



COVID-19 in World Research Literatures

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Abstract: Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The virus is mainly spread during close contact and via respiratory droplets that are produced when a person talks, coughs, or sneezes. Respiratory droplets may be produced during breathing, however, current research indicates that the virus is not considered airborne. People may also contract COVID-19 by touching a contaminated surface (Fomite) and then inadvertently transfer the pathogen to a mucous membrane (such as the eyes, nose, or mouth). It is most contagious when people are symptomatic, although spread may be possible before symptoms appear. The virus can live on surfaces up to 72 hours. Time from exposure to onset of symptoms is generally between two and fourteen days, with an average of five days. The standard method of diagnosis is by reverse transcription polymerase chain reaction (rRT-PCR) from a nasopharyngeal swab. The infection can also be diagnosed from a combination of symptoms, risk factors and a chest CT scan showing features of pneumonia. This article introduces recent research reports as references in the related studies.

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Key words: COVID-19; World; life; research; literature

Introduction

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The virus is mainly spread during close contact and via respiratory droplets that are produced when a person talks, coughs, or sneezes. Respiratory droplets may be produced during breathing, however, current research indicates that the virus is not considered airborne. People may also contract COVID-19 by touching a contaminated surface (Fomite) and then inadvertently transfer the pathogen to a mucous membrane (such as the eyes, nose, or mouth). It is most contagious when people are symptomatic, although spread may be possible before symptoms appear. The virus can live on surfaces up to 72 hours. Time from exposure to onset of symptoms is generally between two and fourteen days, with an average of five days. The standard method of diagnosis is by reverse transcription polymerase chain reaction (rRT-PCR) from a nasopharyngeal swab. The infection can also be diagnosed from a combination of symptoms, risk factors and a chest CT scan showing features of pneumonia. This article introduces recent research reports as references in the related studies.

The following introduces recent reports as references in the related studies.

Adhikari, S. P., et al. (2020). "Epidemiology, causes, clinical manifestation and diagnosis, prevention and control of coronavirus disease (COVID-19) during the early outbreak period: a scoping review." *Infect Dis Poverty* 9(1): 29.

BACKGROUND: The coronavirus disease (COVID-19) has been identified as the cause of an outbreak of respiratory illness in Wuhan, Hubei Province, China beginning in December 2019. As of 31 January 2020, this epidemic had spread to 19 countries with 11 791 confirmed cases, including 213 deaths. The World Health Organization has declared it a Public Health Emergency of International Concern. **METHODS:** A scoping review was conducted following the methodological framework suggested by Arksey and O'Malley. In this scoping review, 65 research articles published before 31 January 2020 were analyzed and discussed to better understand the epidemiology, causes, clinical diagnosis, prevention and control of this virus. The research domains, dates of publication, journal language, authors' affiliations, and methodological characteristics were included in the analysis. All the findings and statements in this review regarding the outbreak are based on published information as listed in the references. **RESULTS:** Most of the publications were written using the English language (89.2%). The largest proportion of published articles were related to causes (38.5%) and a majority (67.7%) were published by Chinese scholars.

Research articles initially focused on causes, but over time there was an increase of the articles related to prevention and control. Studies thus far have shown that the virus' origination is in connection to a seafood market in Wuhan, but specific animal associations have not been confirmed. Reported symptoms include fever, cough, fatigue, pneumonia, headache, diarrhea, hemoptysis, and dyspnea. Preventive measures such as masks, hand hygiene practices, avoidance of public contact, case detection, contact tracing, and quarantines have been discussed as ways to reduce transmission. To date, no specific antiviral treatment has proven effective; hence, infected people primarily rely on symptomatic treatment and supportive care. CONCLUSIONS: There has been a rapid surge in research in response to the outbreak of COVID-19. During this early period, published research primarily explored the epidemiology, causes, clinical manifestation and diagnosis, as well as prevention and control of the novel coronavirus. Although these studies are relevant to control the current public emergency, more high-quality research is needed to provide valid and reliable ways to manage this kind of public health emergency in both the short- and long-term.

Agarwal, A., et al. (2020). "Guidance for building a dedicated health facility to contain the spread of the 2019 novel coronavirus outbreak." Indian J Med Res.

Preparedness for the ongoing coronavirus disease 2019 (COVID-19) and its spread in India calls for setting up of adequately equipped and dedicated health facilities to manage sick patients while protecting healthcare workers and the environment. In the wake of other emerging dangerous pathogens in recent times, such as Ebola, Nipah and Zika, it is important that such facilities are kept ready during the inter-epidemic period for training of health professionals and for managing cases of multi-drug resistant and difficult-to-treat pathogens. While endemic potential of such critically ill patients is not yet known, the health system should have surge capacity for such critical care units and preferably each tertiary government hospital should have at least one such facility. This article describes elements of design of such unit (e.g., space, infection control, waste disposal, safety of healthcare workers, partners to be involved in design and plan) which can be adapted to the context of either a new construction or makeshift construction on top of an existing structure. In view of a potential epidemic of COVID-19, specific requirements to handle it are also given.

Al-Mandhari, A., et al. (2020). "Coronavirus Disease 2019 outbreak: preparedness and readiness of

countries in the Eastern Mediterranean Region." East Mediterr Health J **26**(2): 136-137.

On 31 December 2019, a cluster of acute respiratory illness was reported from China and later confirmed as novel coronavirus on 7 January 2020. This virus is the same member of the coronavirus family that caused the severe acute respiratory syndrome (SARS-CoV) reported in China 2003, and Middle East respiratory syndrome (MERS-CoV) reported in Saudi Arabia in 2012. The initial cases have been linked to a live seafood market in Wuhan, China, and the specific animal source is yet to be determined. The detection of this new virus in humans without knowing the source of the infection has raised greatly heightened concerns not only in China, but also internationally. To date, the outbreak has spread to most provinces in China and 25 other countries within a relatively short period. Consequent to its spread, Dr Tedros Ghebreyesus, Director General of the World Health Organization (WHO), declared the outbreak a Public Health Emergency of International Concern (PHEIC) on 30 January 2020.

Al-Qaness, M. A. A., et al. (2020). "Optimization Method for Forecasting Confirmed Cases of COVID-19 in China." J Clin Med **9**(3).

In December 2019, a novel coronavirus, called COVID-19, was discovered in Wuhan, China, and has spread to different cities in China as well as to 24 other countries. The number of confirmed cases is increasing daily and reached 34,598 on 8 February 2020. In the current study, we present a new forecasting model to estimate and forecast the number of confirmed cases of COVID-19 in the upcoming ten days based on the previously confirmed cases recorded in China. The proposed model is an improved adaptive neuro-fuzzy inference system (ANFIS) using an enhanced flower pollination algorithm (FPA) by using the salp swarm algorithm (SSA). In general, SSA is employed to improve FPA to avoid its drawbacks (i.e., getting trapped at the local optima). The main idea of the proposed model, called FPASSA-ANFIS, is to improve the performance of ANFIS by determining the parameters of ANFIS using FPASSA. The FPASSA-ANFIS model is evaluated using the World Health Organization (WHO) official data of the outbreak of the COVID-19 to forecast the confirmed cases of the upcoming ten days. More so, the FPASSA-ANFIS model is compared to several existing models, and it showed better performance in terms of Mean Absolute Percentage Error (MAPE), Root Mean Squared Relative Error (RMSRE), Root Mean Squared Relative Error (RMSRE), coefficient of determination (R^2), and computing time. Furthermore, we tested the proposed model using two different datasets of weekly influenza confirmed cases

in two countries, namely the USA and China. The outcomes also showed good performances.

Andrea, G., et al. (2020). "Coronavirus Disease 2019 and Transplantation: a view from the inside." Am J Transplant.

Since December 2019, world healthcare community faced with Coronavirus Disease 2019 (COVID-19) outbreak caused by SARS-CoV-2. Due to the high viral contagiousness and the possible transmission during the pre-symptomatic phase, COVID-19 progressively spread to several countries. Currently, Italy is the third Country for number of confirmed cases after mainland China and South Korea, and the first western nation with a well-established deceased transplant program to tackle a COVID-19 outbreak (1).

Arshad Ali, S., et al. (2020). "The outbreak of Coronavirus Disease 2019 (COVID-19)-An emerging global health threat." J Infect Public Health.

The outbreak of Coronavirus Disease 2019 (COVID-19) causing novel coronavirus-infected pneumonia (NCIP), has affected the lives of 71,429 people globally. Originating in China, the disease has a rapid progression to other countries. Research suggests remarkable genomic resemblance of 2019-nCoV with Severe Acute Respiratory Syndrome (SARS) which has a history of a pandemic in 2002. With evidence of nosocomial spread, a number of diligent measures are being employed to constrain its propagation. Hence, the Public Health Emergency of International Concern (PHEIC) has been established by the World Health Organization (WHO) with strategic objectives for public health to curtail its impact on global health and economy.

Ashour, H. M., et al. (2020). "Insights into the Recent 2019 Novel Coronavirus (SARS-CoV-2) in Light of Past Human Coronavirus Outbreaks." Pathogens **9**(3).

Coronaviruses (CoVs) are RNA viruses that have become a major public health concern since the Severe Acute Respiratory Syndrome-CoV (SARS-CoV) outbreak in 2002. The continuous evolution of coronaviruses was further highlighted with the emergence of the Middle East Respiratory Syndrome-CoV (MERS-CoV) outbreak in 2012. Currently, the world is concerned about the 2019 novel CoV (SARS-CoV-2) that was initially identified in the city of Wuhan, China in December 2019. Patients presented with severe viral pneumonia and respiratory illness. The number of cases has been mounting since then. As of late February 2020, tens of thousands of cases and several thousand deaths have been reported in China alone, in addition to thousands of cases in other

countries. Although the fatality rate of SARS-CoV-2 is currently lower than SARS-CoV, the virus seems to be highly contagious based on the number of infected cases to date. In this review, we discuss structure, genome organization, entry of CoVs into target cells, and provide insights into past and present outbreaks. The future of human CoV outbreaks will not only depend on how the viruses will evolve, but will also depend on how we develop efficient prevention and treatment strategies to deal with this continuous threat.

Baig, A. M., et al. (2020). "Evidence of the COVID-19 Virus Targeting the CNS: Tissue Distribution, Host-Virus Interaction, and Proposed Neurotropic Mechanisms." ACS Chem Neurosci.

The recent outbreak of coronavirus infectious disease 2019 (COVID-19) has gripped the world with apprehension and has evoked a scare of epic proportion regarding its potential to spread and infect humans worldwide. As we are in the midst of an ongoing pandemic of COVID-19, scientists are struggling to understand how it resembles and differs from the severe acute respiratory syndrome coronavirus (SARS-CoV) at the genomic and transcriptomic level. In a short time following the outbreak, it has been shown that, similar to SARS-CoV, COVID-19 virus exploits the angiotensin-converting enzyme 2 (ACE2) receptor to gain entry inside the cells. This finding raises the curiosity of investigating the expression of ACE2 in neurological tissue and determining the possible contribution of neurological tissue damage to the morbidity and mortality caused by COVID-19. Here, we investigate the density of the expression levels of ACE2 in the CNS, the host-virus interaction and relate it to the pathogenesis and complications seen in the recent cases resulting from the COVID-19 outbreak. Also, we debate the need for a model for staging COVID-19 based on neurological tissue involvement.

Bwire, G. M. and L. S. Paulo (2020). "Coronavirus disease-2019: is fever an adequate screening for the returning travelers?" Trop Med Health **48**: 14.

On Thursday, 30 January 2020, World Health Organization declared Coronavirus disease-2019 (COVID-2019) a Public Health Emergency of International Concern. Since its identification in late December 2019 in Wuhan, Hubei Province, People's Republic of China, the number of cases imported into other countries is increasing, and the epidemiological map is changing rapidly. On the other hand, body temperature screening (fever) is the major test performed at points of entry, i.e., airports, in the returning travelers in most of the countries with limited resources. However, the recent report on

asymptomatic contact transmission of COVID-19 and travelers who passed the symptoms-based screening and tested positive for COVID-19 using reverse transcription polymerase chain reaction (RT-PCR) challenges this approach as body temperature screening may miss travelers incubating the disease or travelers concealing fever during travel. On this note, travel restrictions to and from high risk areas and/or 14 days quarantine of travelers coming from high risk areas are recommended to prevent possible importation of COVID-19. Currently, RT-PCR is a reliable test in detecting both symptomatic and asymptomatic COVID-19.

Calvo, C., et al. (2020). "[Recommendations on the clinical management of the COVID-19 infection by the <<new coronavirus>> SARS-CoV2. Spanish Paediatric Association working group]." An Pediatr (Barc).

On 31 December 2019, the Wuhan Municipal Committee of Health and Healthcare (Hubei Province, China) reported that there were 27 cases of pneumonia of unknown origin with symptoms starting on the 8 December. There were 7 serious cases with common exposure in market with shellfish, fish, and live animals, in the city of Wuhan. On 7 January 2020, the Chinese authorities identified that the agent causing the outbreak was a new type of virus of the Coronaviridae family, temporarily called <<new coronavirus>>, 2019-nCoV. On January 30th, 2020, the World Health Organisation (WHO) declared the outbreak an International Emergency. On 11 February 2020 the WHO assigned it the name of SARS-CoV2 and COVID-19 (SARS-CoV2 and COVID-19). The Ministry of Health summoned the Specialties Societies to prepare a clinical protocol for the management of COVID-19. The Spanish Paediatric Association appointed a Working Group of the Societies of Paediatric Infectious Diseases and Paediatric Intensive Care to prepare the present recommendations with the evidence available at the time of preparing them.

Cao, Y., et al. (2020). "Hospital Emergency Management Plan During the COVID-19 Epidemic." Acad Emerg Med.

The confirmed and suspected cases of the 2019 novel coronavirus disease (COVID-19) have increased not only in Wuhan, Hubei Province but also China and the world. Enormous demand for handling the COVID-19 outbreak challenged both the healthcare personnel and medical supply system. In West China Hospital, Emergency Department (ED) undertook the mission of clinical reception, primary diagnosis, and interim treatment for the suspected cases of COVID-19.

Casella, M., et al. (2020). Features, Evaluation and Treatment Coronavirus (COVID-19). StatPearls. Treasure Island (FL).

According to the World Health Organization (WHO), viral diseases continue to emerge and represent a serious issue to public health. In the last twenty years, several viral epidemics such as the severe acute respiratory syndrome coronavirus (SARS-CoV) in 2002 to 2003, and H1N1 influenza in 2009, have been recorded. Most recently, the Middle East respiratory syndrome coronavirus (MERS-CoV) was first identified in Saudi Arabia in 2012. In a timeline that reaches the present day, an epidemic of cases with unexplained low respiratory infections detected in Wuhan, the largest metropolitan area in China's Hubei province, was first reported to the WHO Country Office in China, on December 31, 2019. Published literature can trace the beginning of symptomatic individuals back to the beginning of December 2019. As they were unable to identify the causative agent, these first cases were classified as "pneumonia of unknown etiology." The Chinese Center for Disease Control and Prevention (CDC) and local CDCs organized an intensive outbreak investigation program. The etiology of this illness is now attributed to a novel virus belonging to the coronavirus (CoV) family. On February 11, 2020, the WHO Director-General, Dr. Tedros Adhanom Ghebreyesus, announced that the disease caused by this new CoV was a "COVID-19," which is the acronym of "coronavirus disease 2019". In the past twenty years, two additional coronavirus epidemics have occurred. SARS-CoV provoked a large-scale epidemic beginning in China and involving two dozen countries with approximately 8000 cases and 800 deaths, and the MERS-CoV that began in Saudi Arabia and has approximately 2,500 cases and 800 deaths and still causes as sporadic cases. This new virus seems to be very contagious and has quickly spread globally. In a meeting on January 30, 2020, per the International Health Regulations (IHR, 2005), the outbreak was declared by the WHO a Public Health Emergency of International Concern (PHEIC) as it had spread to 18 countries with four countries reporting human-to-human transmission. An additional landmark occurred on February 26, 2020, as the first case of the disease, not imported from China, was recorded in the United States. Initially, the new virus was called 2019-nCoV. Subsequently, the task of experts of the International Committee on Taxonomy of Viruses (ICTV) termed it the SARS-CoV-2 virus as it is very similar to the one that caused the SARS outbreak (SARS-CoVs). The CoVs have become the major pathogens of emerging respiratory disease outbreaks. They are a large family of single-stranded RNA viruses (+ssRNA) that can be isolated in different animal species. [1] For reasons yet to be

explained, these viruses can cross species barriers and can cause, in humans, illness ranging from the common cold to more severe diseases such as MERS and SARS. Interestingly, these latter viruses have probably originated from bats and then moving into other mammalian hosts - the Himalayan palm civet for SARS-CoV, and the dromedary camel for MERS-CoV - before jumping to humans. The dynamics of SARS-Cov-2 are currently unknown, but there is speculation that it also has an animal origin. The potential for these viruses to grow to become a pandemic worldwide seems to be a serious public health risk. Concerning COVID-19, the WHO raised the threat to the CoV epidemic to the "very high" level, on February 28, 2020. Probably, the effects of the epidemic caused by the new CoV has yet to emerge as the situation is quickly evolving. On March 11, as the number of COVID-19 cases outside China has increased 13 times and the number of countries involved has tripled with more than 118,000 cases in 114 countries and over 4,000 deaths, WHO declared the COVID-19 a pandemic. World governments are at work to establish countermeasures to stem possible devastating effects. Health organizations coordinate information flows and issues directives and guidelines to best mitigate the impact of the threat. At the same time, scientists around the world work tirelessly, and information about the transmission mechanisms, the clinical spectrum of disease, new diagnostics, and prevention and therapeutic strategies are rapidly developing. Many uncertainties remain with regard to both the virus-host interaction and the evolution of the epidemic, with specific reference to the times when the epidemic will reach its peak. At the moment, the therapeutic strategies to deal with the infection are only supportive, and prevention aimed at reducing transmission in the community is our best weapon. Aggressive isolation measures in China have led to a progressive reduction of cases in the last few days. In Italy, in geographic regions of the north, initially, and subsequently throughout the peninsula, political and health authorities are making incredible efforts to contain a shock wave that is severely testing the health system. In the midst of the crisis, the authors have chosen to use the "Statpearls" platform because, within the PubMed scenario, it represents a unique tool that may allow them to make updates in real-time. The aim, therefore, is to collect information and scientific evidence and to provide an overview of the topic that will be continuously updated.

