

## Review Article

### The Controversial COVID-19 Pandemic: Across Europe and the United States of America

Saira Jahangir<sup>1</sup>, Muhammad Rashid<sup>2</sup>, Zaid Nairoukh<sup>1</sup> and Dennis Adjepong<sup>3\*</sup>

<sup>1</sup>California Institute of Behavioural Neuroscience & Psychology, USA

<sup>2</sup>Punjab University College of Information Technology, Pakistan

<sup>3</sup>Department of Neurological Surgery, California Institute of Behavioral Neurosciences & Psychology, Fairfield, USA

#### Abstract

The COVID-19 Pandemic has become a controversial affair for the last couple of months. The virus has infected millions and killed hundreds of thousands of people around the world. This article aims to discuss different COVID-19 cases across the globe and share some exciting discoveries about the virus. The numeric information is taken from the original data sets available on Kaggle, accessed through links given in this research work. This research demonstrates the total number of COVID-19 cases in the U.S. and European countries. The total number of U.S. cases has grown up to two million (2.025164M). Due to this Pandemic, the death rate has increased across the globe. In European countries, the United Kingdom stands on top with a total of thirty-four million (34.078k) deaths. In this article, we present you some risk factors of Covid-19 and how to prevent an infection. Every Pandemic can heal if we look deeper into it. The vaccines and precautions can help deal with such viruses up to a great extent. Non-medical safeguards such as social distancing and lockdown measures worldwide help reduce this Pandemic as much as possible. The non-pharmaceutical methods of prevention reduced transmissibility by a maximum of 34% without resorting to a strict lockdown strategy. Infection control practices have improved over time due to these measures.

#### Introduction

Several pandemics have affected the human race. Among them include the plague pandemic in 1855, which killed an estimated twenty-five million (25M), and Spanish flu in 1918, which infected one-third of the world's population. However, humans fought against

\*Corresponding author: Adjepong Denni, Department of Neurological Surgery, California Institute of Behavioral Neurosciences & Psychology, Fairfield, United States; E-mail: adjepondennis1@gmail.com

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these pandemics and finally won. Recently the new advanced health system was able to control the SARS (Severe Acute Respiratory Syndrome) in 2002) and MERS (Middle East Respiratory Syndrome) in 2012 epidemics by early isolating and treatment of affected patients.

However, the COVID-19 Pandemic, which started in Wuhan, China, in December 2019, affected more than 14 million people and was responsible for more than six hundred thousand (600,000) deaths [1]. It is still alerting our life in many aspects, and the end of this Pandemic is not going to end soon.

COVID-19 Pandemic seems stronger than our health system. This virus won the first battle of the war; some features of this infectious disease, like long incubation period, highly contagious, the new style of our human life that contains easy travelling and lots of social communication [2]. This war is still on, and scientists have recently found some hope in some medications [3,4]. A new vaccine that effectively prevents the infection and may be available in the next few months [5], and more knowledge about the mode of transmission helps us avoid the spread of this Pandemic [6].

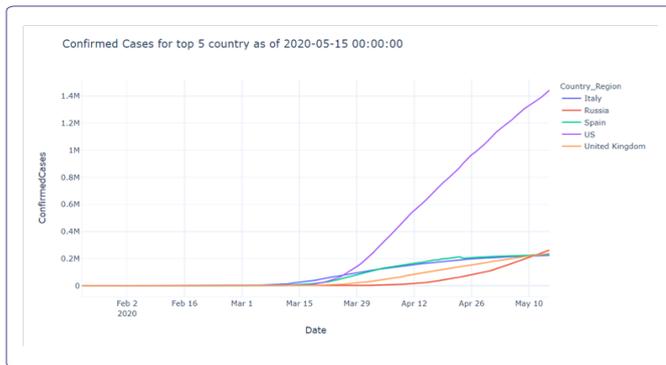
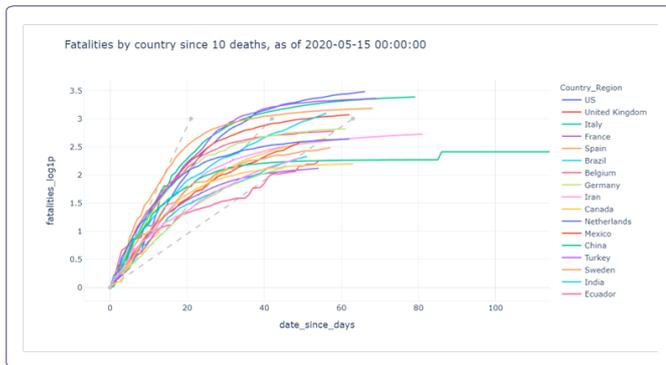
In this paper, we summarize what we have known about this virus. We compared the U.S. situation and the European situation. We discussed the mode of transmission, incubation period, environmental stability, viral genome origin, and possible mutation in this genome. Finally, we summarize the available method of management and treatment.

