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A Review: Coronavirus, its types, and Impact of COVID-19 on Global Wealth

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Abstract

The virus can multiply itself and their genetic code mostly includes either RNA or DNA. In many different ways, the various types of viral species are spread. For examples, Human immunodeficiency virus is transferred through body fluids, plant viruses are transferred from plant to plant by insects and other organisms, Severe Acute Respiratory Syndrome virus transmitted by humans and animals, COVID-19 is a respiratory virus that transmitted mainly through direct contact with an infected individual by respiratory droplets when the infected person coughs or sneezes, or by saliva droplets or nose discharge. Coronaviruses are the viruses that belong to the class Coronaviridae and subclass Ortho-coronavirinae, order Nidovirales. Some human coronavirus infections are mild, but Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) human coronaviruses transmission from animals to humans, have caused more than ten thousand cumulative cases in the past two decades. And now a novel coronavirus namely known as COVID-19 is a unique strain which has not been previously recognized in humans emerged as the most important global health threats. Thus this study aims to assess the awareness of this COVID-19 among the general public and to provide basic information such as signs and symptoms, origin, diagnostic method, treatment, prevention recommended by WHO and impact of COVID-19 on global wealth. Global stock exchange has a drop-down rapidly as stock investors continue to worry about the broader economic effects of the COVID-19.

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INTRODUCTION

Coronaviruses are the viruses that belong to the class Coronaviridae and subclass Ortho-coronavirinae, order Nidovirales (De Groot *et al.*, 2011). The name "coronavirus" is derived from the Latin word Corona and the Greek word korõnē, which means crown. While evaluating beneath an electron microscope, it notifies the presence of Virions i.e. the infectious form of the virus, which has a huge fringe, reminiscent of either royal crown or a solar corona. Coronaviruses are enveloped positive-sense RNA virusesstarting from 60 nm to 140 nm in diameter with spike-likeprojections on its outer surface giving it a crown-like appearance under the electron microscope; that is why called as coronavirus (Richman *et al.*, 2016; Woo *et al.*, 2010).

Coronaviruses are zoonotic pathogens with a high mutation rate which might be present in humans and many animals with a broad range of clinical features from asymptomatic course to requirement

of hospitalization in the intensive care unit; inducing infections in respiratory, gastrointestinal, neurologic and hepatic systems (Drexler *et al.*, 2010; Yin and Wunderink, 2018).

Since 2002 outbreaks of the Severe Acute Respiratory Syndrome (SARS) and in 2012 Middle East Respiratory Syndrome (MERS), the risk of coronavirus transmission from animals to humans has been verified. (Cui *et al.*, 2019; Cauchemez *et al.*, 2013). Human coronavirus shows a major class of coronavirus connected with various multiple respiratory diseases of different severity including common cold, cough, bronchitis, and pneumonia (Pene *et al.*, 2003). After Severe Acute Respiratory Syndrome more than 20 extra novel coronavirus with complete genome sequences have been recognized (Lau *et al.*, 2011) and presently, seven human coronaviruses were classified along with recent 2019 novel coronavirus. These types of human coronavirus are divided into four types such as alpha, beta, gamma, and delta coronaviruses. The first human coronavirus was diagnosed in 1960 and to present, there are seven human coronaviruses were recognized as follows:

1. 229E (alpha coronavirus)
2. NL63 (alpha coronavirus)
3. OC43 (beta coronavirus)
4. HKU1 (beta coronavirus)
5. MERS-CoV (the beta coronavirus that induces Middle East Respiratory Syndrome)
6. SARS-CoV (the beta coronavirus that induces Severe Acute Respiratory Syndrome)
7. COVID-19

Table 1: Numbers of new cases are identified, primarily in Ten Asian countries (Date:04/07/2020)

Country	Cases	Deaths	Region
India	661,233	18,912	Asia
Iran	237,878	11,408	Asia
Pakistan	225,283	4,619	Asia
Saudi Arabia	205,929	1,858	Asia
Turkey	203,456	5,186	Asia
Bangladesh	159,679	1,997	Asia
Qatar	99,183	123	Asia
China	83,545	4,634	Asia
Indonesia	62,142	3,089	Asia
Iraq	58,354	2,368	Asia

www.worldometer.info

Human coronaviruses 229E, NL63, OC43, and HKU1 were generally infected in humans worldwide. Human coronavirus 229E (HCoV-229E) is one of the first reported types of coronavirus variants. It is associated with common symptoms of cold in healthy adults (Vassilara *et al.*, 2018).

