

## Abstract

**INTRODUCTION:**

To review the present literature on upper respiratory tract sampling in COVID-19 and provide recommendations to improve healthcare practices and directions in future studies.

**METHODS:**

Twelve relevant manuscripts were sourced from a total of 7288 search results obtained using PubMed, Medline and Google Scholar. The search keywords used were COVID-19, nasopharyngeal, oropharyngeal, swabs, SARS and CoV2. Original manuscripts were obtained and analysed by all authors. The review included manuscripts which have not undergone rigorous peer-review process in view of the magnitude of the topic discussed.

**RESULTS:**

The viral load of SARS-CoV-2 RNA in the upper respiratory tract was significantly higher during the first week and peaked at 4-6 days after onset of symptoms, during which it can be potentially sampled. Nasopharyngeal swab has demonstrated higher viral load than oropharyngeal swab, where the difference in paired samples is best seen at 0-9 days after the onset of illness. Sensitivity of nasopharyngeal swab was higher than oropharyngeal swabs in COVID-19 patients. Patient self-collected throat washing has been shown to contain higher viral load than nasopharyngeal or oropharyngeal swab, with significantly higher sensitivity when compared with paired nasopharyngeal swab.

**RECOMMENDATIONS:**

Routine nasopharyngeal swab of suspected COVID-19 infection should take anatomy of the nasal cavity into consideration to increase patient comfort and diagnostic yield. Routine oropharyngeal swab should be replaced by throat washing which has demonstrated better diagnostic accuracy, and it is safe towards others.

PMID: 32342928

2. Malays J Pathol. 2020 Apr;42(1):13-21.

**Diagnostic performance of COVID-19 serology assays.**

[Zainol Rashid Z<sup>1</sup>](#), [Othman SN](#), [Abdul Samat MN](#), [Ali UK](#), [Wong KK](#).

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**Abstract****INTRODUCTION:**

The World Health Organization (WHO) declared COVID-19 outbreak as a world pandemic on 12th March 2020. Diagnosis of suspected cases is confirmed by nucleic acid assays with real-time PCR, using respiratory samples. Serology tests are comparatively easier to perform, but their utility may be limited by the performance and the fact that antibodies appear later during the disease course. We aimed to describe the performance data on serological assays for COVID-19.

**MATERIALS AND METHODS:**

A review of multiple reports and kit inserts on the diagnostic performance of rapid tests from various manufacturers that are commercially available were performed. Only preliminary data are available currently.

## RESULTS:

From a total of nine rapid detection test (RDT) kits, three kits offer total antibody detection, while six kits offer combination SARS-CoV-2 IgM and IgG detection in two separate test lines. All kits are based on colloidal gold-labeled immunochromatography principle and one-step method with results obtained within 15 minutes, using whole blood, serum or plasma samples. The sensitivity for both IgM and IgG tests ranges between 72.7% and 100%, while specificity ranges between 98.7% to 100%. Two immunochromatography using nasopharyngeal or throat swab for detection of COVID-19 specific antigen are also reviewed.

## CONCLUSIONS:

There is much to determine regarding the value of serological testing in COVID-19 diagnosis and monitoring. More comprehensive evaluations of their performance are rapidly underway. The use of serology methods requires appropriate interpretations of the results and understanding the strengths and limitations of such tests.

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3. Malays J Pathol. 2020 Apr;42(1):3-11.

