information. The greatest weapons of this time are mask, physical distancing, hand hygiene practices, not touching the face, and following the suggestion to stay at home.

1.4.1 Young people and COVID-19
The COVID-19 pandemic has disturbed humans across the globe. The lockdowns have left a deep impact on jobs, education, and mental health of young people resulting in anxiety, depression, and uncertainty [29]. According to a survey by the International Labour Organisation (ILO), a United Nations agency, more than a third of young people are uncertain about their career due to the pandemic. Young people who were employed before the outbreak had to stop working in view of COVID-19, among the employed youths, the working hours fell by nearly a quarter, and two out of five young people reported a reduction in their income. Young people in under-developed countries are exposed to reductions in working hours, resulting in contraction of income. A survey report mentions how the effect of the pandemic is higher in young people and the social and economic integration is an ongoing challenge. A call for urgent action if taken among young people will likely reduce the suffering; otherwise, it will leave a long-lasting impact from the pandemic.

1.4.2 Medicines available for curing virus
There is no explicit treatment for COVID-19. People with mild infection can be treated at home. Antibiotics do not help as they treat bacteria and not viruses. If a COVID-19 positive individual is prescribed antibiotics, then it is for an infection that came along with the disease. People with severe symptoms need to be cared for in the hospital.

The following are some treatment options that are now in practice against SARS-CoV2, according to Ref. [15]:
• Remdesivir is proven highly effective in treating the novel Corona-virus, it is a broad-spectrum antiviral drug that is designed to target Ebola. FDA has approved its use for COVID-19 hospitalized patients.
• Tocilizumab is a medication used to treat autoimmune conditions which have proven to be effective in treating COVID-19.
• Convalescent plasma is an experimental treatment use for COVID-19 patients; wherein plasma of a person who has recovered from COVID-19 is transfused to moderately or severely ill patients. FDA has also approved clinical trials for convalescent plasma.
• Chloroquine and hydroxychloroquine are recommended for COVID-19 patients the drug is used to treat malaria and autoimmune conditions like rheumatoid arthritis and lupus
• Lopinavir and ritonavir when used in combination demonstrated a significant reduction in the levels of coronavirus. Kaletra is the brand name of LPV/r designed to treat HIV. According to WHO, using Kaletra in combination with other drugs could be beneficial for COVID-19 patients.
• Favilavir is an antiviral drug that was developed to treat inflammation in the nose and throat. In a clinical trial of 70 people, the drug is shown to be effective in treating patients with COVID-19. China has approved the use of this drug.

1.5 Conclusion

There are several coronaviruses and the vast majority flows in creatures. Only seven of these infections taint people and four of these cause indications of the regular virus. However, over the most recent 20 years, a COVID has hopped from creatures to people to cause extreme malady.

SARS is a beta-COVID which rose in 2002. However, it was controlled by general measures. There have been no new cases since 2004. MERS exists in camels and rose in 2002. It tainted individuals who have close contact with them.

Coronavirus, a new and deadly disease causes lethal respiratory ailment which is expected to have started in a live creature market in China. It spread quickly all through the nation and the world.

The COVID-19 was identified in Wuhan, China in December 2019. A huge number of individuals were tainted in China as the infection spread effectively from individual-to-individual in many parts of the nation. COVID-19 disease was related to movement from Wuhan; however, the infection now has settled in 177 nations and spread around the globe. The health authorities in the United States and around the globe are attempting to control the spread of the infection through general well-being measures including but not limited to, social separating, contact following, testing,
isolates, and travel limitations. Researchers are attempting to discover drugs to treat the ailment and develop an antibody.

The World Health Organization, on January 30, 2020, proclaimed COVID-19 as “a public health emergency of international concern.” On March 11, 2020, after the spread of the virus outside of China, the World Health Organization proclaimed the COVID-19 plague as a pandemic. General well-being estimates that the ones executed in China and around the globe will ideally stop the spread of the infection while the medicines and an antibody are under-development to prevent the spread of the virus. [3,13,30–35].

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