#### Discussion

In 2020 the coronavirus pandemic altered the lifestyle for many across the world. It is unclear when and how to resume daily activities as there are many challenges to overcome. In late 2019, the Coronavirus outbreak originated in Wuhan, China, and in March, it became and officially a pandemic. The virus, SARS-COV2, has infected millions and killed hundreds of thousands worldwide [7].

Positive cases of Coronavirus currently are about 2.5 million. Nearly a quarter of the global cases confirmed in the United States. In late March, the situation for COVID-19 got terrible in the United States. Many cases were declining in May, as most states across the United States placed lockdown orders. At the end of May, some parts of the United States began to ease restriction again, and some cases started to increase [8]. The United States tops with a total of two million (2.025164M) cases (last updated on April 28, 2020). This evidence is from the Data Set by Johns Hopkins accessible free on Kaggle [9].

According to COVID-19 global forecasting week 4 Data Set, the new confirmed cases have been increasing daily around the state and increases by twenty-four million (24.385k) daily (last updated April 26, 2020). With this massive amount of confirmed cases, the U.S. is part of the top 5 countries with a total one million (1.442653M) confirmed cases (last updated May 10, 2020) including other countries like Italy, Russia, Spain, and United Kingdom [10].



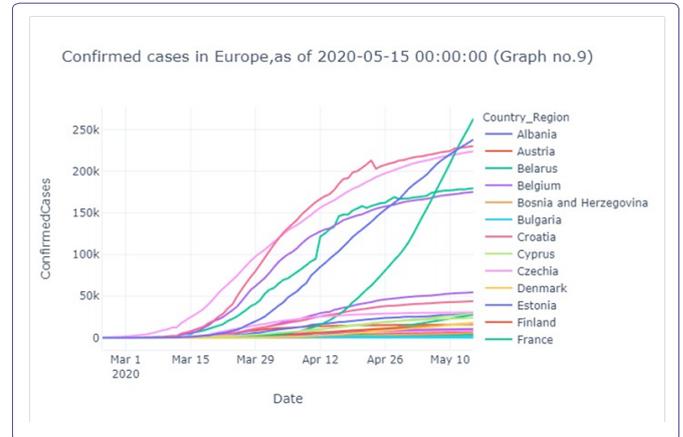
In recent weeks, these States brought outbreaks under control [8]. Public Health experts warned that the U.S. death toll could surge to 200,000 over the summer if unprecedented stay-at-home orders, closed businesses that kept most Americans indoors activities lifted after 30 days. However, most of the present restrictions on public life, including school closures and emergency orders keeping non-essential workers confined to their homes, flow from powers vested in state governors, not the president [11]. Many hospitals across south and west were flooded with patients having symptoms of COVID-19. This surge in the patient numbers forced hospitals to cancel elective surgeries and many patients were discharged earlier to keep more beds available. Even regular wards were converted into intensive care units and long-term care facilities are open for patients who are too sick to go home and are barely managing their condition [12].

## Europe Situation

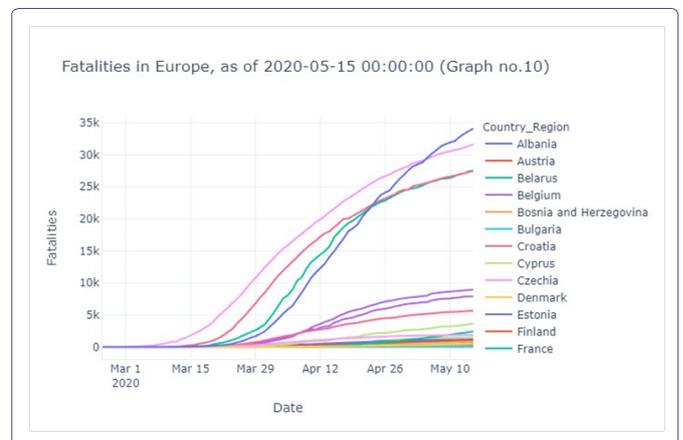
In Europe, the number of new deaths and infections of COVID-19 declines daily though there was a huge outbreak in the Pandemic. It is a promising sign of bringing hope to the continent. As of March 13, 2020, the new cases grew more than those of China. Due to these new cases, the World Health Organization (WHO) recognized Europe as the active focus of the COVID-19 Pandemic. As of March 18, 2020, more than 250 million people remained in lockdown across Europe. As of May 24, 68 days since its first recorded case, Montenegro became the first COVID-19-free country in Europe, but this situation lasted only 44 days before newly imported cases identified in Europe [13].