### Properties of Coronavirus and SARS-CoV-2.

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## Abstract

were identified beginning with the discovery of SARS-CoV in 2002. With the recent detection of SARS-CoV-2, there are now seven human coronaviruses. Those that cause mild diseases are the 229E, OC43, NL63 and HKU1, and the pathogenic species are SARS-CoV, MERS-CoV and SARS-CoV-2. Coronaviruses (order Nidovirales, family Coronaviridae, and subfamily Orthocoronavirinae) are spherical (125nm diameter), and enveloped with club-shaped spikes on the surface giving the appearance of a solar corona. Within the helically symmetrical nucleocapsid is the large positive sense, single stranded RNA. Of the four coronavirus genera ( $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ ), human coronaviruses (HCoVs) are classified under  $\alpha$ -CoV (HCoV-229E and NL63) and  $\beta$ -CoV (MERS-CoV, SARS-CoV, HCoV-OC43 and HCoV-HKU1). SARS-CoV-2 is a  $\beta$ -CoV and shows fairly close relatedness with two bat-derived CoV-like coronaviruses, bat-SL-CoVZC45 and bat-SL-CoVZXC21. Even so, its genome is similar to that of the typical CoVs. SARS-CoV and MERS-CoV originated in bats, and it appears to be so for SARS-CoV-2 as well. The possibility of an intermediate host facilitating the emergence of the virus in humans has already been shown with civet cats acting as intermediate hosts for SARS-CoVs, and dromedary camels for MERS-CoV. Human-to-human transmission is primarily achieved through close contact of respiratory droplets, direct contact with the infected individuals, or by contact with contaminated objects and surfaces. The coronaviral genome contains four major structural proteins: the spike (S), membrane (M), envelope (E) and the nucleocapsid (N) protein, all of which are encoded within the 3' end of the genome. The S protein mediates attachment of the virus to the host cell surface receptors resulting in fusion and subsequent viral entry. The M protein is the most abundant protein and defines the shape of the viral envelope. The E protein is the smallest of the major structural proteins and participates in viral assembly and budding. The N protein is the only one that binds to the RNA genome and is also involved in viral assembly and budding. Replication of coronaviruses begin with attachment and entry. Attachment of the virus to the host cell is initiated by interactions between the S protein and its specific receptor. Following receptor binding, the virus enters host cell cytosol via cleavage of S protein by a protease enzyme, followed by fusion of the viral and cellular membranes. The next step is the translation of the replicase gene from the virion genomic RNA and then translation and assembly of the viral replicase complexes. Following replication and subgenomic RNA synthesis, encapsidation occurs resulting in the formation of the mature virus. Following assembly, virions are transported to the cell surface in vesicles and released by exocytosis.

PMID: 32342927



4. Malays J Pathol. 2020 Apr;42(1):1.

### **Challenges of Covid-19 testing.**

[Tan GC<sup>1</sup>](#), [Cheong SK](#).

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[@ppukm.ukm.edu.my](#).

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No abstract available.

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### **Thoughts on COVID-19 and autoimmune diseases.**

[Askanase AD<sup>1</sup>](#), [Khalili L<sup>1</sup>](#), [Buyon JP<sup>2</sup>](#).

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1. Department of Rheumatology, Columbia University Medical Center, New York, New York, USA.

2. Department of Rheumatology, NYU Langone Health, New York, New York, USA.

### **Abstract**

Over the 2 months since coronavirus first appeared in China, cases have emerged on every continent, and it is clear that patients with autoimmune diseases might also be affected. Coronavirus disease 2019 (COVID-19) is a highly contagious viral illness with a mortality rate approaching 2%. Here we discuss the challenges that patients with autoimmune diseases might face and the information on using immunomodulatory therapies like chloroquine, tocilizumab and baricitinib to quench the cytokine storm in patients with very severe COVID-19 pneumonia.

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Competing interests: None declared.

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### **Correction: Contributions and challenges of general practitioners in China fighting against the novel coronavirus crisis.**

[No authors listed]



**Erratum for**

- [Contributions and challenges of general practitioners in China fighting against the novel coronavirus crisis](#). [Fam Med Community Health. 2020]

**Abstract**

[This corrects the article DOI: 10.1136/fmch-2020-000361.].

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**[A retrospective cohort study of methylprednisolone therapy in severe patients with COVID-19 pneumonia.](#)**

[Wang Y<sup>1</sup>](#), [Jiang W<sup>2</sup>](#), [He Q<sup>2</sup>](#), [Wang C<sup>3</sup>](#), [Wang B<sup>4</sup>](#), [Zhou P<sup>5</sup>](#), [Dong N<sup>6</sup>](#), [Tong Q<sup>7</sup>](#).

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[Slaughter MS<sup>1</sup>](#).

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### **Quo vadis after COVID-19: a new path for global emergency preparedness?**

[Khetrapal Singh P<sup>1</sup>](#), [Ofrin RH<sup>2</sup>](#).