Chan, J. F., et al. (2020). "Genomic characterization of the 2019 novel human-pathogenic coronavirus isolated from a patient with atypical pneumonia after visiting Wuhan." Emerg Microbes Infect **9**(1): 221-236.

A mysterious outbreak of atypical pneumonia in late 2019 was traced to a seafood wholesale market in Wuhan of China. Within a few weeks, a novel coronavirus tentatively named as 2019 novel coronavirus (2019-nCoV) was announced by the World Health Organization. We performed bioinformatics analysis on a virus genome from a patient with 2019-nCoV infection and compared it with other related coronavirus genomes. Overall, the genome of 2019-nCoV has 89% nucleotide identity with bat SARS-like-CoVZXC21 and 82% with that of human SARS-CoV. The phylogenetic trees of their orf1a/b, Spike, Envelope, Membrane and Nucleoprotein also clustered closely with those of the bat, civet and human SARS coronaviruses. However, the external subdomain of Spike's receptor binding domain of 2019-nCoV shares only 40% amino acid identity with other SARS-related coronaviruses. Remarkably, its orf3b encodes a completely novel short protein. Furthermore, its new orf8 likely encodes a secreted protein with an alpha-helix, following with a beta-sheet (s) containing six strands. Learning from the roles of civet in SARS and camel in MERS, hunting for the animal source of 2019-nCoV and its more ancestral virus would be important for understanding the origin and evolution of this novel lineage B betacoronavirus. These findings provide the basis for starting further studies on the pathogenesis, and optimizing the design of diagnostic, antiviral and vaccination strategies for this emerging infection.

Chan, J. F., et al. (2020). "Improved molecular diagnosis of COVID-19 by the novel, highly sensitive and specific COVID-19-RdRp/Hel real-time reverse transcription-polymerase chain reaction assay validated in vitro and with clinical specimens." J Clin Microbiol.

On 31(st) December 2019, the World Health Organization was informed of a cluster of cases of pneumonia of unknown etiology in Wuhan, China. Subsequent investigations identified a novel coronavirus, now named as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), from the affected patients. Highly sensitive and specific laboratory diagnostics are important for controlling the rapidly evolving SARS-CoV-2-associated Coronavirus Disease 2019 (COVID-19) epidemic. In this study, we developed and compared the performance of three novel real-time RT-PCR assays targeting the RNA-dependent RNA polymerase (RdRp)/helicase (Hel), spike (S), and nucleocapsid (N) genes of SARS-CoV-2 with that of the reported RdRp-P2 assay which is used in >30 European laboratories. Among the three novel assays, the COVID-19-RdRp/Hel assay had the lowest limit of detection in vitro (1.8 TCID₅₀/ml with genomic RNA and 11.2 RNA copies/reaction with in

vitro RNA transcripts). Among 273 specimens from 15 patients with laboratory-confirmed COVID-19 in Hong Kong, 77 (28.2%) were positive by both the COVID-19-RdRp/Hel and RdRp-P2 assays. The COVID-19-RdRp/Hel assay was positive for an additional 42 RdRp-P2-negative specimens [119/273 (43.6%) vs 77/273 (28.2%), $P < 0.001$], including 29/120 (24.2%) respiratory tract specimens and 13/153 (8.5%) non-respiratory tract specimens. The mean viral load of these specimens was 3.21×10^4 RNA copies/ml (range, 2.21×10^2 to 4.71×10^5 RNA copies/ml). The COVID-19-RdRp/Hel assay did not cross-react with other human-pathogenic coronaviruses and respiratory pathogens in cell culture and clinical specimens, whereas the RdRp-P2 assay cross-reacted with SARS-CoV in cell culture. The highly sensitive and specific COVID-19-RdRp/Hel assay may help to improve the laboratory diagnosis of COVID-19.

Chang, L., et al. (2020). "Coronavirus Disease 2019: Coronaviruses and Blood Safety." *Transfus Med Rev.*

With the outbreak of unknown pneumonia in Wuhan, China, in December 2019, a new coronavirus, Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), aroused the attention of the entire world. The current outbreak of infections with SARS-CoV-2 is termed Coronavirus Disease 2019 (COVID-19). The World Health Organization declared COVID-19 in China as a Public Health Emergency of International Concern. Two other coronavirus infections-SARS in 2002-2003 and Middle East Respiratory Syndrome (MERS) in 2012-both caused severe respiratory syndrome in humans. All 3 of these emerging infectious diseases leading to a global spread are caused by beta-coronaviruses. Although coronaviruses usually infect the upper or lower respiratory tract, viral shedding in plasma or serum is common. Therefore, there is still a theoretical risk of transmission of coronaviruses through the transfusion of labile blood products. Because more and more asymptomatic infections are being found among COVID-19 cases, considerations of blood safety and coronaviruses have arisen especially in endemic areas. In this review, we detail current evidence and understanding of the transmission of SARS-CoV, MERS-CoV, and SARS-CoV-2 through blood products as of February 10, 2020, and also discuss pathogen inactivation methods on coronaviruses.

Chen, J. (2020). "Pathogenicity and transmissibility of 2019-nCoV-A quick overview and comparison with other emerging viruses." *Microbes Infect* **22**(2): 69-71.

A zoonotic coronavirus, tentatively labeled as 2019-nCoV by the World Health Organization (WHO), has been identified as the causative agent of the viral pneumonia outbreak in Wuhan, China, at the end of 2019. Although 2019-nCoV can cause a severe respiratory illness like SARS and MERS, evidence from clinics suggested that 2019-nCoV is generally less pathogenic than SARS-CoV, and much less than MERS-CoV. The transmissibility of 2019-nCoV is still debated and needs to be further assessed. To avoid the 2019-nCoV outbreak turning into an epidemic or even a pandemic and to minimize the mortality rate, China activated emergency response procedures, but much remains to be learned about the features of the virus to refine the risk assessment and response. Here, the current knowledge in 2019-nCoV pathogenicity and transmissibility is summarized in comparison with several commonly known emerging viruses, and information urgently needed for a better control of the disease is highlighted.

Chen, L., et al. (2020). "RNA based mNGS approach identifies a novel human coronavirus from two individual pneumonia cases in 2019 Wuhan outbreak." *Emerg Microbes Infect* **9**(1): 313-319.

From December 2019, an outbreak of unusual pneumonia was reported in Wuhan with many cases linked to Huanan Seafood Market that sells seafood as well as live exotic animals. We investigated two patients who developed acute respiratory syndromes after independent contact history with this market. The two patients shared common clinical features including fever, cough, and multiple ground-glass opacities in the bilateral lung field with patchy infiltration. Here, we highlight the use of a low-input metagenomic next-generation sequencing (mNGS) approach on RNA extracted from bronchoalveolar lavage fluid (BALF). It rapidly identified a novel coronavirus (named 2019-nCoV according to World Health Organization announcement) which was the sole pathogens in the sample with very high abundance level (1.5% and 0.62% of total RNA sequenced). The entire viral genome is 29,881 nt in length (GenBank MN988668 and MN988669, Sequence Read Archive database Bioproject accession PRJNA601736) and is classified into beta-coronavirus genus. Phylogenetic analysis indicates that 2019-nCoV is close to coronaviruses (CoVs) circulating in *Rhinolophus* (Horseshoe bats), such as 98.7% nucleotide identity to partial RdRp gene of bat coronavirus strain BtCoV/4991 (GenBank KP876546, 370 nt sequence of RdRp and lack of other genome sequence) and 87.9% nucleotide identity to bat coronavirus strain bat-SL-CoVZC45 and bat-SL-CoVZXC21. Evolutionary analysis based on ORF1a/1b, S, and N genes also suggests 2019-nCoV is

more likely a novel CoV independently introduced from animals to humans.

Chen, Q., et al. (2020). "A report of clinical diagnosis and treatment of nine cases of coronavirus disease 2019." *J Med Virol*.

Coronavirus disease 2019 (COVID-19) caused by the severe acute respiratory syndrome coronavirus 2 has become an important public health issue in the world. More than 118 000 cases were confirmed around the world. The main clinical manifestations were respiratory symptoms and occasional gastrointestinal symptoms. However, there is no unified standard for the diagnosis and treatment of COVID-19. In the retrospective analysis, we report nine cases of COVID-19, describe the history of contact, clinical manifestations, the course of diagnosis and clinical treatment before, during and after treatment.

Chen, T. M., et al. (2020). "A mathematical model for simulating the phase-based transmissibility of a novel coronavirus." *Infect Dis Poverty* 9(1): 24.

BACKGROUND: As reported by the World Health Organization, a novel coronavirus (2019-nCoV) was identified as the causative virus of Wuhan pneumonia of unknown etiology by Chinese authorities on 7 January, 2020. The virus was named as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by International Committee on Taxonomy of Viruses on 11 February, 2020. This study aimed to develop a mathematical model for calculating the transmissibility of the virus. **METHODS:** In this study, we developed a Bats-Hosts-Reservoir-People transmission network model for simulating the potential transmission from the infection source (probably be bats) to the human infection. Since the Bats-Hosts-Reservoir network was hard to explore clearly and public concerns were focusing on the transmission from Huanan Seafood Wholesale Market (reservoir) to people, we simplified the model as Reservoir-People (RP) transmission network model. The next generation matrix approach was adopted to calculate the basic reproduction number (R_0) from the RP model to assess the transmissibility of the SARS-CoV-2. **RESULTS:** The value of R_0 was estimated of 2.30 from reservoir to person and 3.58 from person to person which means that the expected number of secondary infections that result from introducing a single infected individual into an otherwise susceptible population was 3.58. **CONCLUSIONS:** Our model showed that the transmissibility of SARS-CoV-2 was higher than the Middle East respiratory syndrome in the Middle East countries, similar to severe acute respiratory syndrome, but lower than MERS in the Republic of Korea.

Cheng, S. C., et al. (2020). "First case of Coronavirus Disease 2019 (COVID-19) pneumonia in Taiwan." *J Formos Med Assoc* 119(3): 747-751.

An outbreak of respiratory illness proved to be infected by a 2019 novel coronavirus, officially named Coronavirus Disease 2019 (COVID-19), was notified first in Wuhan, China, and has spread rapidly in China and to other parts of the world. Herein, we reported the first confirmed case of novel coronavirus pneumonia (NCP) imported from China in Taiwan. This case report revealed a natural course of NCP with self-recovery, which may be a good example in comparison with medical treatments.

Cleemput, S., et al. (2020). "Genome Detective Coronavirus Typing Tool for rapid identification and characterization of novel coronavirus genomes." *Bioinformatics*.

SUMMARY: Genome Detective is a web-based, user-friendly software application to quickly and accurately assemble all known virus genomes from next generation sequencing datasets. This application allows the identification of phylogenetic clusters and genotypes from assembled genomes in FASTA format. Since its release in 2019, we have produced a number of typing tools for emergent viruses that have caused large outbreaks, such as Zika and Yellow Fever Virus in Brazil. Here, we present The Genome Detective Coronavirus Typing Tool that can accurately identify the novel severe acute respiratory syndrome (SARS) related coronavirus (SARS-CoV-2) sequences isolated in China and around the world. The tool can accept up to 2,000 sequences per submission and the analysis of a new whole genome sequence will take approximately one minute. The tool has been tested and validated with hundreds of whole genomes from ten coronavirus species, and correctly classified all of the SARS-related coronavirus (SARSr-CoV) and all of the available public data for SARS-CoV-2. The tool also allows tracking of new viral mutations as the outbreak expands globally, which may help to accelerate the development of novel diagnostics, drugs and vaccines to stop the COVID-19 disease.

AVAILABILITY:

<https://www.genomedetective.com/app/typingtool/cov>.

SUPPLEMENTARY

INFORMATION:

Supplementary data are available at Bioinformatics online.

Cortegiani, A., et al. (2020). "A systematic review on the efficacy and safety of chloroquine for the treatment of COVID-19." *J Crit Care*.

PURPOSE: COVID-19 (coronavirus disease 2019) is a public health emergency of international concern. As of this time, there is no known effective

pharmaceutical treatment, although it is much needed for patient contracting the severe form of the disease. The aim of this systematic review was to summarize the evidence regarding chloroquine for the treatment of COVID-19. METHODS: PubMed, EMBASE, and three trial Registries were searched for studies on the use of chloroquine in patients with COVID-19. RESULTS: We included six articles (one narrative letter, one in-vitro study, one editorial, expert consensus paper, two national guideline documents) and 23 ongoing clinical trials in China. Chloroquine seems to be effective in limiting the replication of SARS-CoV-2 (virus causing COVID-19) in vitro. CONCLUSIONS: There is rationale, pre-clinical evidence of effectiveness and evidence of safety from long-time clinical use for other indications to justify clinical research on chloroquine in patients with COVID-19. However, clinical use should either adhere to the Monitored Emergency Use of Unregistered Interventions (MEURI) framework or be ethically approved as a trial as stated by the World Health Organization. Safety data and data from high-quality clinical trials are urgently needed.

Cucinotta, D. and M. Vanelli (2020). "WHO Declares COVID-19 a Pandemic." *Acta Biomed* **91**(1): 157-160.

The World Health Organization (WHO) on March 11, 2020, has declared the novel coronavirus (COVID-19) outbreak a global pandemic (1). At a news briefing, WHO Director-General, Dr. Tedros Adhanom Ghebreyesus, noted that over the past 2 weeks, the number of cases outside China increased 13-fold and the number of countries with cases increased threefold. Further increases are expected. He said that the WHO is "deeply concerned both by the alarming levels of spread and severity and by the alarming levels of inaction," and he called on countries to take action now to contain the virus. "We should double down," he said. "We should be more aggressive." [...].

Deng, S. Q. and H. J. Peng (2020). "Characteristics of and Public Health Responses to the Coronavirus Disease 2019 Outbreak in China." *J Clin Med* **9**(2).

In December 2019, cases of unidentified pneumonia with a history of exposure in the Huanan Seafood Market were reported in Wuhan, Hubei Province. A novel coronavirus, SARS-CoV-2, was identified to be accountable for this disease. Human-to-human transmission is confirmed, and this disease (named COVID-19 by World Health Organization (WHO)) spread rapidly around the country and the world. As of 18 February 2020, the number of confirmed cases had reached 75,199 with 2009

fatalities. The COVID-19 resulted in a much lower case-fatality rate (about 2.67%) among the confirmed cases, compared with Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS). Among the symptom composition of the 45 fatality cases collected from the released official reports, the top four are fever, cough, short of breath, and chest tightness/pain. The major comorbidities of the fatality cases include hypertension, diabetes, coronary heart disease, cerebral infarction, and chronic bronchitis. The source of the virus and the pathogenesis of this disease are still unconfirmed. No specific therapeutic drug has been found. The Chinese Government has initiated a level-1 public health response to prevent the spread of the disease. Meanwhile, it is also crucial to speed up the development of vaccines and drugs for treatment, which will enable us to defeat COVID-19 as soon as possible.