While European countries begin planning and carefully implementing measures to ease lockdown, the scale of the COVID-19 Pandemic on the global economy started to impact and difficulties to be precisely quantified. Throughout faced challenges, businesses were defined by shifting consumers' preferences and expectations and new public health concerns and approaches. Governments began various

measures to boost the economy and mitigate the impact of the outbreak [14]. The following data taken from the data set COVID-19 global forecasting week four accessible on Kaggle [10] (Graph no. 9).



The resulting data is representing confirmed cases in several countries of Europe. Russia, the most affected country with a total of two hundred and sixty-two million (262.843k), as displayed in the data. The United Kingdom in Europe was the second most affected country with a total of two hundred and thirty-eight million (238.004k) confirmed cases. Spain appears in the third place, with a total of two hundred thirty million (230.183k) confirmed cases across the continent. Additional states with approximately the same confirmed cases include Italy, France, and Germany. On May 15, 2020, this data refreshed [10] (Graph no. 10).



Amidst the growing numbers of confirmed cases, the fatalities increased at a tremendous pace. According to COVID-19 global forecasting week, United Kingdom stands on top with a total of thirty-four million (34.078k) deaths. The second most fatalities occur in Italy, including a total of three million and 31.61k in numbers. France and Spain reached the third-highest number of deaths, with a total of twenty-seven million (27.532k) and twenty-seven million (27.459k). This data was also last updated on May 15, 2020 [10]. Europe is mobilizing all resources to support member states to coordinate their national responses. Providing objective information about the spread of the virus, the active efforts to contain it, and steps used to improve the economic and social damage produced by the pandemic [15].

## What do we know about transmission, incubation, and environmental stability?

Asymptomatic carriers are the most common source of transmission. We observed that several studies recommended

serology analysis to diagnose COVID-19. Asymptomatic infections discovered among people in Wuhan China were used to design adequate public health measures. We found that clinical data got collected and analyzed in the Wuhan General Hospital mandatory for 16 to 64-year-old asymptomatic people. It is a retrospective study that estimates seroprevalence of IgM and IgG. In this study, these seroprevalences analyzed the epidemiological characteristics of the asymptomatic SARS-COV-2 infected population. From the Wuhan General Hospital between March 26 and April 28, 2020, many demographic and radiologic data were collected for this study [16]. This information is taken from the article given

pub_date	authors	title	excerpt
2020-06-19	Ling, et al.	Seroprevalence and epidemiological characteristics of immunoglobulin M and G antibodies against SARS-CoV-2 in asymptomatic people in Wuhan, China	Based on the census population aged 16-64 years in wuhan in 2017, we estimated that 172,340 (95% ci: 157,568-187,112) asymptomatic people aged 16-64 years were infected with sars-cov-2 in wuhan between march 25 and april 28, 2020.

Other ways of transmission include droplets transmission through mouth and nose, contact spread through table, chairs, and handles, aerosol transmission, i.e, air, fecal-oral route transmission, and mother-to-child transmission. All these sources of communication require social interaction, and thus, isolating oneself is one of the ways to be safe from the virus. All the information about transmission has been taken from the notebook available on Kaggle [17].

