

Novel Coronavirus (COVID-19) Issues

Literature review

Over the last two decades the world has been experiencing a global viral epidemic of zoonotic origins^{1,2}. Zoonosis is the name given to diseases or infections that can be transmitted between humans and animals. Zoonotic viruses that are of particular interest are the viruses that are transmitted from animals (usually vertebrates) to humans. The latest examples of zoonotic viruses are HIV, avian (bird) flu (H5N1, outbreaks in 2006-2013), swine flu (H1N1, outbreaks in 2009-2010), Ebola (EVD or EHF, ongoing outbreaks), SARS (SARS-CoV, outbreak in 2003)³.

The outbreak of the new zoonotic coronavirus that occurred in Wuhan (China) at the end of 2019 which was linked to the seafood market in Wuhan (Hubei, China), is currently causing concern in the medical community, as the virus continues to spread around the world⁴. On Feb 11, 2020, the WHO announced an official name for the novel disease: coronavirus disease 2019 (COVID-19). COVID-19 originates from the family of coronaviruses that cause Severe Acute Respiratory Syndrome (SARS), that is why it is also called SARS-CoV-2. According to peer-reviewed literature, the ways that the SARS-CoV-2 is transmitted are not the same as those for SARS-CoV, and symptoms of the disease are not always evident when people are already infected.

Since the identification of the virus in late December 2019, the number of cases from

China that have been imported into other countries is on the rise, and the epidemiological picture is changing on a daily basis. Because COVID-19 is still novel, there is a limited amount of research available (mainly studies of the patients that were admitted and treated in hospitals), and for the time being information about the virus' behaviour that is reported in peer-reviewed literature does not allow for a firm conclusion to be formed about the means of transmission. As with all outbreaks, there is a need to develop effective diagnostics, therapeutics, and vaccines. The following results have already been obtained and published in literature.

1. Several experimental diagnostic platforms are already in use in several countries.
2. The whole-genome sequence of SARS-CoV-2 was obtained and shared widely by mid-January, a speed which was not possible during previous infectious disease outbreaks⁵.
3. It was known that coronavirus is temperature-sensitive and survives better in temperatures below 30°C⁹.
4. An article reports the presence of lung damage (unilateral ground-glass opacities) in a subgroup of asymptomatic patients with confirmed COVID-19 pneumonia, supporting previous reports that asymptomatic patients could have lung damage before

symptom⁶.

5. An article on the clinical studies of the COVID-19 cases in Germany reports that transmission of the virus could happen either during the asymptomatic incubation period or post recovery of the virus carrier from the illness and their return to normal activity. This article provides evidence that in addition to the fact that asymptomatic patients (no symptoms of illness) can carry the COVID-19 infection, a person who gets mildly ill and quickly recovers is still capable of carrying the virus (high sputum viral load), thus is still being infectious. Such findings raise concern for not only potential transmission during the incubation period, but also for potential transmission due to the prolonged shedding of COVID-19 after recovery⁷.

There are other recent journal articles that report different or similar facts. On one hand, all of these findings have slowly been allowing for a certain assessment to be made on the transmission dynamics of the current outbreak and increase the possibility of making vaccine. But on the other hand they also clarify that “there is unlikely to be a viable vaccine for at least another 12–18 months. Dozens of clinical trials of treatment are underway, but it will be weeks or months before the results are known. There may be no way to prevent a COVID-19 pandemic in this globalised time, but verified information is the most effective prevention against the disease of panic”¹.

Based on all that has been described above, it is very important to say that the panic that is currently developing and taking over the general public will not serve any purpose in aiding with coping, preventing, or mitigating the potential of the upcoming pandemic. There is no talk about directly experienced cases of panic, such as fights in stores, anger, etc., it is important to point out that indirect cases, such as the disappearance of particular food items and hand sanitisers from stores, as well as the disappearance of face masks both in stores and

online is also a sign of panic among the general public.