Dey, S. K., et al. (2020). "Analyzing the epidemiological outbreak of COVID-19: A visual exploratory data analysis approach." *J Med Virol*.

There is an obvious concern globally regarding the fact about the emerging coronavirus 2019 novel coronavirus (2019-nCoV) as a worldwide public health threat. As the outbreak of COVID-19 causes by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) progresses within China and beyond, rapidly available epidemiological data are needed to guide strategies for situational awareness and intervention. The recent outbreak of pneumonia in Wuhan, China, caused by the SARS-CoV-2 emphasizes the importance of analyzing the epidemiological data of this novel virus and predicting their risks of infecting people all around the globe. In this study, we present an effort to compile and analyze epidemiological outbreak information on COVID-19 based on the several open datasets on 2019-nCoV provided by the Johns Hopkins University, World Health Organization, Chinese Center for Disease Control and Prevention, National Health Commission, and DXY. An exploratory data analysis with visualizations has been made to understand the number of different cases reported (confirmed, death, and recovered) in different provinces of China and outside of China. Overall, at the outset of an outbreak like this, it is highly important to readily provide information to begin the evaluation necessary to understand the risks and begin containment activities.

Di Pierro, F., et al. (2020). "Possible therapeutic role of a highly standardized mixture of active compounds derived from cultured *Lentinula edodes* mycelia (AHCC) in patients infected with 2019 novel coronavirus." *Minerva Gastroenterol Dietol*.

The outbreak of SARS-CoV-2 disease (COVID-19) is currently, March 2020, affecting more than 100000 people worldwide and, according to the WHO (World Health Organization), a pandemic is shortly expected. The virus infects the lower respiratory tract and causes severe pneumonia and mortality in approximately 10% and 3-5%, respectively, of cases, mainly among the elderly and/or people affected by other diseases. AHCC is an alpha-glucan-based standardized mushroom extract that has been extensively investigated as an immunostimulant both in animals and/or in humans affected by West Nile virus, influenza virus, avian influenza virus, hepatitis C virus, papillomavirus, herpes virus, hepatitis B virus and HIV by promoting a regulated and protective immune response. Although the efficacy of AHCC has not yet been specifically evaluated with respect to SARS-CoV-2 disease, its action in promoting a protective response to a wide range of viral infections, and the current absence of effective vaccines, could support its use in the prevention of diseases provoked by human pathogenic coronavirus, including COVID-19.

Du, B., et al. (2020). "[Pharmacotherapeutics for the new coronavirus pneumonia]." Zhonghua Jie He He Hu Xi Za Zhi **43**(3): 173-176.

The new coronavirus pneumonia (NCP), also named as COVID-19 by WHO on Feb 11 2020, is now causing a severe public health emergency in China since. The number of diagnosed cases is more than 40,000 until the submission of this manuscript. Coronavirus has caused several epidemic situations world widely, but the present contagious disease caused by 2019 new coronavirus is unprecedentedly fulminating. The published cohorts of 2019 new coronavirus (n-Cov) are single-center studies, or retrospective studies. We here share the therapeutic experiences of NCP treatment with literature review. Combination of Ribavirin and interferon-alpha is recommended by the 5(th) edition National Health Commission's Regimen (Revised Edition) because of the effect on Middle East respiratory syndrome (MERS), and the effectiveness of Lopinavir/Ritonavir and Remdisivir needs to be confirmed by randomized controlled trial (RCT), given the situation of no specific antiviral drug on NCP is unavailable. Systemic glucocorticosteroid is recommended as a short term use (1~2 mg.kg (-1).d (-1), 3~5 d) by the 5(th) edition National Health Commission's Regimen (Revised Edition) yet RCTs are expected to confirm the effectiveness. Inappropriate application of antibiotics should be avoided, especially the combination of broad-spectrum antibiotics, for the NCP is not often complicated with bacterial infection.

Du, B., et al. (2020). "[Pharmacotherapeutics for the New Coronavirus Pneumonia]." Zhonghua Jie He He Hu Xi Za Zhi **43**(0): E012.

The New Coronavirus Pneumonia (NCP, also named as COVID-19 by WHO on Feb 11 2020, is now causing a severe public health emergency in China since. The number of diagnosed cases is more than 40,000 until the submission of this manuscript. Coronavirus has caused several epidemic situations world widely, but the present contagious disease caused by 2019 new Coronavirus is unprecedentedly fulminating. The published cohorts of 2019 new Coronavirus (n-Cov) are single-center studies, or retrospective studies. We here share the therapeutic experiences of NCP treatment with literature review. Combination of Ribavirin and Interferon-alpha is recommended by the 5(th) edition National Health Commission's Regimen (Revised Edition) because of the effect on MERS (Middle East Respiratory Syndrome), and the effectiveness of Lopinavir/Ritonavir and Remdisivir needs to be confirmed by randomized controlled trial (RCT), given the situation of no specific antiviral drug on NCP is unavailable. Systemic glucocorticosteroid is recommended as a short term use (1~2 mg.kg (-1).d (-1), 3~5d) by the 5(th) edition National Health Commission's Regimen (Revised Edition) yet RCTs are expected to confirm the effectiveness. Inappropriate application of antibiotics should be avoided, especially the combination of broad-spectrum antibiotics, for the NCP is not often complicated with bacterial infection.

Elfiky, A. A. (2020). "Anti-HCV, nucleotide inhibitors, repurposing against COVID-19." Life Sci **248**: 117477.

AIMS: A newly emerged Human Coronavirus (HCoV) is reported two months ago in Wuhan, China (COVID-19). Until today >2700 deaths from the 80,000 confirmed cases reported mainly in China and 40 other countries. Human to human transmission is confirmed for COVID-19 by China a month ago. Based on the World Health Organization (WHO) reports, SARS HCoV is responsible for >8000 cases with confirmed 774 deaths. Additionally, MERS HCoV is responsible for 858 deaths out of about 2500 reported cases. The current study aims to test anti-HCV drugs against COVID-19 RNA dependent RNA polymerase (RdRp). MATERIALS AND METHODS: In this study, sequence analysis, modeling, and docking are used to build a model for Wuhan COVID-19 RdRp. Additionally, the newly emerged Wuhan HCoV RdRp model is targeted by anti-polymerase drugs, including the approved drugs Sofosbuvir and Ribavirin. KEY FINDINGS: The results suggest the effectiveness of Sofosbuvir, IDX-184, Ribavirin, and

Remdisvir as potent drugs against the newly emerged HCoV disease. SIGNIFICANCE: The present study presents a perfect model for COVID-19 RdRp enabling its testing in silico against anti-polymerase drugs. Besides, the study presents some drugs that previously proved its efficiency against the newly emerged viral infection.

Fung, S. Y., et al. (2020). "A tug-of-war between severe acute respiratory syndrome coronavirus 2 and host antiviral defence: lessons from other pathogenic viruses." *Emerg Microbes Infect* **9**(1): 558-570.

World Health Organization has declared the ongoing outbreak of coronavirus disease 2019 (COVID-19) a Public Health Emergency of International Concern. The virus was named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by the International Committee on Taxonomy of Viruses. Human infection with SARS-CoV-2 leads to a wide range of clinical manifestations ranging from asymptomatic, mild, moderate to severe. The severe cases present with pneumonia, which can progress to acute respiratory distress syndrome. The outbreak provides an opportunity for real-time tracking of an animal coronavirus that has just crossed species barrier to infect humans. The outcome of SARS-CoV-2 infection is largely determined by virus-host interaction. Here, we review the discovery, zoonotic origin, animal hosts, transmissibility and pathogenicity of SARS-CoV-2 in relation to its interplay with host antiviral defense. A comparison with SARS-CoV, Middle East respiratory syndrome coronavirus, community-acquired human coronaviruses and other pathogenic viruses including human immunodeficiency viruses is made. We summarize current understanding of the induction of a proinflammatory cytokine storm by other highly pathogenic human coronaviruses, their adaptation to humans and their usurpation of the cell death programmes. Important questions concerning the interaction between SARS-CoV-2 and host antiviral defence, including asymptomatic and presymptomatic virus shedding, are also discussed.

Glasper, A. (2020). "Potential global pandemics: the role of the WHO and other public health bodies." *Br J Nurs* **29**(5): 322-323.

In light of the emergence of the new coronavirus in China, Emeritus Professor Alan Glasper, from the University of Southampton, discusses the response strategies adopted by international and national public health agencies.

Goh, G. K., et al. (2020). "Rigidity of the Outer Shell Predicted by a Protein Intrinsic Disorder Model

Sheds Light on the COVID-19 (Wuhan-2019-nCoV) Infectivity." *Biomolecules* **10**(2).

The world is currently witnessing an outbreak of a new coronavirus spreading quickly across China and affecting at least 24 other countries. With almost 65,000 infected, a worldwide death toll of at least 1370 (as of 14 February 2020), and with the potential to affect up to two-thirds of the world population, COVID-19 is considered by the World Health Organization (WHO) to be a global health emergency. The speed of spread and infectivity of COVID-19 (also known as Wuhan-2019-nCoV) are dramatically exceeding those of the Middle East respiratory syndrome coronavirus (MERS-CoV) and severe acute respiratory syndrome coronavirus (SARS-CoV). In fact, since September 2012, the WHO has been notified of 2494 laboratory-confirmed cases of infection with MERS-CoV, whereas the 2002-2003 epidemic of SARS affected 26 countries and resulted in more than 8000 cases. Therefore, although SARS, MERS, and COVID-19 are all the result of coronaviral infections, the causes of the coronaviruses differ dramatically in their transmissibility. It is likely that these differences in infectivity of coronaviruses can be attributed to the differences in the rigidity of their shells which can be evaluated using computational tools for predicting intrinsic disorder predisposition of the corresponding viral proteins.

Gralinski, L. E. and V. D. Menachery (2020). "Return of the Coronavirus: 2019-nCoV." *Viruses* **12**(2).

The emergence of a novel coronavirus (2019-nCoV) has awakened the echoes of SARS-CoV from nearly two decades ago. Yet, with technological advances and important lessons gained from previous outbreaks, perhaps the world is better equipped to deal with the most recent emergent group 2B coronavirus.

Guo, Y. R., et al. (2020). "The origin, transmission and clinical therapies on coronavirus disease 2019 (COVID-19) outbreak - an update on the status." *Mil Med Res* **7**(1): 11.

An acute respiratory disease, caused by a novel coronavirus (SARS-CoV-2, previously known as 2019-nCoV), the coronavirus disease 2019 (COVID-19) has spread throughout China and received worldwide attention. On 30 January 2020, World Health Organization (WHO) officially declared the COVID-19 epidemic as a public health emergency of international concern. The emergence of SARS-CoV-2, since the severe acute respiratory syndrome coronavirus (SARS-CoV) in 2002 and Middle East respiratory syndrome coronavirus (MERS-CoV) in 2012, marked the third introduction of a highly pathogenic and large-scale epidemic coronavirus into

the human population in the twenty-first century. As of 1 March 2020, a total of 87,137 confirmed cases globally, 79,968 confirmed in China and 7169 outside of China, with 2977 deaths (3.4%) had been reported by WHO. Meanwhile, several independent research groups have identified that SARS-CoV-2 belongs to beta-coronavirus, with highly identical genome to bat coronavirus, pointing to bat as the natural host. The novel coronavirus uses the same receptor, angiotensin-converting enzyme 2 (ACE2) as that for SARS-CoV, and mainly spreads through the respiratory tract. Importantly, increasingly evidence showed sustained human-to-human transmission, along with many exported cases across the globe. The clinical symptoms of COVID-19 patients include fever, cough, fatigue and a small population of patients appeared gastrointestinal infection symptoms. The elderly and people with underlying diseases are susceptible to infection and prone to serious outcomes, which may be associated with acute respiratory distress syndrome (ARDS) and cytokine storm. Currently, there are few specific antiviral strategies, but several potent candidates of antivirals and repurposed drugs are under urgent investigation. In this review, we summarized the latest research progress of the epidemiology, pathogenesis, and clinical characteristics of COVID-19, and discussed the current treatment and scientific advancements to combat the epidemic novel coronavirus.

Haider, N., et al. (2020). "Passengers' destinations from China: low risk of Novel Coronavirus (2019-nCoV) transmission into Africa and South America." *Epidemiol Infect* **148**: e41.

Novel Coronavirus (2019-nCoV [SARS-COV-2]) was detected in humans during the last week of December 2019 at Wuhan city in China, and caused 24 554 cases in 27 countries and territories as of 5 February 2020. The objective of this study was to estimate the risk of transmission of 2019-nCoV through human passenger air flight from four major cities of China (Wuhan, Beijing, Shanghai and Guangzhou) to the passengers' destination countries. We extracted the weekly simulated passengers' end destination data for the period of 1-31 January 2020 from FLIRT, an online air travel dataset that uses information from 800 airlines to show the direct flight and passengers' end destination. We estimated a risk index of 2019-nCoV transmission based on the number of travellers to destination countries, weighted by the number of confirmed cases of the departed city reported by the World Health Organization (WHO). We ranked each country based on the risk index in four quantiles (4th quantile being the highest risk and 1st quantile being the lowest risk). During the period, 388 287 passengers were destined for 1297 airports in

168 countries or territories across the world. The risk index of 2019-nCoV among the countries had a very high correlation with the WHO-reported confirmed cases (0.97). According to our risk score classification, of the countries that reported at least one Coronavirus-infected pneumonia (COVID-19) case as of 5 February 2020, 24 countries were in the 4th quantile of the risk index, two in the 3rd quantile, one in the 2nd quantile and none in the 1st quantile. Outside China, countries with a higher risk of 2019-nCoV transmission are Thailand, Cambodia, Malaysia, Canada and the USA, all of which reported at least one case. In pan-Europe, UK, France, Russia, Germany and Italy; in North America, USA and Canada; in Oceania, Australia had high risk, all of them reported at least one case. In Africa and South America, the risk of transmission is very low with Ethiopia, South Africa, Egypt, Mauritius and Brazil showing a similar risk of transmission compared to the risk of any of the countries where at least one case is detected. The risk of transmission on 31 January 2020 was very high in neighbouring Asian countries, followed by Europe (UK, France, Russia and Germany), Oceania (Australia) and North America (USA and Canada). Increased public health response including early case recognition, isolation of identified case, contact tracing and targeted airport screening, public awareness and vigilance of health workers will help mitigate the force of further spread to naive countries.

Hanley, B., et al. (2020). "Autopsy in suspected COVID-19 cases." *J Clin Pathol*.

The severe acute respiratory syndrome (SARS)-coronavirus-2 (CoV-2) outbreak in Wuhan, China, has now spread to many countries across the world including the UK with over 3000 deaths as of early March 2020. This will inevitably lead to an increase in the number of suspected coronavirus disease 2019 (COVID-19)-related deaths at autopsy. The Royal College of Pathologists has responded to this concern with the release of guidelines on autopsy practice relating to COVID-19. The following article is a summary and interpretation of these guidelines. It includes a description of hazard group 3 organisms to which SARS-CoV-2 has been assigned, a brief description of what is currently known about the pathological and autopsy findings in COVID-19, a summary of the recommendations for conducting autopsies in suspected COVID-19 cases and the techniques for making the diagnosis at autopsy. It concludes by considering the clinicopathological correlation and notification of such cases.

He, F., et al. (2020). "Coronavirus Disease 2019 (COVID-19): What we know?" *J Med Virol*.

In late December 2019, a cluster of unexplained pneumonia cases has been reported in Wuhan, China. A few days later, the causative agent of this mysterious pneumonia was identified as a novel coronavirus. This causative virus has been temporarily named as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and the relevant infected disease has been named as coronavirus disease 2019 (COVID-19) by the World Health Organization respectively. The COVID-19 epidemic is spreading in China and all over the world now. The purpose of this review is primarily to review the pathogen, clinical features, diagnosis, and treatment of COVID-19, but also to comment briefly on the epidemiology and pathology based on the current evidences. This article is protected by copyright. All rights reserved.

Jalava, K. (2020). "First respiratory transmitted food borne outbreak?" *Int J Hyg Environ Health* **226**: 113490.

The world is faced with a remarkable coronavirus outbreak with epicentre in Wuhan, China. Altogether 40554 cases have been confirmed globally with novel coronavirus (SARS-CoV-2) until February 10, 2020. Rigorous surveillance in other countries is required to prevent further global expansion of the outbreak, but resolving the exact mechanism of the initial transmission events is crucial. Most initial cases had visited Huanan South Seafood Market in Wuhan selling also various exotic live animals. Based on the limited initial human-to-human transmission and timely clustering of cases in Huanan market among elderly men, coupled with knowledge that coronaviruses are derived from animals and relationship of SARS-CoV-2 to bat coronavirus, zoonotic transmission in the first instance is probable. To target the actions, similar epidemiological actions to human cases are needed with animal or food exposures. According to current information, an exceptionally wide contamination of seafood market might explain the initiation of the SARS-CoV-2 outbreak. Seafood tanks, air contamination by live animals or rodents are possibilities, but sold animals normally come from various sources. The mode of transmission may become clearer in future: usually in outbreak investigations, hindsight is easy, but for now information about the initial source of this outbreak is limited.