Once the virus is transmitted, then comes a period of incubation. Evaluating the severity of the infection is estimated by the specified reproduction number (denoted R 0). In a population, the average number of cases is generated by an infected individual where everyone is susceptible to infection, which is defined by the reproduction number. We discovered that many studies estimated the first reproduction number to be 3.15 with the 95% CI (2.41-3.90), the average incubation time to be 5.08 days with the 95% CI (4.77-5.39) (in a day), the asymptomatic infection rate to be 46% with the 95% CI (18.48%-73.60%), and the case fatality rate to be 2.72% with 95% CI (1.29%-4.16%). Here having no infections or symptoms account for estimation of the required reproduction number, mean incubation time, asymptomatic infection rate, and the case fatality rate for COVID-19: meta-analysis and sensitivity analysis [18]. The information has been taken from the given article available on Kaggle.

pub_date	authors	title	excerpt
2020-06-09	He, et al.	Estimation of the basic reproduction number, average incubation time, asymptomatic infection rate, and case fatality rate for COVID-19: Meta-analysis and sensitivity analysis	This manuscript conducts a meta-analysis and a sensitivity study to answer the questions: what is the basic reproduction number? how long is the incubation time of the disease on average? what portion of infections are asymptomatic? and ultimately, what is the case fatality rate? our studies estimate the basic reproduction number to be 3.15 with the 95% ci (2.41-3.90), the average incubation time to be 5.08 days with the 95% ci (4.77-5.39) (in day), the asymptomatic infection rate to be 46% with the 95% ci (18.48%-73.60%), and the case fatality rate to be 2.72% with 95% ci (1.29%-4.16%) where asymptomatic infections are accounted for. estimation of the basic reproduction number, average incubation time, asymptomatic infection rate, and case fatality rate for covid-19: meta-analysis and sensitivity analysis.

Transmission for COVID-19 is mainly through close contact and respiratory droplets. The fecal-oral transmission has not been ruled out yet. It is crucial to find how acidic stomach fluid affects the infectivity of this virus. Under the dry or wet conditions, the stability of the COVID-19 virus is still not well understood. Shown in a present study about the infectivity, which is exceptional as manifested by Vero-E6 cell infection, which is caused by the Plaque Forming Unit (PFU) of the virus. The stability is further investigated in wet, dry, and acidic with a P.H. of 2.2 environments. The results for the dry condition are less favorable for the virus to survive. However, the COVID-19 virus could survive for three days in damp and dry climates. Further studies can be found in a given article [19]. Further studies can be found in a given section.

pub_date	authors	title	excerpt
2020-04-14	Sun, et al.	Stability of the COVID-19 virus under wet, dry and acidic conditions	Results showed that the covid-19 virus could survive for three days in wet and dry environments, but the dry condition is less favorable for the survival of the virus.

The persistence of this virus detected on inanimate surfaces varied from minutes to up to one month, depending on the environmental condition. In closed unventilated buses, the COVID-19 infection survives for at least 30 minutes without losing its infectivity. The most common coronaviruses may well survive or persist on surfaces for up to one month. Viruses in respiratory or fecal specimens can maintain infectivity for quite a long time at room temperature. The infected patient remains in the ward; the virus exists in the air due to respiratory droplets. The half-life of coronaviruses in aerosols was reported to be eight hours at 80% humidity in the environment [20]. Further data can be found in the following article available on the Kaggle link [17].

pub_date	authors	title	excerpt
2020-04-26	Ren, et al.	Stability and infectivity of coronaviruses in inanimate environments	This review aims to summarize data on the persistence of different coronaviruses on inanimate surfaces.  All reports with experimental evidence on the duration persistence of coronaviruses on any type of surface were included.  Most viruses from the respiratory tract, such as coronaviruses, influenza, sars-cov, or rhinovirus, can persist on surfaces for a few days.  Persistence time on inanimate surfaces varied from minutes to up to one month, depending on the environmental conditions.  The most common coronaviruses may well survive or persist on surfaces for up to one month.

### What is known about COVID-19 risk factors?

A risk factor doubles the likelihood of being infected or influences the severity or the survival outcome of the infection. There are various risk factors associated with COVID-19. One of the risk factors is having heart risk and diseases. COVID-19 severity is more likely to worsen if the patient also has chronic diseases like coronary heart disease, hypertension, and diabetes [21].

heart risks	Effects of hypertension, diabetes and coronary heart disease on COVID-19 diseases severity: a systematic review and meta-analysis	[heart disease]	11	[https://doi.org/10.1101/2020.03.25.20043137]
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Further data can be read from the articles available on it. Studies have found that people with older age (60 or above) are at higher-risk for COVID-19. The following report indicates the fatality ratio across the spectrum of COVID-19 disease, and there is a strong correlation with age being of the risk factor in the death [22].