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2. Regional Emergency Director, WHO Health Emergencies Programme WHO Regional Office for South-East Asia, New Delhi, India.

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### **Suspected cases of COVID-19: study protocol for reporting characteristics and the outcomes.**

[Hamed E<sup>1</sup>](#), [Abd Elhamid M<sup>2</sup>](#), [Alemrayat B<sup>2</sup>](#).

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Competing interests: Kindly note that we added BA as a coauthor in your study following the review and approval of all authors.

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### **Covid-19: Leading statistician slams UK's reporting of swab tests as "travesty of science".**

[Wise J<sup>1</sup>](#).

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1. London.

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### **Mourning our dead in the covid-19 pandemic.**

[O'Mahony S](#)<sup>1</sup>.

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1. Centre for the Humanities and Health, King's College London, UK.

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[Agius RM](#)<sup>1</sup>.

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### **Mitigating the wider health effects of covid-19 pandemic response.**

[Douglas M](#)<sup>1,2</sup>, [Katikireddi SV](#)<sup>2,3</sup>, [Taulbut M](#)<sup>2</sup>, [McKee M](#)<sup>4</sup>, [McCartney G](#)<sup>2</sup>.



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7. Access to Medicines and Health Products Division, World Health Organization, Geneva, Switzerland.
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### **Managing patients with rheumatic conditions during the covid-19 pandemic.**

[Caporali R](#)<sup>1</sup>, [Favalli EG](#)<sup>1</sup>.

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[Mamo J](#)<sup>1</sup>, [Feroz B](#)<sup>1</sup>, [Mahmood S](#)<sup>1</sup>.

Author information:

1. Department of Neurorehabilitation, Royal Berkshire Hospital, Reading RG1 5AN, UK.

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#### **Pathology of 2019 Novel Coronavirus Pneumonia: A Dynamic Disease Process.**

[Tian S<sup>1</sup>](#), [Xiao SY<sup>2</sup>](#).

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2. Department of Pathology, Zhongnan Hospital of Wuhan University, Wuhan, People's Republic of China; Department of Pathology, University of Chicago Medicine, Chicago, Illinois. Electronic address: [\(10\)\(2e\)@uchicago.edu](#).

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[Baldwin P](#).

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### On the Pharmacy Radar: COVID-19 and Older People.

[Alderman C.](#)

#### **Abstract**

The COVID-19 pandemic presents many medical and social issues for older people. Presented here is a range of information arising from related areas that have impact upon the safety and efficacy of drug therapy in the context of COVID-19. Issues include pharmacy practice, clinical therapeutics, and possible new treatments for the virus. More information will be published in coming issues of *The Senior Care Pharmacist*.

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24. J Otolaryngol Head Neck Surg. 2020 Apr 27;49(1):23. doi: 10.1186/s40463-020-00414-9.

### Recommendations from the CSO-HNS taskforce on performance of tracheotomy during the COVID-19 pandemic.

[Sommer DD<sup>1</sup>](#), [Engels PT<sup>2</sup>](#), [Usaf CEKW<sup>3</sup>](#), [Khalili S<sup>4</sup>](#), [Corsten M<sup>5</sup>](#), [Tewfik MA<sup>6</sup>](#), [Fung K<sup>7</sup>](#), [Cote D<sup>8</sup>](#), [Gupta M<sup>9</sup>](#), [Sne N<sup>2</sup>](#), [Brown TFE<sup>5</sup>](#), [Paul J<sup>10</sup>](#), [Kost KM<sup>6</sup>](#), [Witterick IJ<sup>11</sup>](#).

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#### **Abstract**

#### **INTRODUCTION:**

The performance of tracheotomy is a common procedural request by critical care departments to the surgical services of general surgery, thoracic surgery and otolaryngology - head & neck surgery. A Canadian Society of Otolaryngology - Head & Neck Surgery (CSO-HNS) task force was convened with multi-specialty involvement from otolaryngology-head & neck surgery, general surgery, critical care and anesthesiology to develop a set of recommendations for the performance of tracheotomies during the COVID-19 pandemic.