Jernigan, D. B. and C. C.-R. Team (2020). "Update: Public Health Response to the Coronavirus Disease 2019 Outbreak - United States, February 24, 2020." *MMWR Morb Mortal Wkly Rep* **69**(8): 216-219.

An outbreak of coronavirus disease 2019 (COVID-19) caused by the 2019 novel coronavirus

(SARS-CoV-2) began in Wuhan, Hubei Province, China in December 2019, and has spread throughout China and to 31 other countries and territories, including the United States (1). As of February 23, 2020, there were 76,936 reported cases in mainland China and 1,875 cases in locations outside mainland China (1). There have been 2,462 associated deaths worldwide; no deaths have been reported in the United States. Fourteen cases have been diagnosed in the United States, and an additional 39 cases have occurred among repatriated persons from high-risk settings, for a current total of 53 cases within the United States. This report summarizes the aggressive measures (2,3) that CDC, state and local health departments, multiple other federal agencies, and other partners are implementing to slow and try to contain transmission of COVID-19 in the United States. These measures require the identification of cases and contacts of persons with COVID-19 in the United States and the recommended assessment, monitoring, and care of travelers arriving from areas with substantial COVID-19 transmission. Although these measures might not prevent widespread transmission of the virus in the United States, they are being implemented to 1) slow the spread of illness; 2) provide time to better prepare state and local health departments, health care systems, businesses, educational organizations, and the general public in the event that widespread transmission occurs; and 3) better characterize COVID-19 to guide public health recommendations and the development and deployment of medical countermeasures, including diagnostics, therapeutics, and vaccines. U.S. public health authorities are monitoring the situation closely, and CDC is coordinating efforts with the World Health Organization (WHO) and other global partners. Interim guidance is available at <https://www.cdc.gov/coronavirus/index.html>. As more is learned about this novel virus and this outbreak, CDC will rapidly incorporate new knowledge into guidance for action by CDC, state and local health departments, health care providers, and communities.

Ji, L. N., et al. (2020). "Clinical features of pediatric patients with COVID-19: a report of two family cluster cases." *World J Pediatr*.

BACKGROUND: Coronavirus disease 2019 (COVID-19) has spread rapidly across the globe. People of all ages are susceptible to COVID-19. However, literature reports on pediatric patients are limited. **METHODS:** To improve the recognition of COVID-19 infection in children, we retrospectively reviewed two confirmed pediatric cases from two family clusters. Both clinical features and laboratory examination results of the children and their family members were described. **RESULTS:** The two

confirmed children only presented with mild respiratory or gastrointestinal symptoms. Both of them had normal chest CT images. After general and symptomatic treatments, both children recovered quickly. Both families had travel histories to Hubei Province. CONCLUSIONS: Pediatric patients with COVID-19 are mostly owing to family cluster or with a close contact history. Infected children have relatively milder clinical symptoms than infected adults. We should attach importance to early recognition, early diagnosis, and early treatment of infected children.

Ji, W., et al. (2020). "Cross-species transmission of the newly identified coronavirus 2019-nCoV." *J Med Virol* **92**(4): 433-440.

The current outbreak of viral pneumonia in the city of Wuhan, China, was caused by a novel coronavirus designated 2019-nCoV by the World Health Organization, as determined by sequencing the viral RNA genome. Many initial patients were exposed to wildlife animals at the Huanan seafood wholesale market, where poultry, snake, bats, and other farm animals were also sold. To investigate possible virus reservoir, we have carried out comprehensive sequence analysis and comparison in conjunction with relative synonymous codon usage (RSCU) bias among different animal species based on the 2019-nCoV sequence. Results obtained from our analyses suggest that the 2019-nCoV may appear to be a recombinant virus between the bat coronavirus and an origin-unknown coronavirus. The recombination may occurred within the viral spike glycoprotein, which recognizes a cell surface receptor. Additionally, our findings suggest that 2019-nCoV has most similar genetic information with bat coronavirus and most similar codon usage bias with snake. Taken together, our results suggest that homologous recombination may occur and contribute to the 2019-nCoV cross-species transmission.

Jin, Y. H., et al. (2020). "A rapid advice guideline for the diagnosis and treatment of 2019 novel coronavirus (2019-nCoV) infected pneumonia (standard version)." *Mil Med Res* **7**(1): 4.

In December 2019, a new type viral pneumonia cases occurred in Wuhan, Hubei Province; and then named "2019 novel coronavirus (2019-nCoV)" by the World Health Organization (WHO) on 12 January 2020. For it is a never been experienced respiratory disease before and with infection ability widely and quickly, it attracted the world's attention but without treatment and control manual. For the request from frontline clinicians and public health professionals of 2019-nCoV infected pneumonia management, an evidence-based guideline urgently needs to be

developed. Therefore, we drafted this guideline according to the rapid advice guidelines methodology and general rules of WHO guideline development; we also added the first-hand management data of Zhongnan Hospital of Wuhan University. This guideline includes the guideline methodology, epidemiological characteristics, disease screening and population prevention, diagnosis, treatment and control (including traditional Chinese Medicine), nosocomial infection prevention and control, and disease nursing of the 2019-nCoV. Moreover, we also provide a whole process of a successful treatment case of the severe 2019-nCoV infected pneumonia and experience and lessons of hospital rescue for 2019-nCoV infections. This rapid advice guideline is suitable for the first frontline doctors and nurses, managers of hospitals and healthcare sections, community residents, public health persons, relevant researchers, and all person who are interested in the 2019-nCoV.

Kamel Boulos, M. N. and E. M. Geraghty (2020). "Geographical tracking and mapping of coronavirus disease COVID-19/severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) epidemic and associated events around the world: how 21st century GIS technologies are supporting the global fight against outbreaks and epidemics." *Int J Health Geogr* **19**(1): 8.

In December 2019, a new virus (initially called 'Novel Coronavirus 2019-nCoV' and later renamed to SARS-CoV-2) causing severe acute respiratory syndrome (coronavirus disease COVID-19) emerged in Wuhan, Hubei Province, China, and rapidly spread to other parts of China and other countries around the world, despite China's massive efforts to contain the disease within Hubei. As with the original SARS-CoV epidemic of 2002/2003 and with seasonal influenza, geographic information systems and methods, including, among other application possibilities, online real-or near-real-time mapping of disease cases and of social media reactions to disease spread, predictive risk mapping using population travel data, and tracing and mapping super-spreader trajectories and contacts across space and time, are proving indispensable for timely and effective epidemic monitoring and response. This paper offers pointers to, and describes, a range of practical online/mobile GIS and mapping dashboards and applications for tracking the 2019/2020 coronavirus epidemic and associated events as they unfold around the world. Some of these dashboards and applications are receiving data updates in near-real-time (at the time of writing), and one of them is meant for individual users (in China) to check if the app user has had any close contact with a person confirmed or suspected to have been infected with SARS-CoV-2 in the recent past. We also discuss

additional ways GIS can support the fight against infectious disease outbreaks and epidemics.

Kandel, N., et al. (2020). "Health security capacities in the context of COVID-19 outbreak: an analysis of International Health Regulations annual report data from 182 countries." *Lancet*.

BACKGROUND: Public health measures to prevent, detect, and respond to events are essential to control public health risks, including infectious disease outbreaks, as highlighted in the International Health Regulations (IHR). In light of the outbreak of 2019 novel coronavirus disease (COVID-19), we aimed to review existing health security capacities against public health risks and events. **METHODS:** We used 18 indicators from the IHR State Party Annual Reporting (SPAR) tool and associated data from national SPAR reports to develop five indices: (1) prevent, (2) detect, (3) respond, (4) enabling function, and (5) operational readiness. We used SPAR 2018 data for all of the indicators and categorised countries into five levels across the indices, in which level 1 indicated the lowest level of national capacity and level 5 the highest. We also analysed data at the regional level (using the six geographical WHO regions). **FINDINGS:** Of 182 countries, 52 (28%) had prevent capacities at levels 1 or 2, and 60 (33%) had response capacities at levels 1 or 2. 81 (45%) countries had prevent capacities and 78 (43%) had response capacities at levels 4 or 5, indicating that these countries were operationally ready. 138 (76%) countries scored more highly in the detect index than in the other indices. 44 (24%) countries did not have an effective enabling function for public health risks and events, including infectious disease outbreaks (7 [4%] at level 1 and 37 [20%] at level 2). 102 (56%) countries had level 4 or level 5 enabling function capacities in place. 32 (18%) countries had low readiness (2 [1%] at level 1 and 30 [17%] at level 2), and 104 (57%) countries were operationally ready to prevent, detect, and control an outbreak of a novel infectious disease (66 [36%] at level 4 and 38 [21%] at level 5). **INTERPRETATION:** Countries vary widely in terms of their capacity to prevent, detect, and respond to outbreaks. Half of all countries analysed have strong operational readiness capacities in place, which suggests that an effective response to potential health emergencies could be enabled, including to COVID-19. Findings from local risk assessments are needed to fully understand national readiness capacities in relation to COVID-19. Capacity building and collaboration between countries are needed to strengthen global readiness for outbreak control. **FUNDING:** None.

Kannan, S., et al. (2020). "COVID-19 (Novel Coronavirus 2019) - recent trends." *Eur Rev Med Pharmacol Sci* **24**(4): 2006-2011.

The World Health Organization (WHO) has issued a warning that, although the 2019 novel coronavirus (COVID-19) from Wuhan City (China), is not pandemic, it should be contained to prevent the global spread. The COVID-19 virus was known earlier as 2019-nCoV. As of 12 February 2020, WHO reported 45,171 cases and 1115 deaths related to COVID-19. COVID-19 is similar to Severe Acute Respiratory Syndrome coronavirus (SARS-CoV) virus in its pathogenicity, clinical spectrum, and epidemiology. Comparison of the genome sequences of COVID-19, SARS-CoV, and Middle East Respiratory Syndrome coronavirus (MERS-CoV) showed that COVID-19 has a better sequence identity with SARS-CoV compared to MERS CoV. However, the amino acid sequence of COVID-19 differs from other coronaviruses specifically in the regions of 1ab polyprotein and surface glycoprotein or S-protein. Although several animals have been speculated to be a reservoir for COVID-19, no animal reservoir has been already confirmed. COVID-19 causes COVID-19 disease that has similar symptoms as SARS-CoV. Studies suggest that the human receptor for COVID-19 may be angiotensin-converting enzyme 2 (ACE2) receptor similar to that of SARS-CoV. The nucleocapsid (N) protein of COVID-19 has nearly 90% amino acid sequence identity with SARS-CoV. The N protein antibodies of SARS-CoV may cross react with COVID-19 but may not provide cross-immunity. In a similar fashion to SARS-CoV, the N protein of COVID-19 may play an important role in suppressing the RNA interference (RNAi) to overcome the host defense. This mini-review aims at investigating the most recent trend of COVID-19.

Kim, J. M., et al. (2020). "Identification of Coronavirus Isolated from a Patient in Korea with COVID-19." *Osong Public Health Res Perspect* **11**(1): 3-7.

Objectives: Following reports of patients with unexplained pneumonia at the end of December 2019 in Wuhan, China, the causative agent was identified as coronavirus (SARS-CoV-2), and the 2019 novel coronavirus disease was named COVID-19 by the World Health Organization. Putative patients with COVID-19 have been identified in South Korea, and attempts have been made to isolate the pathogen from these patients. **Methods:** Upper and lower respiratory tract secretion samples from putative patients with COVID-19 were inoculated onto cells to isolate the virus. Full genome sequencing and electron microscopy were used to identify the virus. **Results:** The virus replicated in Vero cells and cytopathic

effects were observed. Full genome sequencing showed that the virus genome exhibited sequence homology of more than 99.9% with SARS-CoV-2 which was isolated from patients from other countries, for instance China. Sequence homology of SARS-CoV-2 with SARS-CoV, and MERS-CoV was 77.5% and 50%, respectively. Coronavirus-specific morphology was observed by electron microscopy in virus-infected Vero cells. Conclusion: SARS-CoV-2 was isolated from putative patients with unexplained pneumonia and intermittent coughing and fever. The isolated virus was named BetaCoV/Korea/KCDC03/2020.

Kim, J. Y., et al. (2020). "Viral Load Kinetics of SARS-CoV-2 Infection in First Two Patients in Korea." *J Korean Med Sci* **35**(7): e86.

As of February 2020, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) outbreak started in China in December 2019 has been spreading in many countries in the world. With the numbers of confirmed cases are increasing, information on the epidemiologic investigation and clinical manifestation have been accumulated. However, data on viral load kinetics in confirmed cases are lacking. Here, we present the viral load kinetics of the first two confirmed patients with mild to moderate illnesses in Korea in whom distinct viral load kinetics are shown. This report suggests that viral load kinetics of SARS-CoV-2 may be different from that of previously reported other coronavirus infections such as SARS-CoV.

Koonin, L. M. (2020). "Novel coronavirus disease (COVID-19) outbreak: Now is the time to refresh pandemic plans." *J Bus Contin Emer Plan* **13**(4): 1-15.

This article outlines practical steps that businesses can take now to prepare for a pandemic. Given the current growing spread of coronavirus disease 2019 (COVID-19) around the world, it is imperative that businesses review their pandemic plans and be prepared in case this epidemic expands and affects more people and communities. Preparing for a potential infectious disease pandemic from influenza or a novel corona virus is an essential component of a business continuity plan, especially for businesses that provide critical healthcare and infrastructure services. Although many businesses and organisations have a pandemic plan or address pandemic preparedness in their business continuity plans, few have recently tested and updated their plans. Pandemics can not only interrupt an organisation's operations and compromise long-term viability of an enterprise, but also disrupt the provision of critical functions. Businesses that regularly test and update their pandemic plan can

significantly reduce harmful impacts to the business, play a key role in protecting employees' and customers' health and safety, and limit the negative impact of a pandemic on the community and economy.

Kruse, R. L. (2020). "Therapeutic strategies in an outbreak scenario to treat the novel coronavirus originating in Wuhan, China." *F1000Res* **9**: 72.

A novel coronavirus (2019-nCoV) originating in Wuhan, China presents a potential respiratory viral pandemic to the world population. Current efforts are focused on containment and quarantine of infected individuals. Ultimately, the outbreak could be controlled with a protective vaccine to prevent 2019-nCoV infection. While vaccine research should be pursued intensely, there exists today no therapy to treat 2019-nCoV upon infection, despite an urgent need to find options to help these patients and preclude potential death. Herein, I review the potential options to treat 2019-nCoV in patients, with an emphasis on the necessity for speed and timeliness in developing new and effective therapies in this outbreak. I consider the options of drug repurposing, developing neutralizing monoclonal antibody therapy, and an oligonucleotide strategy targeting the viral RNA genome, emphasizing the promise and pitfalls of these approaches. Finally, I advocate for the fastest strategy to develop a treatment now, which could be resistant to any mutations the virus may have in the future. The proposal is a biologic that blocks 2019-nCoV entry using a soluble version of the viral receptor, angiotensin-converting enzyme 2 (ACE2), fused to an immunoglobulin Fc domain, providing a neutralizing antibody with maximal breath to avoid any viral escape, while also helping to recruit the immune system to build lasting immunity. The sequence of the ACE2-Fc protein is provided to investigators, allowing its possible use in recombinant protein expression systems to start producing drug today to treat patients under compassionate use, while formal clinical trials are later undertaken. Such a treatment could help infected patients before a protective vaccine is developed and widely available in the coming months to year (s).

Kumar, D., et al. (2020). "COVID-19: A Global Transplant Perspective on Successfully Navigating a Pandemic." *Am J Transplant*.

The COVID-19 pandemic has rapidly evolved and changed our way of life in an unprecedented manner. The emergence of COVID-19 has impacted transplantation worldwide. The impact has not been just restricted to issues pertaining to donors or recipients, but also health care resource utilization as the intensity of cases in certain jurisdictions exceeds available capacity. Here we provide a personal

viewpoint representing different jurisdictions from around the world in order to outline the impact of the current COVID-19 pandemic on organ transplantation. Based on our collective experience, we discuss mitigation strategies such as donor screening, resource planning and a staged approach to transplant volume considerations as local resource issues demand. We also discuss issues related to transplant-related research during the pandemic, the role of transplant infectious diseases and the influence of transplant societies for education and disseminating current information.