A new human coronavirus (HCoV-NL63) was reported in a seven-month-old infant with respiratory symptoms in Holland in 2004. Subsequently, this virus was found in many countries, indicating a spread worldwide. NL63 (alpha coronavirus) is commonly infected children and those immunocompromised with either mild upper respiratory symptoms like cough, fever, and rhinorrhoea or intense LRTI, which includes bronchiolitis and croup, perceived normally in younger children (Abdul-Rasool and Fielding, 2010). It is evaluated that 1 to 10 percent of the human population is affected yearly by cold-like symptoms of HCoV-NL63 (Szelazek *et al.*, 2017).

While it was understood that human coronavirus OC43 (HCoV-OC43) reported for 5 to 30 percent of human respiratory tract infections (Vijgen *et al.*, 2006). Both HCoV-OC43 and HCoV-229E affect otitis media and LRTI. Even though the virus-infected person stool containing particles like coronavirus, no proof was observed that both the viruses may affect enteric disease in humans (Burrell *et al.*, 2017).

The first-class A human -CoVHKU1virus was isolated in 2004 in Hong Kong and was later determined worldwide in humans. Just like other human coronaviruses, this new coronavirus HCoV-HKU1 is also affecting 0.9 percent of LRTI and URTI (Woo *et al.*, 2009). HCoV-HKU1 like respiratory tract infections are the same as other respiratory viruses. Mostly the URTI patients reported with fever, dry cough, and running nose; while LRTI patients having fever, productive cough, and dyspnea type of symptoms. Generally, children under the age of six are predicted for exposure to HKU1 (Zhou *et al.*, 2013). Normally, HKU1 infections cause moderate URTI and in some patients, it shows extreme respiratory infections, inclusive of pneumonia in geriatric, pediatric, and patients with immunocompromise (Gralinski and Baric, 2015).

Coronaviruses are typically infecting animals and sometimes it can develop as a new human coronavirus and make human beings sick. The SARS-CoV, MERS-CoV and COVID 19, are three recent examples of that.

Severe acute respiratory syndrome coronavirus (SARS-CoV) was first reported in November 2002. SARS-CoV was taken into considerationas an animal virus which regularly transmitted to other species (civet cats) and first affected individuals in south-

ern China's Guang-dong province in 2002 from an unknown source of animals, possibly bats. SARS CoV mainly includes fever but extreme cases often grow immediately, resulting in respiratory failure and requiring intensive treatment. In 2002-2003 it triggered a worldwide epidemic of 8,098 suspected cases and 774 deaths (Drosten *et al.*, 2003). No confirmed cases of SARS-CoV infection have been reported in any part of the nations since 2004. SARS-CoV is generally a transmission from human to human that occurs in the health care environment, in the absence of enough measures to prevent infection. Implementation of correct practices to control infection brought an end to the world outbreak (Tsang *et al.*, 2003).

The first case of the Middle East Respiratory Syndrome Coronavirus (MERS-CoV) case was diagnosed in the year 2012 in Saudi Arabia (Butler, 2012). A total number of 2499 laboratory-confirmed cases of MERS-CoV were reported worldwide at the end of December 2019, including 861 related deaths (case fatality rate: 34.4%). Most of the reported cases from Saudi Arabia are 783 deaths in 2106 cases, with a 37.2% fatality rate (Organization, 2019).

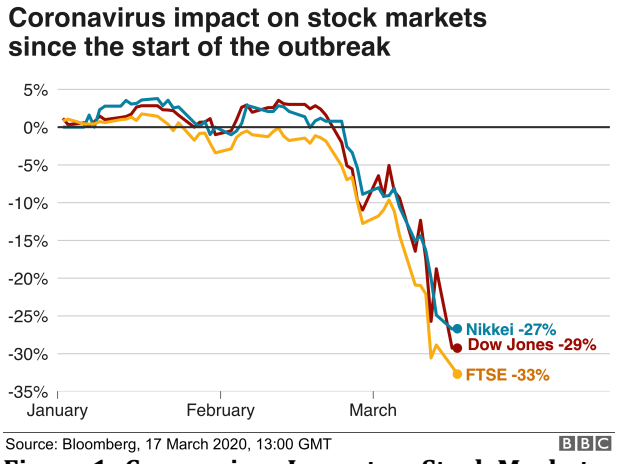

Figure 1: Coronavirus Impact on Stock Markets

COVID-19

The unknown pneumonia case in December 2019 has been reported firstly in Huanan Seafood Market, Wuhan city of china and all other coronaviruses were studied out by testing laboratory. Chinese authorities announced on 7 January 2020 that a new type of Coronavirus i.e. Novel Coronavirus, (nCoV) was reported (BMJ, 2020).