Humidity is an added risk factor associated with COVID-19. The respiratory droplets are the main route of transmission of COVID-19

Old Age	Estimates of the severity of coronavirus disease 2019: a model-based analysis	7	with substantially higher ratios in older age groups (0.32% [0.27-0.38] in those aged <65 years vs 6.4% [6.7-7.3] in those aged ≥65 years	<a href="https://doi.org/10.1016/j.lan.2020.03.043">https://doi.org/10.1016/j.lan.2020.03.043</a>
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infection. However, through other body fluids and excreta, this virus is also detected. At different temperatures and smooth surfaces were studied to find the stability factor for COVID-19. The dried virus found on the flat surface retains its viability for greater than 5 days when the temperature is around 22-25°C. Also, the humidity of 40-50%, typical air-conditioned environments, plays a role in the stability of COVID-19 [23].

humidity	Effect modification of environmental factors on influenza-associated mortality: a time-series study in two Chinese cities	[humidity]	24	<a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3205445/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3205445/</a>
humidity	The Effects of Temperature and Relative Humidity on the Viability of the SARS Coronavirus	[humidity]	20	<a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3205313/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3205313/</a>
humidity	Effect of temperature and relative humidity on ultraviolet (UV254) inactivation of airborne porcine respiratory and reproductive syndrome virus	[humidity]	17	<a href="https://doi.org/10.1016/j.letme.2012.03.044">https://doi.org/10.1016/j.letme.2012.03.044</a>

Air pollution also presents a vital impact when someone is infected with COVID-19. Most data originate from temperate regions. The studies demonstrated a positive association between air pollution and virus case fatality in the Chinese population by utilizing publicly accessible data on SARS statistics and air pollution indices. Air pollution has wide-ranging systemic effects on the human body, impacting both the respiratory and cardiovascular systems via multiple mechanisms, including oxidative stress, inflammation, and endothelial dysfunction [24].

pollution	Comparison of the Effects of Air Pollution on Outpatient and Inpatient Visits for Asthma: A Population-Based Study in Taiwan	[air pollution and, 'air pollution is', 'between air pollution', 'of air pollution']	4	<a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4209842/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4209842/</a>
pollution	Particulate air pollution on cardiovascular mortality in the tropics: impact on the elderly	[of air pollution', 'particulate air pollution', 'air pollutant data']	4	<a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3417521/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3417521/</a>

We found that environments such as seasonal climates strongly impacted spatiotemporal patterns of an infectious disease outbreak. However, the relationship between COVID-19 dynamic and atmosphere remains controversial. The temperature has an essential effect on viral activity, particularly in the case of enveloped viruses. Most reports on viral seasonality concentrate on infections that appear in the winter months. Studies have found that COVID-19 was significantly lower in warm climate countries and has high-risk factors in cold regions. There is a strict lockdown in countries with a cold climate [25].

temperature	Climate effect on COVID-19 spread rate: an online surveillance tool	[climate]	38	<a href="https://doi.org/10.1101/2020.03.28.20044727">https://doi.org/10.1101/2020.03.28.20044727</a>
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Population density also takes part in the COVID-19 risk factor. Density is likely just one of several key factors that determine how vulnerable places are to the virus.

Density probably leads to an increase in the contact rate of an individual, making the reproduction number larger and leading to more massive infectious disease outbreaks in dense areas. The following studies show the involvement of population density in various pandemics. Geographic variables play an essential role in the study of epidemics. The population density, in the spread of influenza is controversial. Many prior studies have tested for using arbitrary thresholds for population density above or below. These thresholds are hypothesized to have higher or lower mortality. The results of such studies are mixed. This study's objective is to estimate, rather than assume, a threshold level of population density that separates low-density regions from high-density regions based on population loss during an influenza pandemic [26].