Lai, C. C., et al. (2020). "Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): The epidemic and the challenges." *Int J Antimicrob Agents* **55**(3): 105924.

The emergence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2; previously provisionally named 2019 novel coronavirus or 2019-nCoV) disease (COVID-19) in China at the end of 2019 has caused a large global outbreak and is a major public health issue. As of 11 February 2020, data from the World Health Organization (WHO) have shown that more than 43 000 confirmed cases have been identified in 28 countries/regions, with >99% of cases being detected in China. On 30 January 2020, the WHO declared COVID-19 as the sixth public health emergency of international concern. SARS-CoV-2 is closely related to two bat-derived severe acute respiratory syndrome-like coronaviruses, bat-SL-CoVZC45 and bat-SL-CoVZXC21. It is spread by human-to-human transmission via droplets or direct contact, and infection has been estimated to have mean incubation period of 6.4 days and a basic reproduction number of 2.24-3.58. Among patients with pneumonia caused by SARS-CoV-2 (novel coronavirus pneumonia or Wuhan pneumonia), fever was the most common symptom, followed by cough. Bilateral lung involvement with ground-glass opacity was the most common finding from computed tomography images of the chest. The one case of SARS-CoV-2 pneumonia in the USA is responding well to remdesivir, which is now undergoing a clinical trial in China. Currently, controlling infection to prevent the spread of SARS-CoV-2 is the primary intervention being used. However, public health authorities should keep monitoring the situation closely, as the more we can learn about this novel virus and its associated outbreak, the better we can respond.

Lau, H., et al. (2020). "Internationally lost COVID-19 cases." *J Microbiol Immunol Infect*.

BACKGROUND: With its epicenter in Wuhan, China, the COVID-19 outbreak was declared a

pandemic by the World Health Organization (WHO). While many countries have implemented flight restrictions to China, an increasing number of cases with or without travel background to China are confirmed daily. These developments support concerns on possible unidentified and unreported international COVID-19 cases, which could lead to new local disease epicenters. METHODS: We have analyzed all available data on the development of international COVID-19 cases from January 20th, 2020 until February 18th, 2020. COVID-19 cases with and without travel history to China were divided into cohorts according to the Healthcare Access and Quality Index (HAQ-Index) of each country. Chi-square and Post-hoc testing were performed. RESULTS: While COVID-19 cases with travel history to China seem to peak for each HAQ-cohort, the number of non-travel related COVID-19 cases seem to continuously increase in the HAQ-cohort of countries with higher medical standards. Further analyses demonstrate a significantly lower proportion of reported COVID-19 cases without travel history to China in countries with lower HAQ (HAQ I vs. HAQ II, posthoc $p < 0.01$). CONCLUSIONS: Our data indicate that countries with lower HAQ-index may either underreport COVID-19 cases or are unable to adequately detect them. Although our data may be incomplete and must be interpreted with caution, inconsistencies in reporting COVID-19 cases is a serious problem which might sabotage efforts to contain the virus.

Lau, H., et al. (2020). "The positive impact of lockdown in Wuhan on containing the COVID-19 outbreak in China." *J Travel Med*.

BACKGROUND: With its epicenter in Wuhan, China, the COVID-19 outbreak was declared a public health emergency of international concern (PHEIC) by the World Health Organization (WHO). Consequently, many countries have implemented flight restrictions to China. China itself has imposed a lockdown of the population of Wuhan as well as the entire Hubei province. However, whether these two enormous measures have led to significant changes in the spread of COVID-19 cases remains unclear. METHODS: We analyzed available data on the development of confirmed domestic and international COVID-19 cases before and after lockdown measures. We evaluated the correlation of domestic air traffic to the number of confirmed COVID-19 cases and determined the growth curves of COVID-19 cases within China before and after lockdown as well as after changes in COVID-19 diagnostic criteria. RESULTS: Our findings indicate a significant increase in doubling time from 2 days (95% Confidence Interval, CI): 1.9-2.6), to 4 days (95% CI: 3.5-4.3), after imposing

lockdown. A further increase is detected after changing diagnostic and testing methodology to 19.3 (95% CI: 15.1-26.3), respectively. Moreover, the correlation between domestic air traffic and COVID-19 spread became weaker following lockdown (before lockdown: $r = 0.98$, $p < 0.05$ vs. after lockdown: $r = 0.91$, $p = \text{NS}$). CONCLUSIONS: A significantly decreased growth rate and increased doubling time of cases was observed, which is most likely due to Chinese lockdown measures. A more stringent confinement of people in high risk areas seem to have a potential to slow down the spread of COVID-19.

Legido-Quigley, H., et al. (2020). "Are high-performing health systems resilient against the COVID-19 epidemic?" *Lancet* **395**(10227): 848-850.

Li, H., et al. (2020). "The novel coronavirus outbreak: what can be learned from China in public reporting?" *Glob Health Res Policy* **5**: 9.

The new coronavirus outbreak gets everyone's attention. China's national actions against the outbreak have contributed great contributions to the world. China has been learning from practice for better reporting and is fast to adapt itself. In this article we discuss China's practice in public reporting and its implications to global health. Confirmed cases, dynamic suspected cases, recovered cases, and deaths have been reported both in accumulative numbers and their daily updates. Some ratio indicators reporting (fatality rate, recovery rate, etc.), trend reporting, and global surveillance have been applied as well. Some improvements can still be made. It is necessary to further explore the influential factors behind the indicators for interventions. Recommendations are made to the World Health Organization and other countries for better public reporting and surveillance.

Li, J. Y., et al. (2020). "The epidemic of 2019-novel-coronavirus (2019-nCoV) pneumonia and insights for emerging infectious diseases in the future." *Microbes Infect* **22**(2): 80-85.

At the end of December 2019, a novel coronavirus, 2019-nCoV, caused an outbreak of pneumonia spreading from Wuhan, Hubei province, to the whole country of China, which has posed great threats to public health and attracted enormous attention around the world. To date, there are no clinically approved vaccines or antiviral drugs available for these human coronavirus infections. Intensive research on the novel emerging human infectious coronaviruses is urgently needed to elucidate their route of transmission and pathogenic mechanisms, and to identify potential drug targets, which would promote the development of effective preventive and therapeutic countermeasures. Herein,

we describe the epidemic and etiological characteristics of 2019-nCoV, discuss its essential biological features, including tropism and receptor usage, summarize approaches for disease prevention and treatment, and speculate on the transmission route of 2019-nCoV.

Li, L., et al. (2020). "Artificial Intelligence Distinguishes COVID-19 from Community Acquired Pneumonia on Chest CT." *Radiology*: 200905.

Background Coronavirus disease has widely spread all over the world since the beginning of 2020. It is desirable to develop automatic and accurate detection of COVID-19 using chest CT. Purpose To develop a fully automatic framework to detect COVID-19 using chest CT and evaluate its performances. Materials and Methods In this retrospective and multi-center study, a deep learning model, COVID-19 detection neural network (COVNet), was developed to extract visual features from volumetric chest CT exams for the detection of COVID-19. Community acquired pneumonia (CAP) and other non-pneumonia CT exams were included to test the robustness of the model. The datasets were collected from 6 hospitals between August 2016 and February 2020. Diagnostic performance was assessed by the area under the receiver operating characteristic curve (AUC), sensitivity and specificity. Results The collected dataset consisted of 4356 chest CT exams from 3,322 patients. The average age is 49+/-15 years and there were slightly more male patients than female (1838 vs 1484; p-value=0.29). The per-exam sensitivity and specificity for detecting COVID-19 in the independent test set was 114 of 127 (90% [95% CI: 83%, 94%]) and 294 of 307 (96% [95% CI: 93%, 98%]), respectively, with an AUC of 0.96 (p-value<0.001). The per-exam sensitivity and specificity for detecting CAP in the independent test set was 87% (152 of 175) and 92% (239 of 259), respectively, with an AUC of 0.95 (95% CI: 0.93, 0.97). Conclusions A deep learning model can accurately detect COVID-19 and differentiate it from community acquired pneumonia and other lung diseases.

Li, X., et al. (2020). "[Preliminary Recommendations for Lung Surgery during 2019 Novel Coronavirus Disease (COVID-19) Epidemic Period]." *Zhongguo Fei Ai Za Zhi* **23**(3): 133-135.

In December 2019, China diagnosed the first patient with 2019 novel coronavirus disease (COVID-19), and the following development of the epidemic had a huge impact on China and the whole world. For patients with lung occupying lesions, the whole process of diagnosis and treatment can not be carried out as usual due to the epidemic. For thoracic surgeons, the timing of surgical intervention should be very

carefully considered. All thoracic surgeons in China should work together to develop the proper procedures for the diagnosis and treatment in this special situation, and continuously update the recommendations based on epidemic changes and further understanding of COVID-19. Here, we only offer some preliminary suggestions based on our own knowledge for further reference and discussion.

Li, Y. C., et al. (2020). "The neuroinvasive potential of SARS-CoV2 may play a role in the respiratory failure of COVID-19 patients." J Med Virol.

Following the severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV), another highly pathogenic coronavirus named SARS-CoV-2 (previously known as 2019-nCoV) emerged in December 2019 in Wuhan, China, and rapidly spreads around the world. This virus shares highly homological sequence with SARS-CoV, and causes acute, highly lethal pneumonia coronavirus disease 2019 (COVID-19) with clinical symptoms similar to those reported for SARS-CoV and MERS-CoV. The most characteristic symptom of patients with COVID-19 is respiratory distress, and most of the patients admitted to the intensive care could not breathe spontaneously. Additionally, some patients with COVID-19 also showed neurologic signs, such as headache, nausea, and vomiting. Increasing evidence shows that coronaviruses are not always confined to the respiratory tract and that they may also invade the central nervous system inducing neurological diseases. The infection of SARS-CoV has been reported in the brains from both patients and experimental animals, where the brainstem was heavily infected. Furthermore, some coronaviruses have been demonstrated able to spread via a synapse-connected route to the medullary cardiorespiratory center from the mechanoreceptors and chemoreceptors in the lung and lower respiratory airways. Considering the high similarity between SARS-CoV and SARS-CoV2, it remains to make clear whether the potential invasion of SARS-CoV2 is partially responsible for the acute respiratory failure of patients with COVID-19. Awareness of this may have a guiding significance for the prevention and treatment of the SARS-CoV-2-induced respiratory failure.

Lin, C., et al. (2020). "Asymptomatic novel coronavirus pneumonia patient outside Wuhan: The value of CT images in the course of the disease." Clin Imaging **63**: 7-9.

The purpose of this case report is to describe the imaging and associated clinical features of an asymptomatic novel coronavirus pneumonia (COVID-19) patient outside Wuhan, China. The principle

findings are that in this patient with laboratory-confirmed COVID-19, CT findings preceded symptoms and included bilateral pleural effusions, previously not reported in association with COVID-19. The role of this case report is promotion of potential recognition amongst radiologists of this new disease, which has been declared a global health emergency by the World Health Organization (WHO).

Lin, X., et al. (2020). "Novel Coronavirus Pneumonia Outbreak in 2019: Computed Tomographic Findings in Two Cases." Korean J Radiol **21**(3): 365-368.

Since the 2019 novel coronavirus (2019-nCoV or officially named by the World Health Organization as COVID-19) outbreak in Wuhan, Hubei Province, China in 2019, there have been a few reports of its imaging findings. Here, we report two confirmed cases of 2019-nCoV pneumonia with chest computed tomography findings of multiple regions of patchy consolidation and ground-glass opacities in both lungs. These findings were characteristically located along the bronchial bundle or subpleural lungs.

Lippi, G., et al. (2020). "Potential preanalytical and analytical vulnerabilities in the laboratory diagnosis of coronavirus disease 2019 (COVID-19)." Clin Chem Lab Med.

A novel zoonotic coronavirus outbreak is spreading all over the world. This pandemic disease has now been defined as novel coronavirus disease 2019 (COVID-19), and is sustained by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). As the current gold standard for the etiological diagnosis of SARS-CoV-2 infection is (real time) reverse transcription polymerase chain reaction (rRT-PCR) on respiratory tract specimens, the diagnostic accuracy of this technique shall be considered a foremost prerequisite. Overall, potential RT-PCR vulnerabilities include general preanalytical issues such as identification problems, inadequate procedures for collection, handling, transport and storage of the swabs, collection of inappropriate or inadequate material (for quality or volume), presence of interfering substances, manual errors, as well as specific aspects such as sample contamination and testing patients receiving antiretroviral therapy. Some analytical problems may also contribute to jeopardize the diagnostic accuracy, including testing outside the diagnostic window, active viral recombination, use of inadequately validated assays, insufficient harmonization, instrument malfunctioning, along with other specific technical issues. Some practical indications can hence be identified for minimizing the risk of diagnostic errors, encompassing the improvement of diagnostic accuracy by combining

clinical evidence with results of chest computed tomography (CT) and RT-PCR, interpretation of RT-PCR results according to epidemiologic, clinical and radiological factors, recollection and testing of upper (or lower) respiratory specimens in patients with negative RT-PCR test results and high suspicion or probability of infection, dissemination of clear instructions for specimen (especially swab) collection, management and storage, together with refinement of molecular target (s) and thorough compliance with analytical procedures, including quality assurance.

Liu, S. L. and L. Saif (2020). "Emerging Viruses without Borders: The Wuhan Coronavirus." *Viruses* **12**(2).

The recently emerged coronavirus in Wuhan, China has claimed at least two lives as of January 17 and infected hundreds if not thousands of individuals. The situation has drawn international attention, including from the virology community. We applaud the rapid release to the public of the genome sequence of the new virus by Chinese virologists, but we also believe that increased transparency on disease reporting and data sharing with international colleagues are crucial for curbing the spread of this newly emerging virus to other parts of the world.

Lotfinejad, N., et al. (2020). "Hand hygiene and the novel coronavirus pandemic: The role of healthcare workers." *J Hosp Infect*.

Lu, S., et al. (2020). "Alert for non-respiratory symptoms of Coronavirus Disease 2019 (COVID-19) patients in epidemic period: A case report of familial cluster with three asymptomatic COVID-19 patients." *J Med Virol*.

At present, Coronavirus Disease 2019 (COVID-19) is rampaging around the world. However, asymptomatic carriers intensified the difficulty of prevention and management. Here we reported the screening, clinical features, and treatment process of a family cluster involving three COVID-19 patients. The discovery of the first asymptomatic carrier in this family cluster depends on the repeated and comprehensive epidemiological investigation by disease control experts. In addition, the combination of multiple detection methods can help clinicians find asymptomatic carriers as early as possible. In conclusion, the prevention and control experience of this family cluster showed that comprehensive rigorous epidemiological investigation and combination of multiple detection methods were of great value for the detection of hidden asymptomatic carriers. This article is protected by copyright. All rights reserved.

Lung, J., et al. (2020). "The potential chemical structure of anti-SARS-CoV-2 RNA-dependent RNA polymerase." *J Med Virol*.

An outbreak of coronavirus disease 2019 (COVID-19) occurred in Wuhan and it has rapidly spread to almost all parts of the world. For coronaviruses, RNA-dependent RNA polymerase (RdRp) is an important protease that catalyzes the replication of RNA from RNA template and is an attractive therapeutic target. In this study, we screened these chemical structures from traditional Chinese medicinal compounds proven to show antiviral activity in severe acute respiratory syndrome coronavirus (SARS-CoV) and the similar chemical structures through a molecular docking study to target RdRp of SARS-CoV-2, SARS-CoV, and Middle East respiratory syndrome coronavirus (MERS-CoV). We found that theaflavin has a lower dock score in the catalytic pocket of RdRp in SARS-CoV-2 (-9.11 kcal/mol), SARS-CoV (-8.03 kcal/mol), and MERS-CoV (-8.26 kcal/mol) from dock. To confirm the result, we discovered that theaflavin has lower binding energy of -8.8 kcal/mol when it docks in the catalytic pocket of SARS-CoV-2 RdRp by using the Blind Docking server. Regarding contact modes, hydrophobic interactions contribute significantly in binding and additional hydrogen bonds were found between theaflavin and RdRp. Moreover, one pi-cation interaction was formed between theaflavin and Arg553 from the Blind Docking server. Our results suggest that theaflavin could be a potential SARS-CoV-2 RdRp inhibitor for further study.

Lupia, T., et al. (2020). "2019 novel coronavirus (2019-nCoV) outbreak: A new challenge." *J Glob Antimicrob Resist* **21**: 22-27.