The outbreak of this virus is widening its wings to various parts of the world as faster as that World Health Organization (WHO) has declared this as "Public Health Emergency of International Concern" (Imai *et al.*, 2020).

On 12 January 2020, WHO temporarily named the virus (2019-nCoV) and finally named COVID-19 on 11 February 2020 (Rai *et al.*, 2020). Numbers of new cases are identified, primarily in Ten Asian countries (Table 1), (Worldometer, 2020).

Origin

How COVID-19 came to Wuhan city of China is presently unknown, but 66 percent of the initially reported cases (27/41) were directly connected to the Huanan Seafood market, Wuhan city of China (Huang *et al.*, 2020).

Transmission

COVID-19 is a respiratory virus that transmitted mainly through direct contact with an infected individual by respiratory droplets when the infected person coughs or sneezes, or by saliva droplets or nose discharge (Chan *et al.*, 2020). Covering of mouth and nose with handkerchief, tissue or flexed elbow, especially during coughing or sneezing, and immediate disposal of the same after use. Periodic sanitization of hands by using an alcohol-based hand sanitizer which contains at least 70% v/v concentration of ethyl alcohol or isopropyl alcohol, or regular washing of hands with soap and water ((EMRO), 2020).

Signs and Symptoms

Normally signs and symptoms of infection include shortness of breath, fever, and cough, and Difficulties during breathing. In a more extreme situation, the infection can cause pneumonia, extreme acute respiratory syndrome, kidney failure, and maybe death.

According to the National Health Service and World Health Organization, signs and symptoms include:

- Feeling tired and sleepy
- Difficulties during breathing
- Increase body temperature
- A dry cough
- Throat pain

These signs and symptoms of infections are comparatively the same as other respiratory infections such as flu and the common cold. These signs and symptoms of infections are observed between 2 and 14 days after infected by the virus (CDC, 2020).

Diagnostic methods

Viral RNA is analysed by targeting a consensus RDR region of pan -CoV. This is done by RT-PCR i.e. a real-time reverse transcription PCR assay. Virus assayed

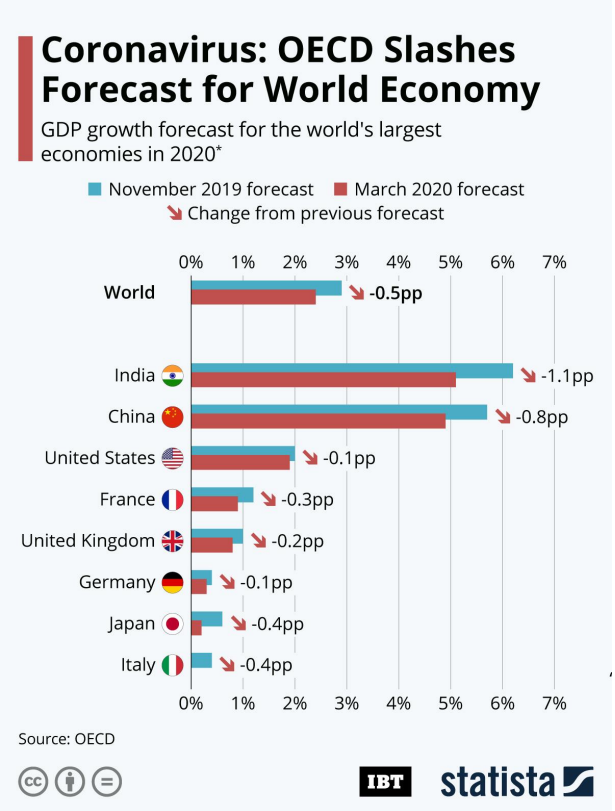

Figure 2: Gross Domestic Product growth forecast for the world's largest economies in 2020

from the clinical moieties is tested with the epithelial cells of patient's airway and Vero E6 and Huh-7 cell lines (Kothai and Arul, 2019).

Treatment

There is presently no particular vaccine or treatment available for COVID-19 infection and extreme cases, current treatment includes care to support vital organs functions. Various therapeutic choices including ribavirin, interferon alfa and ritonavir or lopinavir are given in combination. Interferons with ribavirin give a defined effect on coronavirus infection. In the other way therapies with antibody and plasma obtained from the convalescent patient, cases have recommended as a treatment. Controlling and identifying the source of infection, early diagnosis, identification, isolation, supportive remedies or treatments is the correct way to deal with extreme infections of coronavirus and timely reporting epidemic information to keep away from needless panic. For all human beings, good personal hygiene fitted masks, good ventilation and distancing away from crowded places will support to prevent coronavirus infection (Al-Osail and Al-Wazzah, 2017).