#### **MAIN BODY:**

The tracheotomy procedure is highly aerosol generating and directly exposes the entire surgical team to the viral aerosol plume and secretions, thereby increasing the risk of transmission to healthcare providers. As such, we believe extended

endotracheal intubation should be the standard of care for the entire duration of ventilation in the vast majority of patients. Pre-operative COVID-19 testing is highly recommended for any non-emergent procedure.

#### CONCLUSION:

The set of recommendations in this document highlight the importance of avoiding tracheotomy procedures in patients who are COVID-19 positive if at all possible. Recommendations for appropriate PPE and environment are made for COVID-19 positive, negative and unknown patients requiring consideration of tracheotomy. The safety of healthcare professionals who care for ill patients and who keep critical infrastructure operating is paramount.

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25.J Cardiovasc Magn Reson. 2020 Apr 27;22(1):26. doi: 10.1186/s12968-020-00628-w.

#### **Society for Cardiovascular Magnetic Resonance (SCMR) guidance for the practice of cardiovascular magnetic resonance during the COVID-19 pandemic.**

Han Y<sup>1</sup>, Chen T<sup>2</sup>, Bryant J<sup>3</sup>, Bucciarelli-Ducci C<sup>4</sup>, Dyke C<sup>5</sup>, Elliott MD<sup>6</sup>, Ferrari VA<sup>2</sup>, Friedrich MG<sup>7</sup>, Lawton C<sup>4</sup>, Manning WJ<sup>8</sup>, Ordovas K<sup>9</sup>, Plein S<sup>10</sup>, Powell AJ<sup>11</sup>, Raman SV<sup>12</sup>, Carr J<sup>13</sup>.

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#### Abstract

The aim of this document is to provide general guidance and specific recommendations on the practice of cardiovascular magnetic resonance (CMR) in the era of the COVID-19 pandemic. There are two major considerations. First, continued urgent and semi-urgent care for the patients who have no known active COVID-19 should be provided in a safe manner for both patients and staff. Second, when necessary, CMR on patients with confirmed or suspected active COVID-19 should focus on the specific clinical question with an emphasis on myocardial function and tissue characterization while optimizing patient and staff safety.

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### **COVID-19: an FY1 on the frontline.**

[Jeyabaladevan P<sup>1</sup>](#).

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#### **Abstract**

The global spread of COVID-19 has put increased pressure on the NHS. The Government has put in a number of strategies to cope with this pandemic, which includes increasing funding for the NHS. However, increased funding itself will not ease the workload. With a number of our staff isolating from work due to COVID-19, we as the workforce have to step out of comfort zones and work in unfamiliar specialties. These are unprecedented times and are placing strains on our health service. Nonetheless, we as healthcare professionals have taken oaths that we are honouring and will continue to do so, till this virus is put to rest.

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27. J Prim Care Community Health. 2020 Jan-Dec;11:2150132720922957. doi: 10.1177/2150132720922957.

### **Increasing the Signal-to-Noise Ratio: COVID-19 Clinical Synopsis for Outpatient Providers.**

[Sartor Z<sup>1</sup>](#), [Hess B<sup>1</sup>](#).

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#### **Abstract**

The novel coronavirus (SARS-CoV-2), which is the cause of coronavirus disease (COVID-19 formally 2019-nCoV), has received widespread attention from the medical community. Despite the rapid publication of research on the virus and the disease it causes, there is a lack of concise and relevant material to help busy medical providers navigate recognition and management of the disease in the ambulatory setting. This review article aims to bridge this gap by briefly reviewing the key points of the evaluation and treatment of patients with COVID-19 in the ambulatory clinic environment.

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### **Survival rate in acute kidney injury superimposed COVID-19 patients: a systematic review and meta-analysis.**

[Ali H<sup>1</sup>](#), [Daoud A<sup>2</sup>](#), [Mohamed MM<sup>3</sup>](#), [Salim SA<sup>4</sup>](#), [Yessayan L<sup>5</sup>](#), [Baharani J<sup>1</sup>](#), [Murtaza A<sup>6</sup>](#), [Rao V<sup>7</sup>](#), [Soliman KM<sup>7</sup>](#).