### What is known about virus genetics, origin, and evolution?

The following data about virus genetics, origin, and evolution is taken from the notebook available on Kaggle. The link is given as <https://www.kaggle.com/jahangirs/covid-19-results>

population density	Rhinitis, Asthma and Respiratory Infections among Adults in Relation to the Home Environment in Multi-Family Buildings in Sweden	[densely populated', 'populated areas']	7	<a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4138153/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4138153/</a>
population density	Ascertaining the impact of public rapid transit system on spread of dengue in urban settings	[densely populated', 'populated areas']	5	<a href="https://doi.org/10.1016/j.sbsbs.2017.04.007">https://doi.org/10.1016/j.sbsbs.2017.04.007</a>
population density	A geographic analysis of population density thresholds in the influenza pandemic of 1918-19	[population densities', 'densely populated']	3	<a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC364195/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC364195/</a>
population density	Association of H5A class I with severe acute respiratory syndrome coronavirus infection	[densely populated', 'populated regions']	2	<a href="https://www.ncbi.nlm.nih.gov/pmc/articles/PMC212558/">https://www.ncbi.nlm.nih.gov/pmc/articles/PMC212558/</a>

Viruses evolve by mutating. There are changes in their genetic code over time. Some viruses transmit from wildlife to humans or domestic animals. The COVID-19 virus is a new type of bat coronavirus. It is genetically reasonably distant from the human SARS coronavirus. When performed the structure analysis, we discovered the Spike (S) the protein of this new virus showed that the S protein only binds weakly to the ACE2 receptor on human cells. The human SARS coronavirus actively exhibits an affinity to the ACE receptor. We discovered that these findings suggest a new virus does not transmit between humans and theoretically not able to cause serious human infections. This shows that the virus can easily be transmitted through animals. Further information can be read from the article available on the given link [27].

**Task 3: What do we know about virus genetics, origin, and evolution?**

1. can animals transmit 2019-ncov?

Red foxes (*Vulpes vulpes*) are the most widespread members of the order Carnivora. Since they often live in (peri)urban areas, they are a potential reservoir of viruses that transmit from wildlife to humans or domestic animals. Here we evaluated the fecal viral microbiome of 13 red foxes by random PCR in combination with next-generation sequencing. Various novel viruses, including a parvovirus, bocavirus, adeno-associated virus, hepevirus, astroviruses, and picobirnaviruses, were identified.

The emergence of COVID-19 reminds us once again of the importance of establishing a systematic coronavirus surveillance network. The prevention and control department facing new challenges in controlling the epidemic and providing rapid response to scientific research.

The Human Coronavirus (HCOV) contains HCOV-229E, HCOV-NL63, HCOV-OC43, HCOV-HKU1, SARS-COV, and MERS-COV. HCOV-229E, HCOV-NL63, HCOV-OC43, and HCOV-HKU1, pathogens of the common cold. During 2002-2003, a new coronavirus, the SARS-COV, caused an acute, severe, frequently fatal respiratory disease with prominent systemic symptoms. The outbreak originated in southern China, probably the following transmission from an animal in animal markets or bats to humans. The first occurrence of coronavirus disease 2019, some online tools have become available to assist with tracking Covid-19 prevalence. Agencies, such as public health, provide real-time infection tracking tools that report country-specific COVID-19 incidence metrics and prevalence data. Further data regarding mechanisms are available on a given link and article [27].

3. what real-time genomic tracking tools exist?

Mass spectrometry (MS) has found numerous applications in life sciences. It has high accuracy, sensitivity and wide dynamic range in addition to medium- to high-throughput capabilities. These features make MS a superior platform for analysis of various biomolecules including proteins, lipids, nucleic acids and carbohydrates. Until recently, MS was applied for protein detection and characterization. During the last decade, however, MS has successfully been used for molecular diagnostics of microbial and viral infections with the most notable applications being identification of pathogens, genomic sequencing, mutation detection, DNA methylation analysis, tracking of transmissions, and characterization of genetic heterogeneity. These new developments vastly expand the MS application from experimental research to public health and clinical fields. Matching of molecular techniques with specific requirements of the major MS platforms has produced powerful technologies for molecular diagnostics, which will further benefit from coupling with computational tools for extracting clinical information from MS-derived data.

In 2002-2003, a novel pathogen severe acute respiratory syndrome, SARS, as an epidemic emerged. Future outbreaks prevention is essential and requires understanding the pathogenesis and development of the virus. The presence of SARS-COV was determined by RT-PCR and confirmed by electron microscopy. The virus was isolated, followed by the determination of its genome sequences, which were then analyzed by comparing it with other 46 SARS-COV genomes. As the infection of 2019-nCoV Coronavirus is quickly

developing into a global pneumonia epidemic, the careful analysis of its transmission and cellular mechanisms is sorely needed. [27].