Prevention recommended by WHO for the general public

WHO provides the following standard recommendations protocols for the common people to reduce the exposure and contain the infections, which mainly includes hand and respiratory hygiene, and safe food intake and delivery practices:Periodic sanitization of hands by using an alcohol-based hand sanitizer which contains at least 70% v/v concentration of ethyl alcohol or isopropyl alcohol, or regular washing of hands with soap and water for considerable amount of time.

Periodic sanitization of hands by using an alcohol-based hand sanitizer which contains at least 70% v/v concentration of ethyl alcohol or isopropyl alcohol, or regular washing of hands with soap and water for considerable amount of time.

Covering of mouth and nose with handkerchief, tissue or flexed elbow, especially during coughing or sneezing, and immediate disposal of the same after use.

Maintenance of social distancing norms as instructed.

In case of cough, difficulty in breathing and fever, healthcare provider must be contacted immediately and every detail of past travel history should be shared.

Raw food products or under cooked animal products should not be consumed. Milk, animal organs or raw meat should be handled carefully in order to protect cross-contamination with uncooked foods.

Strict maintenance of considerable distance from individuals having any signs and symptoms of respiratory infection like sneezing and coughing ((DON), 2020; Coronavirus, 2020).

COVID-19 and its effect on wealth in our global village

COVID-19 has adversely affected the economy of the entire globe. Poor are the worst hit by it. This has been documented and predicted earlier (Price-Smith, 2001) . United Nations has suggested that the pandemics threaten national security, (Davies, 2020) and this has already been observed in past centuries. A pandemic like this takes the globe economically, socially, psychologically way beyond its present time. A comprehensive study which was carried out during 1950-1991 involving 20 countries which had all the three groups of nations including developed, developing and underdeveloped revealed that the increasing prevalence of infectious diseases not only increases human mortality and morbidity rate but also result in the gradual erosion of State capacity and increase in

poverty (Bank, 2020). This economic decline that is caused due to the covid-19 has a unproductive and viscious effect on autonomy, fiscal resource, resilience, reach and responsiveness and legitimacy. There are various evidences showing that infectious diseases are heavy threat to national security and State power. The prevalence of infectious disease was found to cause a lot of difficulties in the ability of the state to maintain the armed forces in positions and well nourished, which in turn possessed a question on State security (Wilson, 2020).

Many factories in People's Republic of China, Republic of Korea and certain other countries where the toll of COVID-19 patients is very high had to be locked down just within a month of onset of the outbreak. As the supply chain to other countries of various non essential goods was interrupted, PRC had to adversely reduce its industrial production, thus undermining trade and economics. The world tourism body had estimated the overall expenditure of world tourism to be nearly US$ 22,000 million, which was however not at all accomplished because of travel bans imposed. The pandemic have already ruined global stock exchange markets directly and indirectly as shown in Figure 1 due to shut down of factories and various businesses. COVID-19 pandemic has been declared as the biggest threat to the global economy by World Trade Organization (WTO) and the Organization for Economic Cooperation and Development (OECD) after the financial crisis of 2008-2009 (Tandon, 2020).

In case the impact on leading economies turns out to be as extreme because the disruptions suffered by means China, the OECD warns that world growth ought to even drop to 1.5 percentage in 2020, almost half the rate originally projected.

The following Figure 2 shows the latest growth projections for the world's largest economies, in addition to the preceding forecast dating lower back to November 2019 (OECD, 2020).

CONCLUSION

In this review article, various types of coronaviruses that affect a wide variety of human and veterinary diseases have discussed. Coronaviruses are zoonotic pathogens with a high mutation rate which might be present in humans and many animals host cells and carry out their infection and replication. This article also includes signs and symptoms, origin, diagnostic method, treatment, prevention recommended by WHO and the impact of COVID-19 on global wealth. MERS-CoV and SARS-CoV can be transferred directly to humans from the dromedary camel required further studies. The latest methods of identification of viruses by RT-PCR assay was used to estimate viral RNA by targeting a consensus RDR pregion of pan -CoV. There is presently no particular vaccine or treatment available for COVID-19 infection and extreme cases, current treatment includes ribavirin, interferon alfa, and ritonavir or lopinavir are given in combination. Global stock exchange has a drop-down rapidly as stock investors continue to worry about the broader economic effects of the COVID-19. All over the world (04 July 2020) more than 530,291people are dead and more than 11,260,677 people are infected due to this deadly COVID-19 virus. 2020 showed the worst performance for the major stock market since the 2008-2009 financial crises. We should conduct a continuous health education campaign about the awareness of COVID-19 and also provide the general guidelines & some basic information about symptoms, spreading patterns, mutation, infection, care and prevention of COVID-19.

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Conflict of Interest

None.

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