OBJECTIVES: Following the public-health emergency of international concern (PHEIC) declared by the World Health Organization (WHO) on 30 January 2020 and the recent outbreak caused by 2019 novel coronavirus (2019-nCoV) [officially renamed severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)] in China and 29 other countries, we aimed to summarise the clinical aspects of the novel Betacoronavirus disease (COVID-19) and its possible clinical presentations together with suggested therapeutic algorithms for patients who may require antimicrobial treatment. **METHODS:** The currently available literature was reviewed for microbiologically confirmed infections by 2019-nCoV or COVID-19 at the time of writing (13 February 2020). A literature search was performed using the PubMed database and Cochrane Library. Search terms included 'novel coronavirus' or '2019-nCoV' or 'COVID-19'. **RESULTS:** Published cases occurred mostly in males (age range, 8-92 years). Cardiovascular, digestive and

endocrine system diseases were commonly reported, except previous chronic pulmonary diseases [e.g. chronic obstructive pulmonary disease (COPD), asthma, bronchiectasis] that were surprisingly underreported. Fever was present in all of the case series available, flanked by cough, dyspnoea, myalgia and fatigue. Multiple bilateral lobular and subsegmental areas of consolidation or bilateral ground-glass opacities were the main reported radiological features of 2019-nCoV infection, at least in the early phases of the disease. CONCLUSION: The new 2019-nCoV epidemic is mainly associated with respiratory disease and few extrapulmonary signs. However, there is a low rate of associated pre-existing respiratory co-morbidities.

Ma, K., et al. (2020). "[Management and clinical thinking of Coronavirus Disease 2019]." *Zhonghua Gan Zang Bing Za Zhi* **28**(0): E002.

In December 2019, the 2019 novel coronavirus pneumonia (NCP, officially named Coronavirus Disease 2019(COVID-19) by the World Health Organization) broke out in Wuhan, Hubei, and it quickly spread to the whole country and abroad. The situation was at stake. The sudden and serious COVID-19 epidemic has brought us a lot of urgent problems. How to effectively control the spread of COVID-19? When does the population infection rate rise to its peak? What will eventually be the number of infected patients? How to make early diagnosis? What effective antiviral drugs are available? How to effectively treat with existing drugs? Can it successfully improve the survival rate of critically patients? In response to the above questions, we put forward corresponding suggestions and reflections from the perspective of the infectious clinician.

Ma, X. L., et al. (2020). "Management strategies of neonatal jaundice during the coronavirus disease 2019 outbreak." *World J Pediatr*.

The outbreak of coronavirus disease 2019 (COVID-19; formally known as 2019-nCoV) has become a most challenging health emergency. Owing to rigorous quarantine and control measures taken in China, routine neonatal health surveillance and follow-up have become challenging. Without follow-up surveillance, some rapid and progressive newborn diseases, such as bilirubin encephalopathy, may be ignored. The characteristics of onset age of kernicterus suggest that monitoring of bilirubin level at home provides a useful way to alert hospital visits and to prevent the development of extremely hyperbilirubinemia. Therefore, we developed an online follow-up program for convenient monitoring of bilirubin level of newborns that is based on our practical experiences. The aim is to make our

management strategies of neonatal jaundice tailored to the infection prevention and control during the COVID-19 epidemic.

Maffioli, E. M. (2020). "How Is the World Responding to the 2019 Coronavirus Disease Compared with the 2014 West African Ebola Epidemic? The Importance of China as a Player in the Global Economy." *Am J Trop Med Hyg*.

This article describes similarities and differences in the response of governments and the international community to the current 2019 coronavirus disease (COVID-19) and the 2014 West African Ebola epidemic. It expresses the opinion that the speed and scale of the response to the 2019 COVID-19 are affected by the important role that China plays in the global economy. By contrast, insufficient and less timely action was initially undertaken in West African countries during the 2014 Ebola epidemic. It concludes by stating why preparedness for and response to all disease outbreaks, also in countries of lower economic importance, should become a priority in the global health agenda.

Meng, L., et al. (2020). "Coronavirus Disease 2019 (COVID-19): Emerging and Future Challenges for Dental and Oral Medicine." *J Dent Res*: 22034520914246.

The epidemic of coronavirus disease 2019 (COVID-19), originating in Wuhan, China, has become a major public health challenge for not only China but also countries around the world. The World Health Organization announced that the outbreaks of the novel coronavirus have constituted a public health emergency of international concern. As of February 26, 2020, COVID-19 has been recognized in 34 countries, with a total of 80,239 laboratory-confirmed cases and 2,700 deaths. Infection control measures are necessary to prevent the virus from further spreading and to help control the epidemic situation. Due to the characteristics of dental settings, the risk of cross infection can be high between patients and dental practitioners. For dental practices and hospitals in areas that are (potentially) affected with COVID-19, strict and effective infection control protocols are urgently needed. This article, based on our experience and relevant guidelines and research, introduces essential knowledge about COVID-19 and nosocomial infection in dental settings and provides recommended management protocols for dental practitioners and students in (potentially) affected areas.

Meo, S. A., et al. (2020). "Novel coronavirus 2019-nCoV: prevalence, biological and clinical characteristics comparison with SARS-CoV and

MERS-CoV." *Eur Rev Med Pharmacol Sci* **24**(4): 2012-2019.

OBJECTIVE: Human infections with zoonotic coronavirus contain emerging and reemerging pathogenic characteristics which have raised great public health concern. This study aimed at investigating the global prevalence, biological and clinical characteristics of novel coronavirus, Wuhan China (2019-nCoV), Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV), and Middle East Respiratory Syndrome Coronavirus (MERS-CoV) infection outbreaks. **MATERIALS AND METHODS:** The data on the global outbreak of "2019-nCoV, SARS-CoV, and MERS-CoV" were obtained from World Health Organization (WHO), Centers for Disease Control and Prevention (CDC), concerned ministries and research institutes. We also recorded the information from research documents published in global scientific journals indexed in ISI Web of Science and research centers on the prevalence, biological and clinical characteristics of 2019-nCoV, SARS-CoV, and MERS-CoV. **RESULTS:** Worldwide, SARS-CoV involved 32 countries, with 8422 confirmed cases and 916 (10.87%) casualties from November 2002 to August 2003. MERS-CoV spread over 27 states, causing 2496 cases and 868 (34.77%) fatalities during the period April 2012 to December 2019. However, the novel coronavirus 2019-nCoV spread swiftly the global borders of 27 countries. It infected 34799 people and resulted in 724 (2.08%) casualties during the period December 29, 2019 to February 7, 2020. The fatality rate of coronavirus MERS-CoV was (34.77%) higher than SARS-CoV (10.87%) and 2019-nCoV (2.08%); however, the 2019-nCoV transmitted rapidly in comparison to SARS-CoV and MERS-CoV. **CONCLUSIONS:** The novel coronavirus 2019-nCoV has diverse epidemiological and biological characteristics, making it more contagious than SARS-CoV and MERS-CoV. It has affected more people in a short time period compared to SARS-CoV and MERS-CoV, although the fatality rate of MERS-CoV was higher than SARS-CoV and 2019-nCoV. The major clinical manifestations in coronavirus infections 2019-nCoV, MERS-CoV, and SARS CoV are fever, chills, cough, shortness of breath, generalized myalgia, malaise, drowsy, diarrhea, confusion, dyspnea, and pneumonia. Global health authorities should take immediate measures to prevent the outbreaks of such emerging and reemerging pathogens across the globe to minimize the disease burden locally and globally.

multicenter collaboration group of Department of S., et al. (2020). "[Expert consensus on chloroquine phosphate for the treatment of novel coronavirus

pneumonia]." *Zhonghua Jie He He Hu Xi Za Zhi* **43**(3): 185-188.

At the end of December 2019, a novel coronavirus (COVID-19) caused an outbreak in Wuhan, and has quickly spread to all provinces in China and 26 other countries around the world, leading to a serious situation for epidemic prevention. So far, there is still no specific medicine. Previous studies have shown that chloroquine phosphate (chloroquine) had a wide range of antiviral effects, including anti-coronavirus. Here we found that treating the patients diagnosed as novel coronavirus pneumonia with chloroquine might improve the success rate of treatment, shorten hospital stay and improve patient outcome. In order to guide and regulate the use of chloroquine in patients with novel coronavirus pneumonia, the multicenter collaboration group of Department of Science and Technology of Guangdong Province and Health Commission of Guangdong Province for chloroquine in the treatment of novel coronavirus pneumonia developed this expert consensus after extensive discussion. It recommended chloroquine phosphate tablet, 500mg twice per day for 10 days for patients diagnosed as mild, moderate and severe cases of novel coronavirus pneumonia and without contraindications to chloroquine.

multicenter collaboration group of Department of S., et al. (2020). "[Expert consensus on chloroquine phosphate for the treatment of novel coronavirus pneumonia]." *Zhonghua Jie He He Hu Xi Za Zhi* **43**(0): E019.

At the end of December 2019, a novel coronavirus (COVID-19) caused an outbreak in Wuhan, and has quickly spread to all provinces in China and 26 other countries around the world, leading to a serious situation for epidemic prevention. So far, there is still no specific medicine. Previous studies have shown that chloroquine phosphate (chloroquine) had a wide range of antiviral effects, including anti-coronavirus. Here we found that treating the patients diagnosed as novel coronavirus pneumonia with chloroquine might improve the success rate of treatment, shorten hospital stay and improve patient outcome. In order to guide and regulate the use of chloroquine in patients with novel coronavirus pneumonia, the multicenter collaboration group of Department of Science and Technology of Guangdong Province and Health Commission of Guangdong Province for chloroquine in the treatment of novel coronavirus pneumonia developed this expert consensus after extensive discussion. It recommended chloroquine phosphate tablet, 500mg twice per day for 10 days for patients diagnosed as mild, moderate and severe cases of novel coronavirus pneumonia and without contraindications to chloroquine.

Palacios Cruz, M., et al. (2020). "COVID-19, a worldwide public health emergency." *Rev Clin Esp*.

A new coronavirus outbreak emerged on the 31(st) of December 2019 in Wuhan, China, causing commotion among the medical community and the rest of the world. This new species of coronavirus has been termed 2019-nCoV and has caused a considerable number of cases of infection and deaths in China and, to a growing degree, beyond China, becoming a worldwide public health emergency. 2019-nCoV has high homology to other pathogenic coronaviruses, such as those originating from bat-related zoonosis (SARS-CoV), which caused approximately 646 deaths in China at the start of the decade. The mortality rate for 2019-nCoV is not as high (approximately 2-3%), but its rapid propagation has resulted in the activation of protocols to stop its spread. This pathogen has the potential to become a pandemic. It is therefore vital to follow the personal care recommendations issued by the World Health Organisation.

Phan, T. (2020). "Genetic diversity and evolution of SARS-CoV-2." *Infect Genet Evol* **81**: 104260.

COVID-19 is a viral respiratory illness caused by a new coronavirus called SARS-CoV-2. The World Health Organization declared the SARS-CoV-2 outbreak a global public health emergency. We performed genetic analyses of eighty-six complete or near-complete genomes of SARS-CoV-2 and revealed many mutations and deletions on coding and non-coding regions. These observations provided evidence of the genetic diversity and rapid evolution of this novel coronavirus.

Phan, T. (2020). "Novel coronavirus: From discovery to clinical diagnostics." *Infect Genet Evol* **79**: 104211.

A novel coronavirus designated as 2019-nCoV first appeared in Wuhan, China in late December 2019. Dozens of people died in China, and thousands of people infected as 2019-nCoV continues to spread around the world. We have described the discovery, emergence, genomic characteristics, and clinical diagnostics of 2019-nCoV.

Promptchara, E., et al. (2020). "Immune responses in COVID-19 and potential vaccines: Lessons learned from SARS and MERS epidemic." *Asian Pac J Allergy Immunol* **38**(1): 1-9.

As the world is witnessing the epidemic of COVID-19, a disease caused by a novel coronavirus, SARS-CoV-2, emerging genetics and clinical evidences suggest a similar path to those of SARS and MERS. The rapid genomic sequencing and open access data, together with advanced vaccine

technology, are expected to give us more knowledge on the pathogen itself, including the host immune response as well as the plan for therapeutic vaccines in the near future. This review aims to provide a comparative view among SARS-CoV, MERS-CoV and the newly epidemic SARS-CoV-2, in the hope to gain a better understanding of the host-pathogen interaction, host immune responses, and the pathogen immune evasion strategies. This predictive view may help in designing an immune intervention or preventive vaccine for COVID-19 in the near future.

Ren, Y. H., et al. (2020). "[When COVID-19 encounters interstitial lung disease: challenges and management]." *Zhonghua Jie He He Hu Xi Za Zhi* **43**(0): E039.

In December 2019, a new type of coronavirus pneumonia (COVID-19) emerged in Wuhan, Hubei, and spread rapidly to China and over 100 countries around the world. The lung injury and repair caused by COVID-19 has many similarities with the onset and progression of interstitial lung disease (ILD). Therefore, it is difficult to distinguish between COVID-19 and some types of new-onset ILD or other causes leading to acute exacerbation of ILD. Clinicians need to comprehensively analyze the epidemic history, disease onset characteristics, clinical manifestations, image characteristics, serological and pathogenic microorganism test results to confirm diagnosis. Because of this, the article will discuss the issues related to the differential diagnosis and management of COVID-19 and ILD, and try to provide reasonable suggestions.

Repici, A., et al. (2020). "Coronavirus (COVID-19) outbreak: what the department of endoscopy should know." *Gastrointest Endosc*.

Italy recorded its first case of confirmed acute respiratory case due to Coronavirus on February 18, 2020, soon after the initial reports in China. Since that time, Italy and nations throughout the world have adopted very stringent and severe measures to protect populations from spread of infection. Despite these measures, the number of infected people is growing exponentially with a significant number of patients developing acute respiratory insufficiency. Endoscopy departments face significant risk for diffusion of respiratory diseases that can be spread via an airborne route, including aspiration of oral and fecal material via endoscopes. The purpose of this article is to discuss the measures, with specific focus on personal protection equipment and dressing code modalities, which have been implemented in our hospital to prevent further dissemination of COVID-19 infection.

Roussel, Y., et al. (2020). "SARS-CoV-2: fear versus data." *Int J Antimicrob Agents*: 105947.

SARS-CoV-2, the novel coronavirus from China, is spreading around the world, causing a huge reaction despite its current low incidence outside China and the Far East. Four common coronaviruses are in current circulation and cause millions of cases worldwide. This article compares the incidence and mortality rates of these four common coronaviruses with those of SARS-COV-2 in Organisation for Economic Co-operation and Development countries. It is concluded that the problem of SARS-CoV-2 is probably being overestimated, as 2.6 million people die of respiratory infections each year compared with less than 4000 deaths for SARS-CoV-2 at the time of writing.

Salathe, M., et al. (2020). "COVID-19 epidemic in Switzerland: on the importance of testing, contact tracing and isolation." *Swiss Med Wkly* **150**: w20225.

Switzerland is among the countries with the highest number of coronavirus disease-2019 (COVID-19) cases per capita in the world. There are likely many people with undetected SARS-CoV-2 infection because testing efforts are currently not detecting all infected people, including some with clinical disease compatible with COVID-19. Testing on its own will not stop the spread of SARS-CoV-2. Testing is part of a strategy. The World Health Organization recommends a combination of measures: rapid diagnosis and immediate isolation of cases, rigorous tracking and precautionary self-isolation of close contacts. In this article, we explain why the testing strategy in Switzerland should be strengthened urgently, as a core component of a combination approach to control COVID-19.

Salehi, S., et al. (2020). "Coronavirus Disease 2019 (COVID-19): A Systematic Review of Imaging Findings in 919 Patients." *AJR Am J Roentgenol*: 1-7.

OBJECTIVE. Available information on CT features of the 2019 novel coronavirus disease (COVID-19) is scattered in different publications, and a cohesive literature review has yet to be compiled. **MATERIALS AND METHODS.** This article includes a systematic literature search of PubMed, Embase (Elsevier), Google Scholar, and the World Health Organization database. **RESULTS.** Known features of COVID-19 on initial CT include bilateral multilobar ground-glass opacification (GGO) with a peripheral or posterior distribution, mainly in the lower lobes and less frequently within the right middle lobe. Atypical initial imaging presentation of consolidative opacities superimposed on GGO may be found in a smaller number of cases, mainly in the elderly population. Septal thickening, bronchiectasis, pleural thickening, and subpleural involvement are some of the less

common findings, mainly in the later stages of the disease. Pleural effusion, pericardial effusion, lymphadenopathy, cavitation, CT halo sign, and pneumothorax are uncommon but may be seen with disease progression. Follow-up CT in the intermediate stage of disease shows an increase in the number and size of GGOs and progressive transformation of GGO into multifocal consolidative opacities, septal thickening, and development of a crazy paving pattern, with the greatest severity of CT findings visible around day 10 after the symptom onset. Acute respiratory distress syndrome is the most common indication for transferring patients with COVID-19 to the ICU and the major cause of death in this patient population. Imaging patterns corresponding to clinical improvement usually occur after week 2 of the disease and include gradual resolution of consolidative opacities and decrease in the number of lesions and involved lobes. **CONCLUSION.** This systematic review of current literature on COVID-19 provides insight into the initial and follow-up CT characteristics of the disease.