To prevent future outbreak, various measures have been taken. In developing countries of Asia, there is continuous and close contact between animals and humans, especially in rural settings. Many healthcare systems faced challenges. They are compelled both national and international levels to have a better framework for preparedness, outbreak response, and recovery. To have a better framework, a thorough review done by the World Health Organization, Center for Disease Control and Prevention, and the Malaysian framework. These reviews were done to identify specific components and replicable objectives to the national context [27]. Further measures and actions can be read from the given article available on Kaggle [27].

#### 5. what efforts are being done in asia to prevent further outbreaks?

Diseases transmitted from animals have assumed substantial public health importance. Avian influenza, severe acute respiratory syndrome, and Nipah virus infection are a few examples of growing number of diseases that humans can contract from animals. These diseases can cause huge economic losses in addition to mortality and morbidity. In developing countries of Asia, there is a continuous and close contact between animals and humans, especially in rural settings. The prevailing sociocultural practices and weak public health infrastructure further enhances the vulnerability of Asia as the epicenter of outbreaks due to zoonotic infections. There is a clear need of greater awareness and application of a multisectoral and multidisciplinary approach to prevent and control zoonotic infections.

### What do we know about vaccines & therapeutics?

No effective therapy for COVID-19 is available currently. Here we discuss the drugs that have been investigated for the treatment of the disease. All the listed therapies are at experimental at this stage. However, due to the severe healthcare effects of the Pandemic and the potentially fatal outcome of COVID-19 patients treated in intensive care units, their off-label use should be considered. Further information about the drugs being used to manage the virus can be known from the notebook available on Kaggle [27]. The link is given as <https://www.kaggle.com/jahangirs/covid-19-results>

#### Task 4: What do we know about vaccines and therapeutics?

##### 1. what drugs or therapies are being investigated?

There is currently no proven effective therapy for COVID-19. Here we discuss the drugs most investigated for the treatment of the disease. All the listed therapies are experimental at this stage. However, due to the severe healthcare effects of the pandemic and the potentially fatal outcome of COVID-19 patients treated in the intensive care units, their off-label use should none-the-less be considered. *Orv Hettl. 2020; 161(17): 685698.*

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The emerging coronavirus disease (COVID-19) swept across the world, affecting more than 200 countries and territories. Genomic analysis suggests that the COVID-19 virus originated in bats and transmitted to humans through unknown intermediate hosts in the Wuhan seafood market, China, in December of 2019. This virus belongs to the Betacoronavirus group, the same group of the 2003 severe acute respiratory syndrome coronavirus (SARS-CoV), and for the similarity, it was named SARS-CoV-2. Given the lack of registered clinical therapies or vaccines, many physicians and scientists are investigating previously used clinical drugs for COVID-19 treatment. In this review, we aim to provide an overview of the CoV's origin, pathogenicity, and genomic structure, with a focus on SARS-CoV-2. Besides, we summarize the recently investigated drugs that constitute an option for COVID-19 treatment.

The treatment for COVID-19 is being investigated, including the use of antivirals and different therapies, targeting several complications from COVID-19. Mild fever, cough, dyspnea, and some complications such as Acute Respiratory Distress Syndrome (ARDS), systemic hyper inflammation, and sepsis. Understanding pathogenesis and complexity are essential in developing effective therapies to treat potentially life-threatening diseases [27].

Targeting RNA respiratory viruses, many drugs result in few effective therapies. Many antiviral highlights the challenge of treating COVID-19. Unfortunately, few accurate data support these antivirals, which targeting symptomatic COVID-19 [27].

Rodents host many segmented genome RNA viruses, arena viruses, and hantaviruses. These viruses can infect humans via direct or indirect transmission routes, which has to lead to human morbidity and mortality. Despite this emerging importance of these pathogens, currently, no effective antiviral drugs except Ribavirin proved effective against Lassa Virus [27].

There is an active global health threat by the Coronavirus disease 2019 (SARS-CoV2), for which treatment is being explored. Most people infected with mild to moderate symptoms, and they do recover with supportive care, and many do manifest severe clinical signs [27].

Few effective therapies, targeting RNA respiratory virus have resulted which highlight challenges for antiviruses to treat COVID-19. These antiviral treatments under investigation for symptomatic COVID-19 but unable to find definitive data to support their clinical use. However, Remdesivir, in vitro with good activity found against SARS-CoV2, results in favorable outcomes mostly for hospitalized patients. Remdesivir, in a compassionate use series, has shortened the time of recovery and helped decrease the mortality of severely compromised patients. Currently, in phase III clinical trials, Remdesivir under compassionate use and through Emergency Use Authorization (EUA) [27].