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6. Department of Medicine, Division of Nephrology, Walsall Manor Hospital, UK.
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### **The role of natriuretic peptide estimation in severe COVID-19.**

[Mahajan K<sup>1</sup>](#), [Negi P<sup>2</sup>](#).

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#### **Abstract**

Since its inception in Wuhan in December 2019, Coronavirus disease 2019 (COVID-19) has shattered the economies and health-care infrastructures worldwide. Even the best of health-care systems (United States, Italy) have been overwhelmed and collapsed because of this unprecedented pandemic. India is preparing itself for the onslaught of Coronavirus. After recording its first case on January 30th, 2020, the rise was slow until the last week of March. However, since then, the number of cases has increased exponentially, and as on April 14th, 2020, there have been more than 10,000 cases of coronavirus disease (COVID-19) in India, which has resulted in more than 350 deaths.

PMID: 32340429

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30. Mar Drugs. 2020 Apr 23;18(4). pii: E225. doi: 10.3390/md18040225.

### **Putative Inhibitors of SARS-CoV-2 Main Protease from A Library of Marine Natural Products: A Virtual Screening and Molecular Modeling Study.**

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#### **Abstract**

The current emergency due to the worldwide spread of the COVID-19 caused by the new severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a great concern for global public health. Already in the past, the outbreak of severe acute respiratory syndrome (SARS) in 2003 and Middle Eastern respiratory syndrome (MERS) in 2012 demonstrates the potential of coronaviruses to cross-species borders and further underlines the importance of identifying

new-targeted drugs. An ideal antiviral agent should target essential proteins involved in the lifecycle of SARS-CoV. Currently, some HIV protease inhibitors (i.e., Lopinavir) are proposed for the treatment of COVID-19, although their effectiveness has not yet been assessed. The main protease ( $M^P$ ) provides a highly validated pharmacological target for the discovery and design of inhibitors. We identified potent  $M^P$  inhibitors employing computational techniques that entail the screening of a Marine Natural Product (MNP) library. MNP library was screened by a hyphenated pharmacophore model, and molecular docking approaches. Molecular dynamics and re-docking further confirmed the results obtained by structure-based techniques and allowed this study to highlight some crucial aspects. Seventeen potential SARS-CoV-2  $M^P$  inhibitors have been identified among the natural substances of marine origin. As these compounds were extensively validated by a consensus approach and by molecular dynamics, the likelihood that at least one of these compounds could be bioactive is excellent.

PMID: 32340389

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31. Int J Environ Res Public Health. 2020 Apr 23;17(8). pii: E2933. doi: 10.3390/ijerph17082933.

### **Discrimination and Social Exclusion in the Outbreak of COVID-19.**

[He J<sup>1</sup>](#), [He L<sup>2</sup>](#), [Zhou W<sup>1</sup>](#), [Nie X<sup>1</sup>](#), [He M<sup>1</sup>](#).

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#### **Abstract**

This paper is aimed to document the observed social exclusion and discrimination in the outbreak of COVID-19 across the world and inside of China. Discrimination and social exclusion has occurred in various forms, while 25.11% of respondents overseas experienced discrimination in the breakout of COVID-19, and 90% of respondents inside of China exhibited discriminatory attitudes. The discrimination and social exclusion also lead to a range of damaging social outcomes. Thus, this is an urgent call for the inclusiveness in policy and media in the face of this public health emergency.

PMID: 32340349

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32. Int J Environ Res Public Health. 2020 Apr 23;17(8). pii: E2932. doi: 10.3390/ijerph17082932.

### **Airborne Transmission Route of COVID-19: Why 2 Meters/6 Feet of Inter-Personal Distance Could Not Be Enough.**

[Setti L<sup>1</sup>](#), [Passarini F<sup>2</sup>](#), [De Gennaro G<sup>3</sup>](#), [Barbieri P<sup>4</sup>](#), [Perrone MG<sup>5</sup>](#), [Borelli M<sup>6</sup>](#), [Palmisani J<sup>3</sup>](#), [Di Gilio A<sup>3</sup>](#), [Piscitelli P<sup>7,8</sup>](#), [Miani A<sup>8,9</sup>](#).