Shen, S. M. (2020). "[Study on issues for stomatological institutions responding to state public health emergencies]." *Zhonghua Kou Qiang Yi Xue Za Zhi* **55**(0): E005.

Crisis management in emergent public health event is a global problem and a difficult thesis for researchers worldwide, highlighted by World Health Organization for its vital importance to public sanitation and health, life quality and survival. This article makes a brief analysis and reflection on the relevant legal issues faced and raised by oral medical institutions and practitioners, taking cases from the emergent crisis caused by COVID-19 in China since December 2019, with the hope to provide legal help and guidance to the oral medical industry in dealing with public health emergencies.

Singhal, T. (2020). "A Review of Coronavirus Disease-2019 (COVID-19)." *Indian J Pediatr* **87**(4): 281-286.

There is a new public health crises threatening the world with the emergence and spread of 2019 novel coronavirus (2019-nCoV) or the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The virus originated in bats and was transmitted to humans through yet unknown intermediary animals in Wuhan, Hubei province, China in December 2019. There have been around 96,000 reported cases of coronavirus disease 2019 (COVID-2019) and 3300 reported deaths to date (05/03/2020). The disease is transmitted by inhalation or contact with infected droplets and the incubation period ranges from 2 to 14 d. The symptoms are usually fever, cough, sore throat,

breathlessness, fatigue, malaise among others. The disease is mild in most people; in some (usually the elderly and those with comorbidities), it may progress to pneumonia, acute respiratory distress syndrome (ARDS) and multi organ dysfunction. Many people are asymptomatic. The case fatality rate is estimated to range from 2 to 3%. Diagnosis is by demonstration of the virus in respiratory secretions by special molecular tests. Common laboratory findings include normal/low white cell counts with elevated C-reactive protein (CRP). The computerized tomographic chest scan is usually abnormal even in those with no symptoms or mild disease. Treatment is essentially supportive; role of antiviral agents is yet to be established. Prevention entails home isolation of suspected cases and those with mild illnesses and strict infection control measures at hospitals that include contact and droplet precautions. The virus spreads faster than its two ancestors the SARS-CoV and Middle East respiratory syndrome coronavirus (MERS-CoV), but has lower fatality. The global impact of this new epidemic is yet uncertain.

Smith, N. and M. Fraser (2020). "Straining the System: Novel Coronavirus (COVID-19) and Preparedness for Concomitant Disasters." Am J Public Health: e1-e2.

Just a few weeks before the first confirmed case of novel coronavirus (COVID-19) was reported in the United States, the US Centers for Disease Control and Prevention (CDC) issued a bold promise to the nation: the agency will use its scientific expertise to bring a new level of preparedness in the United States and global health security against current and growing threats, finally eliminate certain diseases, and bring an end to the devastation of epidemics. (1) The current outbreak of COVID-19 reminds us how urgent this promise is and just how critical it is to continue to sustain and strengthen our nation's public health infrastructure. The unprecedented pace of the public health response to COVID-19 has only been possible because of prior investments in public health preparedness. To accelerate our pace and meet the challenges of current and future health threats, we must advance our world-class data and analytics capabilities; maintain and expand our state-of-the-art public health laboratory capacity; continue building a workforce of trusted, expert, public health professionals; sustain our capacity to rapidly respond to outbreaks at their source; and assure a strong global and domestic preparedness capacity. (Am J Public Health. Published online ahead of print February 13, 2020: e1-e2. doi:10.2105/AJPH.2020.305618).

Sohrabi, C., et al. (2020). "World Health Organization declares global emergency: A review of

the 2019 novel coronavirus (COVID-19)." Int J Surg **76**: 71-76.

An unprecedented outbreak of pneumonia of unknown aetiology in Wuhan City, Hubei province in China emerged in December 2019. A novel coronavirus was identified as the causative agent and was subsequently termed COVID-19 by the World Health Organization (WHO). Considered a relative of severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS), COVID-19 is caused by a betacoronavirus named SARS-CoV-2 that affects the lower respiratory tract and manifests as pneumonia in humans. Despite rigorous global containment and quarantine efforts, the incidence of COVID-19 continues to rise, with 90,870 laboratory-confirmed cases and over 3,000 deaths worldwide. In response to this global outbreak, we summarise the current state of knowledge surrounding COVID-19.

Spiteri, G., et al. (2020). "First cases of coronavirus disease 2019 (COVID-19) in the WHO European Region, 24 January to 21 February 2020." Euro Surveill **25**(9).

In the WHO European Region, COVID-19 surveillance was implemented 27 January 2020. We detail the first European cases. As at 21 February, nine European countries reported 47 cases. Among 38 cases studied, 21 were linked to two clusters in Germany and France, 14 were infected in China. Median case age was 42 years; 25 were male. Late detection of the clusters' index cases delayed isolation of further local cases. As at 5 March, there were 4,250 cases.

Stein, R. (2020). "COVID-19 and Rationally Layered Social Distancing." Int J Clin Pract: e13501.

I would like to thank Dr. Thomson for the very pertinent and relevant points that he raised in his thoughtful letter Where are we now with COVID-19? [1]. As my response will illustrate, and in what probably will become a defining feature of conversations surrounding COVID-19 for quite some time, attempts to answer will only make room for more questions. As COVID-19 is unfolding, every day is marked by novel developments. Since the editorial went to press [2], the outbreak has expanded considerably. Over 128,000 individuals were infected worldwide as of March 13, 2020, leading to 4720 deaths [3]. In early March, while the outbreak in China appeared to start to subside [4], it started to amplify in Europe and the United States. The first fatality in the United States occurred on February 29, 2020 in a suburb of Seattle. On March 4m the first death was reported outside WA state, in CA, and was the 11(th) death in the United States. On March 6, the first two fatalities were reported in Florida. On March 11, 2020,

the World Health Organization declared the outbreak a pandemic [5].

Sun, D., et al. (2020). "Clinical features of severe pediatric patients with coronavirus disease 2019 in Wuhan: a single center's observational study." World J Pediatr.

BACKGROUND: An outbreak of coronavirus disease 2019 (COVID-19) caused by SARS-CoV-2 was first detected in Wuhan, Hubei, China. People of all ages are susceptible to SARS-CoV-2 infection. No information on severe pediatric patients with COVID-19 has been reported. We aimed to describe the clinical features of severe pediatric patients with COVID-19. **METHODS:** We included eight severe or critically ill patients with COVID-19 who were treated at the Intensive Care Unit (ICU), Wuhan Children's Hospital from January 24 to February 24. We collected information including demographic data, symptoms, imaging data, laboratory findings, treatments and clinical outcomes of the patients with severe COVID-19. **RESULTS:** The onset age of the eight patients ranged from 2 months to 15 years; six were boys. The most common symptoms were polypnea (8/8), followed by fever (6/8) and cough (6/8). Chest imaging showed multiple patch-like shadows in seven patients and ground-glass opacity in six. Laboratory findings revealed normal or increased whole blood counts (7/8), increased C-reactive protein, procalcitonin and lactate dehydrogenase (6/8), and abnormal liver function (4/8). Other findings included decreased CD16 + CD56 (4/8) and Th/Ts*(1/8), increased CD3 (2/8), CD4 (4/8) and CD8 (1/8), IL-6 (2/8), IL-10 (5/8) and IFN-gamma (2/8). Treatment modalities were focused on symptomatic and respiratory support. Two critically ill patients underwent invasive mechanical ventilation. Up to February 24, 2020, three patients remained under treatment in ICU, the other five recovered and were discharged home. **CONCLUSIONS:** In this series of severe pediatric patients in Wuhan, polypnea was the most common symptom, followed by fever and cough. Common imaging changes included multiple patch-like shadows and ground-glass opacity; and a cytokine storm was found in these patients, which appeared more serious in critically ill patients.

Sun, P., et al. (2020). "Understanding of COVID-19 based on current evidence." J Med Virol.

Since December 2019, a series of unexplained pneumonia cases have been reported in Wuhan, China. On 12 January 2020, the World Health Organization (WHO) temporarily named this new virus as the 2019 novel coronavirus (2019-nCoV). On 11 February 2020, the WHO officially named the disease caused by the 2019-nCoV as coronavirus disease (COVID-19). The

COVID-19 epidemic is spreading all over the world, especially in China. Based on the published evidence, we systematically discuss the characteristics of COVID-19 in the hope of providing a reference for future studies and help for the prevention and control of the COVID-19 epidemic.

Tan, S. S., et al. (2020). "Practical laboratory considerations amidst the COVID-19 outbreak: early experience from Singapore." J Clin Pathol.

The coronavirus disease 2019 (COVID-19) is a zoonotic viral infection originating from Wuhan, China in December 2019. The World Health Organization has classified this pandemic as a global health emergency due to its virulent nature of transmission, which may lead to acute respiratory distress syndrome. Singapore's health ministry has responded with enhanced surveillance of COVID-19 for all suspected pneumonia cases, further increasing the volume of testing via real-time reverse transcription PCR, as well as samples necessitating stringent infectious control. Collectively, this has implications on the total testing process, laboratory operations and its personnel due to biosafety concerns. Turnaround time for routine testing may also be affected. The aim of this article is to present our tertiary institution's early experience with managing this emerging crisis and offer practical considerations for the preanalytical, analytical and postanalytical phases of laboratory testing in this cohort of patients.

Tetro, J. A. (2020). "Is COVID-19 receiving ADE from other coronaviruses?" Microbes Infect **22**(2): 72-73.

One of the most perplexing questions regarding the current COVID-19 coronavirus epidemic is the discrepancy between the severity of cases observed in the Hubei province of China and those occurring elsewhere in the world. One possible answer is antibody dependent enhancement (ADE) of SARS-CoV-2 due to prior exposure to other coronaviruses. ADE modulates the immune response and can elicit sustained inflammation, lymphopenia, and/or cytokine storm, one or all of which have been documented in severe cases and deaths. ADE also requires prior exposure to similar antigenic epitopes, presumably circulating in local viruses, making it a possible explanation for the observed geographic limitation of severe cases and deaths.

Ton, A. T., et al. (2020). "Rapid Identification of Potential Inhibitors of SARS-CoV-2 Main Protease by Deep Docking of 1.3 Billion Compounds." Mol Inform.

The recently emerged 2019 Novel Coronavirus (SARS-CoV-2) and associated COVID-19 disease

cause serious or even fatal respiratory tract infection and yet no approved therapeutics or effective treatment is currently available to effectively combat the outbreak. This urgent situation is pressing the world to respond with the development of novel vaccine or a small molecule therapeutics for SARS-CoV-2. Along these efforts, the structure of SARS-CoV-2 main protease (Mpro) has been rapidly resolved and made publicly available to facilitate global efforts to develop novel drug candidates. Recently, our group has developed a novel deep learning platform - Deep Docking (DD) which provides fast prediction of docking scores of Glide (or any other docking program) and, hence, enables structure-based virtual screening of billions of purchasable molecules in a short time. In the current study we applied DD to all 1.3 billion compounds from ZINC15 library to identify top 1,000 potential ligands for SARS-CoV-2 Mpro protein. The compounds are made publicly available for further characterization and development by scientific community.

Ung, C. O. L. (2020). "Community pharmacist in public health emergencies: Quick to action against the coronavirus 2019-nCoV outbreak." *Res Social Adm Pharm* **16**(4): 583-586.

The 2019-nCoV infection that is caused by a novel strain of coronavirus was first detected in China in the end of December 2019 and declared a public health emergency of international concern by the World Health Organization on January 30, 2020. Community pharmacists in one of the first areas that had confirmed cases of the viral infection, Macau, joined the collaborative force in supporting the local health emergency preparedness and response arrangements. This paper aimed to improve the understanding of community pharmacists' role in case of 2019-CoV outbreak based on the practical experiences in consultation with the recommendations made by the International Pharmaceutical Federation on the Coronavirus 2019-nCoV outbreak.

Wan, Y., et al. (2020). "Receptor Recognition by the Novel Coronavirus from Wuhan: an Analysis Based on Decade-Long Structural Studies of SARS Coronavirus." *J Virol* **94**(7).

Recently, a novel coronavirus (2019-nCoV) has emerged from Wuhan, China, causing symptoms in humans similar to those caused by severe acute respiratory syndrome coronavirus (SARS-CoV). Since the SARS-CoV outbreak in 2002, extensive structural analyses have revealed key atomic-level interactions between the SARS-CoV spike protein receptor-binding domain (RBD) and its host receptor angiotensin-converting enzyme 2 (ACE2), which regulate both the cross-species and human-to-human

transmissions of SARS-CoV. Here, we analyzed the potential receptor usage by 2019-nCoV, based on the rich knowledge about SARS-CoV and the newly released sequence of 2019-nCoV. First, the sequence of 2019-nCoV RBD, including its receptor-binding motif (RBM) that directly contacts ACE2, is similar to that of SARS-CoV, strongly suggesting that 2019-nCoV uses ACE2 as its receptor. Second, several critical residues in 2019-nCoV RBM (particularly Gln493) provide favorable interactions with human ACE2, consistent with 2019-nCoV's capacity for human cell infection. Third, several other critical residues in 2019-nCoV RBM (particularly Asn501) are compatible with, but not ideal for, binding human ACE2, suggesting that 2019-nCoV has acquired some capacity for human-to-human transmission. Last, while phylogenetic analysis indicates a bat origin of 2019-nCoV, 2019-nCoV also potentially recognizes ACE2 from a diversity of animal species (except mice and rats), implicating these animal species as possible intermediate hosts or animal models for 2019-nCoV infections. These analyses provide insights into the receptor usage, cell entry, host cell infectivity and animal origin of 2019-nCoV and may help epidemic surveillance and preventive measures against 2019-nCoV. **IMPORTANCE** The recent emergence of Wuhan coronavirus (2019-nCoV) puts the world on alert. 2019-nCoV is reminiscent of the SARS-CoV outbreak in 2002 to 2003. Our decade-long structural studies on the receptor recognition by SARS-CoV have identified key interactions between SARS-CoV spike protein and its host receptor angiotensin-converting enzyme 2 (ACE2), which regulate both the cross-species and human-to-human transmissions of SARS-CoV. One of the goals of SARS-CoV research was to build an atomic-level iterative framework of virus-receptor interactions to facilitate epidemic surveillance, predict species-specific receptor usage, and identify potential animal hosts and animal models of viruses. Based on the sequence of 2019-nCoV spike protein, we apply this predictive framework to provide novel insights into the receptor usage and likely host range of 2019-nCoV. This study provides a robust test of this reiterative framework, providing the basic, translational, and public health research communities with predictive insights that may help study and battle this novel 2019-nCoV.

Wang, C., et al. (2020). "The establishment of reference sequence for SARS-CoV-2 and variation analysis." *J Med Virol*.

Starting around December 2019, an epidemic of pneumonia, which was named COVID-19 by the World Health Organization, broke out in Wuhan, China, and is spreading throughout the world. A new coronavirus, named severe acute respiratory syndrome

coronavirus 2 (SARS-CoV-2) by the Coronavirus Study Group of the International Committee on Taxonomy of Viruses was soon found to be the cause. At present, the sensitivity of clinical nucleic acid detection is limited, and it is still unclear whether it is related to genetic variation. In this study, we retrieved 95 full-length genomic sequences of SARS-CoV-2 strains from the National Center for Biotechnology Information and GISAID databases, established the reference sequence by conducting multiple sequence alignment and phylogenetic analyses, and analyzed sequence variations along the SARS-CoV-2 genome. The homology among all viral strains was generally high, among them, 99.99% (99.91%-100%) at the nucleotide level and 99.99% (99.79%-100%) at the amino acid level. Although overall variation in open-reading frame (ORF) regions is low, 13 variation sites in 1a, 1b, S, 3a, M, 8, and N regions were identified, among which positions nt28144 in ORF 8 and nt8782 in ORF 1a showed mutation rate of 30.53% (29/95) and 29.47% (28/95), respectively. These findings suggested that there may be selective mutations in SARS-CoV-2, and it is necessary to avoid certain regions when designing primers and probes. Establishment of the reference sequence for SARS-CoV-2 could benefit not only biological study of this virus but also diagnosis, clinical monitoring and intervention of SARS-CoV-2 infection in the future.

Wang, L. S., et al. (2020). "A review of the 2019 Novel Coronavirus (COVID-19) based on current evidence." *Int J Antimicrob Agents*: 105948.