Mast-Cell stabilizers, Nedocromil prevents or ablates the acute and late phase of allergic response. Nedocromil is not a steroid but an inflammatory agent for pulmonary administration. Its nasal form is under clinical trials and not yet released in the United States [27].

### What do we know about non-pharmaceutical interventions?

Some non-pharmaceutical interventions have been discovered due to Covid-19. Social distancing and lockdown protocols have taken place around the globe. Non-pharmaceutical, estimated to reduce transmission by a maximum of 34% without resorting to a strict lockdown strategy. To optimize epidemic control, continuous efforts to monitor the transmissibility are needed [27]. The data has been taken from a notebook available on Kaggle. The link is given as <https://www.kaggle.com/jahangirs/covid-19-results>

#### Task 5: What do we know about non-pharmaceutical interventions?

##### 1. which non-pharmaceutical interventions limit transmission?

As rates of new COVID-19 cases decline across Europe due to non-pharmaceutical interventions such as social distancing policies and lockdown measures, countries require guidance on how to ease restrictions while minimizing the risk of resurgent outbreaks. Here, we use mobility and case data to quantify how coordinated exit strategies could delay continental resurgence and limit community transmission of COVID-19. We find that a resurgent continental epidemic could occur as many as 5 weeks earlier when well-connected countries with stringent existing interventions and their interventions prematurely. Further, we found that appropriate coordination can greatly improve the likelihood of eliminating community transmission throughout Europe. In particular, synchronizing intermittent lockdowns across Europe meant half as many lockdown periods were required to end community transmission continent-wide.

We analyzed transmission of coronavirus disease outside of the Daegu-Gyeongsangbuk provincial region in South Korea. We estimated that nonpharmaceutical measures reduced transmissibility by a maximum of 34% without resorting to a strict lockdown strategy. To optimize epidemic control, continuous efforts to monitor the transmissibility are needed.

We analyzed transmission of coronavirus disease outside of the Daegu-Gyeongsangbuk provincial region in South Korea. We estimated that nonpharmaceutical measures reduced transmissibility by a maximum of 34% without resorting to a strict lockdown strategy. To optimize epidemic control, continuous efforts to monitor the transmissibility are needed.

It is particularly noteworthy with a growing HIV/AIDS epidemic for the health service providers in China to recognize and correctly adhere to universal precautions. Many of China's healthcare system workers, utilizing qualitative interview data and perspective from health administrators and service providers, were also examined [27]. A continuous effort is required to monitor the transmissibility and to control this epidemic [27].

Great efforts by hospital authorities and hospital clusters, were studied to contain and prevent infection. To prevent the outbreak of SARS and other droplet infection, a high level of vigilance was enforced. To follow hospital infection control and isolation precautions, most of the health workers recognized and followed hospital infection control and isolation precautions. When compared with previous studies, compliance with infection control guideline were detected. Most participants had positive perceptions of the instructions and found the training program useful. This study identified many

infection controls practices that require improving the clarity of guidelines in the field of infection and prevention control [27].

In East Asia, substantial compliance practice for infection control has not been documented. To investigate changes under recommended infection control practices over eleven years and to identify affecting factors, two nationwide cross-sectional surveys of dentists in Taiwan were conducted in 1999 and 2010 [27]. Although infection control practices have improved over time, there is room for improvement in practices such as wearing a head cap, protective eyewear, and a face mask and disinfecting impression materials. Implementing accurate measures about disinfection and sterilization methods strengthen the ability to fight from viruses [27].

## Conclusion

The COVID-19 cases keep increasing daily around the globe, along with death rates as well. All primary information about COVID-19 with actual data sets is achieved in this research. We have come to know the authentic number of total cases with deaths and fatalities in various areas around the globe. The sources from which all information taken are available on Kaggle, and these data set are correctly studied. In summary, the coronavirus history and evolution are studied. In this paper, links for further articles to understand this virus is provided. Various studies and analyses holding to cure this virus of scratch are provided in this manuscript.

Although some populations have recovered from the Pandemic in some parts of the world; we need some time for the virus to be eradicated. The economy will also take time to recover. Several small businesses will try harder than usual to take their place back. It is anticipated that, the people will have to live with this virus as a new normal forever because it still doesn't know when the virus will be demolished from the world until its vaccine shows up.

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