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### Abstract

The COVID-19 pandemic caused the shutdown of entire nations all over the world. In addition to mobility restrictions of people, the World Health Organization and the Governments have prescribed maintaining an inter-personal distance of 1.5 or 2 m (about 6 feet) from each other in order to minimize the risk of contagion through the droplets that we usually disseminate around us from nose and mouth. However, recently published studies support the hypothesis of virus transmission over a distance of 2 m from an infected person. Researchers have proved the higher aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1 (with the virus remaining viable and infectious in aerosol for hours) and that airborne transmission of SARS-CoV can occur besides close-distance contacts. Indeed, there is reasonable evidence about the possibility of SARS-CoV-2 airborne transmission due to its persistence into aerosol droplets in a viable and infectious form. Based on the available knowledge and epidemiological observations, it is plausible that small particles containing the virus may diffuse in indoor environments covering distances up to 10 m from the emission sources, thus representing a kind of aerosol transmission. On-field studies carried out inside Wuhan Hospitals showed the presence of SARS-CoV-2 RNA in air samples collected in the hospitals and also in the surroundings, leading to the conclusion that the airborne route has to be considered an important pathway for viral diffusion. Similar findings are reported in analyses concerning air samples collected at the Nebraska University Hospital. On March 16th, we have released a Position Paper emphasizing the airborne route as a possible additional factor for interpreting the anomalous COVID-19 outbreaks in northern Italy, ranked as one of the most polluted areas in Europe and characterized by high particulate matter (PM) concentrations. The available information on the SARS-CoV-2 spreading supports the hypothesis of airborne diffusion of infected droplets from person to person at a distance greater than two meters (6 feet). The inter-personal distance of 2 m can be reasonably considered as an effective protection only if everybody wears face masks in daily life activities.

PMID: 32340347

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33. *Viruses*. 2020 Apr 23;12(4). pii: E476. doi: 10.3390/v12040476.

### [Shedding Light on the Effect of Natural Anti-Herpesvirus Alkaloids on SARS-CoV-2: A Treatment Option for COVID-19.](#)

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### Abstract

The whole world is currently facing an unseen enemy, called coronavirus disease 2019 (COVID-19), which is causing a global pandemic. This disease is caused by a novel single-stranded enveloped RNA virus, known as the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2). Although huge efforts are being made to produce effective therapies to combat this disease, it continues to be one of the greatest challenges in medicine. There is no doubt that herpesviruses are one of the most important viruses that infect humans and animals, and infections induced by these pathogens have developed into a great threat to public health. According to the currently available evidence, the correlation between herpesviruses and coronaviruses is limited to the induced complications following the infections. For instance, the inflammation that is induced at the sites of infection could tie these viruses to each other in a relationship. Another example, bovine herpesvirus 1, which is an important pathogen of cattle, can cause a severe respiratory infection; the same way in which SARS-CoV-2 affects humans. Considering the current circumstances related to the COVID-19 crisis, this editorial paper, which belongs to the Special Issue "Recent Advances in Herpesviruses Research: What's in the Pipeline?" aims to draw attention to some natural anti-herpesvirus alkaloid



compounds, which have recently been proven to have excellent inhibitory efficacy against SARS-CoV-2 replication. Thus, this special focus is an attempt to hunt down various treatment options to combat COVID-19 based on repurposing drugs that are known to have multiple antiviral properties, including against herpesvirus.

PMID: 32340120

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34. Int J Environ Res Public Health. 2020 Apr 23;17(8). pii: E2906. doi: 10.3390/ijerph17082906.

### **The Use of Digital Health in the Detection and Management of COVID-19.**

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#### **Abstract**

Digital health is uniquely positioned to enhance the way we detect and manage infectious diseases. This commentary explores the potential of implementing digital technologies that can be used at different stages of the COVID-19 outbreak, including data-driven disease surveillance, screening, triage, diagnosis, and monitoring. Methods that could potentially reduce the exposure of healthcare providers to the virus are also discussed.

PMID: 32340107

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