The pneumonia caused by novel coronavirus (SARS-CoV-2) in Wuhan, China in December 2019 is a highly contagious disease. The World Health Organization (WHO) has declared the ongoing outbreak as a global public health emergency. Currently, the research on novel coronavirus is still in the primary stage. Based on the current published evidence, we systematically summarize the epidemiology, clinical characteristics, diagnosis, treatment and prevention of knowledge surrounding COVID-19. This review in the hope of helping the public effectively recognize and deal with the 2019 novel coronavirus (SARS-CoV-2), and providing a reference for future studies.

Wang, X., et al. (2020). "Challenges to the system of reserve medical supplies for public health emergencies: reflections on the outbreak of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) epidemic in China." *Biosci Trends* **14**(1): 3-8.

On December 31, 2019, the Wuhan Municipal Health Commission announced an outbreak of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), China is now at a critical period in the control

of the epidemic. The Chinese Government has been taking a series of rapid, comprehensive, and effective prevention and control measures. As the pandemic has developed, a fact has become apparent: there is a serious dearth of emergency medical supplies, and especially an extreme shortage of personal protective equipment such as masks and medical protective clothing. This is one of the major factors affecting the progress of epidemic prevention and control. Although China has made great efforts to strengthen the ability to quickly respond to public health emergencies since the SARS outbreak in 2003 and it has clarified requirements for emergency supplies through legislation, the emergency reserve supplies program has not been effectively implemented, and there are also deficiencies in the types, quantity, and availability of emergency medical supplies. A sound system of emergency reserve supplies is crucial to the management of public health emergencies. Based on international experiences with pandemic control, the world should emphasize improving the system of emergency reserve medical supplies in the process of establishing and improving public health emergency response systems, and it should promote the establishment of international cooperative programs to jointly deal with public health emergencies of international concern in the future.

Wax, R. S. and M. D. Christian (2020). "Practical recommendations for critical care and anesthesiology teams caring for novel coronavirus (2019-nCoV) patients." *Can J Anaesth*.

A global health emergency has been declared by the World Health Organization as the 2019-nCoV outbreak spreads across the world, with confirmed patients in Canada. Patients infected with 2019-nCoV are at risk for developing respiratory failure and requiring admission to critical care units. While providing optimal treatment for these patients, careful execution of infection control measures is necessary to prevent nosocomial transmission to other patients and to healthcare workers providing care. Although the exact mechanisms of transmission are currently unclear, human-to-human transmission can occur, and the risk of airborne spread during aerosol-generating medical procedures remains a concern in specific circumstances. This paper summarizes important considerations regarding patient screening, environmental controls, personal protective equipment, resuscitation measures (including intubation), and critical care unit operations planning as we prepare for the possibility of new imported cases or local outbreaks of 2019-nCoV. Although understanding of the 2019-nCoV virus is evolving, lessons learned from prior infectious disease challenges such as Severe Acute Respiratory Syndrome will hopefully improve

our state of readiness regardless of the number of cases we eventually manage in Canada.

Weston, S. and M. B. Frieman (2020). "COVID-19: Knowns, Unknowns, and Questions." *mSphere* **5**(2).

The recent emergence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) from the Hubei province in China in late 2019 demonstrates the epidemic potential of coronaviruses. The rapid spread of this virus across the world in only 2 months highlights the transmissibility of this family of viruses and the significant morbidity and mortality that they can cause. We highlight the current state of knowledge of coronavirus biology while answering questions concerning the current outbreak of SARS-CoV-2.

Wujtewicz, M., et al. (2020). "COVID-19 - what should anaesthesiologists and intensivists know about it?" *Anaesthesiol Intensive Ther* **52**(1): 34-41.

Over the past three months, the world has faced an unprecedented health hazard. The World Health Organization has announced a pandemic infection with an unknown species of coronavirus called SARS-CoV-2. Spreading mainly through the droplet route, the virus causes mild symptoms in the majority of cases, the most common being: fever (80%), dry cough (56%), fatigue (22%) and muscle pain (7%); less common symptoms include a sore throat, a runny nose, diarrhea, hemoptysis and chills. A life-threatening complication of SARS-CoV-2 infection is an acute respiratory distress syndrome (ARDS), which occurs more often in older adults, those with immune disorders and co-morbidities. Severe forms of the infection, being an indication for treatment in the intensive care unit, comprise acute lung inflammation, ARDS, sepsis and septic shock. The article presents basic information about etiology, pathogenesis and diagnostics (with particular emphasis on the importance of tomocomputer imaging), clinical picture, treatment and prevention of the infection. It goes on to emphasize the specific risks of providing anesthesiology and intensive care services. Due to the fact that effective causal treatment is not yet available and the number of infections and deaths increases day by day, infection prevention and strict adherence to recommendations of infection control organizations remain the basis for fighting the virus.

Xu, J., et al. (2020). "Systematic Comparison of Two Animal-to-Human Transmitted Human Coronaviruses: SARS-CoV-2 and SARS-CoV." *Viruses* **12**(2).

After the outbreak of the severe acute respiratory syndrome (SARS) in the world in 2003, human coronaviruses (HCoV) have been reported as

pathogens that cause severe symptoms in respiratory tract infections. Recently, a new emerged HCoV isolated from the respiratory epithelium of unexplained pneumonia patients in the Wuhan seafood market caused a major disease outbreak and has been named the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). This virus causes acute lung symptoms, leading to a condition that has been named as "coronavirus disease 2019" (COVID-19). The emergence of SARS-CoV-2 and of SARS-CoV caused widespread fear and concern and has threatened global health security. There are some similarities and differences in the epidemiology and clinical features between these two viruses and diseases that are caused by these viruses. The goal of this work is to systematically review and compare between SARS-CoV and SARS-CoV-2 in the context of their virus incubation, originations, diagnosis and treatment methods, genomic and proteomic sequences, and pathogenic mechanisms.

Yang, H. Y. and G. C. Duan (2020). "[Analysis on the epidemic factors for the Corona Virus Disease]." *Zhonghua Yu Fang Yi Xue Za Zhi* **54**(0): E021.

Since December 2019, corona virus disease 2019 (COVID-19), an emerging infection disease occurred in Wuhan, has spread in the mainland China. The epidemic factors on the basis of knowledge of SARS-CoV-2 were discussed in this paper. This puts a lot of pressure on clinical resources and care. SARS-CoV-2 is a novel corona virus, the onset of COVID-19 is slow, and the pathogenesis of SARS-CoV-2 remains unclear and may lead to multiple organ damage. These put a lot of pressure on clinical resources and care. Source of infection including the patients, asymptomatic carrier and patients in the incubation period are contagious. It is difficult to control source of infection. Routes of SARS-CoV-2 transmission are diversified and the main routes of transmission for COVID-19 are droplet transmission and close contact transmission. All population have susceptibility to SARS-CoV-2. Social factors such population movements and aggregation accelerated the spread of SARS-CoV-2. The Chinese government's adopted measures are positive and effective, and are accepted by the expert group from the World Health Organization. However, it will be a long-term hard work in the future to seriously summarize and think deeply to achieve public health security in China.

Yang, Y., et al. (2020). "The deadly coronaviruses: The 2003 SARS pandemic and the 2020 novel coronavirus epidemic in China." *J Autoimmun*: 102434.

The 2019-nCoV is officially called SARS-CoV-2 and the disease is named COVID-19. This viral epidemic in China has led to the deaths of over 1800 people, mostly elderly or those with an underlying chronic disease or immunosuppressed state. This is the third serious Coronavirus outbreak in less than 20 years, following SARS in 2002-2003 and MERS in 2012. While human strains of Coronavirus are associated with about 15% of cases of the common cold, the SARS-CoV-2 may present with varying degrees of severity, from flu-like symptoms to death. It is currently believed that this deadly Coronavirus strain originated from wild animals at the Huanan market in Wuhan, a city in Hubei province. Bats, snakes and pangolins have been cited as potential carriers based on the sequence homology of CoV isolated from these animals and the viral nucleic acids of the virus isolated from SARS-CoV-2 infected patients. Extreme quarantine measures, including sealing off large cities, closing borders and confining people to their homes, were instituted in January 2020 to prevent spread of the virus, but by that time much of the damage had been done, as human-human transmission became evident. While these quarantine measures are necessary and have prevented a historical disaster along the lines of the Spanish flu, earlier recognition and earlier implementation of quarantine measures may have been even more effective. Lessons learned from SARS resulted in faster determination of the nucleic acid sequence and a more robust quarantine strategy. However, it is clear that finding an effective antiviral and developing a vaccine are still significant challenges. The costs of the epidemic are not limited to medical aspects, as the virus has led to significant sociological, psychological and economic effects globally. Unfortunately, emergence of SARS-CoV-2 has led to numerous reports of Asians being subjected to racist behavior and hate crimes across the world.

Ye, Z., et al. (2020). "Chest CT manifestations of new coronavirus disease 2019 (COVID-19): a pictorial review." *Eur Radiol*.

Coronavirus disease 2019 (COVID-19) outbreak, first reported in Wuhan, China, has rapidly swept around the world just within a month, causing global public health emergency. In diagnosis, chest computed tomography (CT) manifestations can supplement parts of limitations of real-time reverse transcription polymerase chain reaction (RT-PCR) assay. Based on a comprehensive literature review and the experience in the frontline, we aim to review the typical and relatively atypical CT manifestations with representative COVID-19 cases at our hospital, and hope to strengthen the recognition of these features with radiologists and help them make a quick and

accurate diagnosis. Key Points * Ground glass opacities, consolidation, reticular pattern, and crazy paving pattern are typical CT manifestations of COVID-19. * Emerging atypical CT manifestations, including airway changes, pleural changes, fibrosis, nodules, etc., were demonstrated in COVID-19 patients. * CT manifestations may associate with the progression and prognosis of COVID-19.

Yu, F., et al. (2020). "Measures for diagnosing and treating infections by a novel coronavirus responsible for a pneumonia outbreak originating in Wuhan, China." *Microbes Infect* **22**(2): 74-79.

On 10 January 2020, a new coronavirus causing a pneumonia outbreak in Wuhan City in central China was denoted as 2019-nCoV by the World Health Organization (WHO). As of 24 January 2020, there were 887 confirmed cases of 2019-nCoV infection, including 26 deaths, reported in China and other countries. Therefore, combating this new virus and stopping the epidemic is a matter of urgency. Here, we focus on advances in research and development of fast diagnosis methods, as well as potential prophylactics and therapeutics to prevent or treat 2019-nCoV infection.

Yu, H., et al. (2020). "Reverse Logistics Network Design for Effective Management of Medical Waste in Epidemic Outbreaks: Insights from the Coronavirus Disease 2019 (COVID-19) Outbreak in Wuhan (China)." *Int J Environ Res Public Health* **17**(5).

The outbreak of an epidemic disease may pose significant threats to human beings and may further lead to a global crisis. In order to control the spread of an epidemic, the effective management of rapidly increased medical waste through establishing a temporary reverse logistics system is of vital importance. However, no research has been conducted with the focus on the design of an epidemic reverse logistics network for dealing with medical waste during epidemic outbreaks, which, if improperly treated, may accelerate disease spread and pose a significant risk for both medical staffs and patients. Therefore, this paper proposes a novel multi-objective multi-period mixed integer program for reverse logistics network design in epidemic outbreaks, which aims at determining the best locations of temporary facilities and the transportation strategies for effective management of the exponentially increased medical waste within a very short period. The application of the model is illustrated with a case study based on the outbreak of the coronavirus disease 2019 (COVID-19) in Wuhan, China. Even though the uncertainty of the future COVID-19 spread tendency is very high at the time of this research, several general policy recommendations can still be obtained based on

computational experiments and quantitative analyses. Among other insights, the results suggest installing temporary incinerators may be an effective solution for managing the tremendous increase of medical waste during the COVID-19 outbreak in Wuhan, but the location selection of these temporary incinerators is of significant importance. Due to the limitation on available data and knowledge at present stage, more real-world information are needed to assess the effectiveness of the current solution.

Zhang, H. F., et al. (2020). "Response of Chinese Anesthesiologists to the COVID-19 Outbreak." Anesthesiology.

The coronavirus disease 2019, named COVID-19 officially by the World Health Organization (Geneva, Switzerland) on February 12, 2020, has spread at unprecedented speed. After the first outbreak in Wuhan, China, Chinese anesthesiologists encountered increasing numbers of infected patients since December 2019. Because the main route of transmission is via respiratory droplets and close contact, anesthesia providers are at a high risk when responding to the devastating mass emergency. So far, actions have been taken including but not limited to nationwide actions and online education regarding special procedures of airway management, oxygen therapy, ventilation support, hemodynamic management, sedation, and analgesia. As the epidemic situation has lasted for months (thus far), special platforms have also been set up to provide free mental health care to all anesthesia providers participating in acute and critical caring for COVID-19 patients. The current article documents the actions taken, lesson learned, and future work needed.

Zhang, W., et al. (2020). "Molecular and serological investigation of 2019-nCoV infected patients: implication of multiple shedding routes." Emerg Microbes Infect 9(1): 386-389.

In December 2019, a novel coronavirus (2019-nCoV) caused an outbreak in Wuhan, China, and soon spread to other parts of the world. It was believed that 2019-nCoV was transmitted through respiratory tract and then induced pneumonia, thus molecular diagnosis based on oral swabs was used for confirmation of this disease. Likewise, patient will be released upon two times of negative detection from oral swabs. However, many coronaviruses can also be transmitted through oral-fecal route by infecting intestines. Whether 2019-nCoV infected patients also carry virus in other organs like intestine need to be tested. We conducted investigation on patients in a local hospital who were infected with this virus. We found the presence of 2019-nCoV in anal swabs and blood as well, and more anal swab positives than oral swab positives in a later

stage of infection, suggesting shedding and thereby transmitted through oral-fecal route. We also showed serology test can improve detection positive rate thus should be used in future epidemiology. Our report provides a cautionary warning that 2019-nCoV may be shed through multiple routes.

Zhao, D., et al. (2020). "A comparative study on the clinical features of COVID-19 pneumonia to other pneumonias." Clin Infect Dis.

BACKGROUND: A novel coronavirus (2019-nCoV) has raised world concern since it emerged in Wuhan Hubei China in December, 2019. The infection may result into severe pneumonia with clusters illness onsets. Its impacts on public health make it paramount to clarify the clinical features with other pneumonias. METHODS: Nineteen 2019-nCoV pneumonia (NCOVID-19) and fifteen other pneumonia patients (NON-NCOVID-19) in out of Hubei places were involved in this study. Both NCOVID-19 and NON-NCOVID-19 patients were confirmed to be infected in throat swabs or/and sputa with or without 2019-nCoV by real-time RT-PCR. We analyzed the demographic, epidemiological, clinical, and radiological features from those patients, and compared the difference between NCOVID-19 and NON-NCOVID-19. RESULTS: All patients had a history of exposure to confirmed case of 2019-nCoV or travel to Hubei before illness. The median duration, respectively, was 8 (IQR:6~11) and 5 (IQR:4~11) days from exposure to onset in NCOVID-19 and NON-NCOVID-19. The clinical symptoms were similar between NCOVID-19 and NON-NCOVID-19. The most common symptoms were fever and cough. Fifteen (78.95%) NCOVID-19 but 4 (26.67%) NON-NCOVID-19 patients had bilateral involvement while 17 (89.47%) NCOVID-19 but 1 (6.67%) NON-NCOVID-19 patients had multiple mottling and ground-glass opacity of chest CT images. Compared to NON-NCOVID-19, NCOVID-19 present remarkably more abnormal laboratory tests including AST, ALT, gamma-GT, LDH and alpha-HBDH. CONCLUSION: The 2019-nCoV infection caused similar onsets to other pneumonias. CT scan may be a reliable test for screening NCOVID-19 cases. Liver function damage is more frequent in NCOVID-19 than NON-NCOVID-19 patients. LDH and alpha-HBDH may be considerable markers for evaluation of NCOVID-19.

Zheng, Y. and W. Lai (2020). "Dermatology staff participate in fight against Covid-19 in China." J Eur Acad Dermatol Venereol.

In December, 2019, a series of pneumonia cases in Wuhan, China, was caused by a novel coronavirus (Covid-19) [1-2], has become a global health concern [3]. At present the epidemic in China has been well

controlled, but Covid-19 are currently spreading in many other countries all over the world. Dermatologists in China have participated in the fight against Covid-19. In this paper we share our experiences in dealing with skin diseases in this special period and hope to provide some references for international colleagues in the epidemic situation.

The above contents are the collected information from Internet and public resources to offer to the people for the convenient reading and information disseminating and sharing.

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