Preventative Measures

Human-to-human transmission of COVID-19 has been described in recent literature as not only likely via droplets/mucus, but also possibly via contaminated hands or surfaces⁸. The problem is that according to recent findings on COVID-19, quarantining potential virus carriers, wearing face masks in public, and using hand sanitisers regularly, may not be sufficient to prevent the distribution of the virus, because coronavirus is capable of surviving on surfaces for a relatively long time, from 9 to 28 days⁹ (the number of days is still not confirmed). What does this mean for us consumers? This means that any visit to the “outside world” (stores, work, public places, etc.) can potentially result with catching and bringing the virus home on our hands, bags, purses, clothes... What can be done to minimise the risk of exposure to the virus? The only way to minimise the risk is personal hygiene and high responsibility in regards to other people. What does this mean in practice? Here are some simple preventative measures that can be used by all of us:

1. Wash your hands every time you go out and when you come back in. This is related not only to home, but also when you go to work, a store, a restaurant, etc.
2. When you go to the store and decide to make use of store baskets or carts, use hand sanitiser and spray a surface disinfectant on the handles of the store’s carrying devices.
3. When you are in the store, do not touch products on the shelves unnecessarily. If you take the product and place it in the carrying basket, spray the package with surface disinfectant.
4. Do not put boxes, bags, purses, etc. that you bring from the stores on tables or chairs, put them on the floor and wash or clean floors regularly (use chemical cleaners).

5. Do not touch your eyes, lips, nose (general face area), that is the main point of entry for virus. If touching the face is absolutely necessary, do so with tissues or napkins. Wash or disinfect your hands afterwards. When you dispose of any napkins, you also may spray them with surface disinfectant.
6. Never cough into your hands, use your elbow.

It is possible to think about other methods and rules of hygiene that will further aid in preventing the spread of any infection, not just COVID-19. If all of us will act responsibly, it will significantly increase the chances of not spreading or catching the infection.

There are numerous peer-reviewed articles that list surface disinfectants that reduce coronavirus (SARS-CoV) infectivity within 1 minute^{8,9}. These are the following disinfection agents that were tested to be effective for the inactivation of coronavirus: ethanol 62-71%, hydrogen peroxide 0.5%, sodium hypochlorite 0.1%. Other compounds such as benzalkonium chloride 0.05-0.2% or chlorhexidine digluconate 0.02% are less effective. According to the researchers, it is expected that the above-listed disinfectants will have a similar effect against the SARS-CoV-2 and will help to ensure an early containment and prevention of further viral spread⁹.

There are other disinfectants that were not tested by researchers for their efficiency at coronavirus inactivation (at least a literature search did not produce any such results), but they are known to be very efficient against the influenza family of viruses. These other disinfectants are chlorine dioxide¹⁰ and KMPS¹¹ (potassium monopersulphate). Both of these disinfectants and various disinfection products that contain these disinfectants in their formulas often perform much better virucidal work than the other commonly used disinfectants that were clinically tested for their efficiency at coronavirus inactivation and are listed in the previous paragraph.

Osorno has been working with all of the

disinfectants described above for more than a decade and can state that general disinfection efficiency of hydrogen peroxide, chlorine dioxide, and potassium monopersulphate based products was confirmed in large numbers of studies published in peer-review journals. Listed below are products manufactured and/or offered by Osorno Enterprises Inc. that can be used for surface disinfection for inactivation of coronavirus.

1. [DisOx™](#) KMPS based powder for preparation of all purpose surface cleaner and disinfectant solutions.
2. [PowerOxide™](#) two component powder, for preparation of chlorine dioxide solutions for water, surface and air disinfection.
3. [DisOx™ L](#) solution for surface disinfection with 2% DisOx™ concentration (ready for spraying).
4. PowerOxide™ LF solution for surface disinfection, formula contains 0.02% concentration of chlorine dioxide (ready for spraying).
5. [HydroD](#) solution for surface disinfection, formula contains 0.5% concentration of hydrogen peroxide.
6. [Isopropil Alcohol 80%](#) jugs and spray solution for surface disinfection.

It is important to mention that chlorine dioxide is used not only for surface disinfection¹², but also for water disinfection and air disinfection. The properties of this universal disinfectant will be described in the next newsletter.

WARNING: Please keep in mind that consumption or inhalation of disinfectant will not assist in prevention or treatment of viruses. Use of recommended doses will only disinfect the medium it is intended for.

Osorno provides scientific advice and affordable environmental solutions for a cleaner and safer world.

With questions please contact:

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- 1 - COVID-19: Fighting panic with information. www.thelancet.com Vol 395 February 22, 2020
- 2 - <https://www.cdc.gov/onehealth/basics/zoonotic-diseases.html>
- 3 - <https://www.who.int/zoonoses/diseases/en/>
- 4 - A novel coronavirus from patients with pneumonia in China. Zhu N, Zhang D, Wang W, et al. 2019. N Engl J Med. DOI: 10.1056/NEJMoa2001017. <https://www.nejm.org/doi/full/10.1056/NEJMoa2001017>
- 5 - Challenges of coronavirus disease 2019. www.thelancet.com/infection. Vol 20 March 2020
- 6 - COVID-19 pneumonia: what has CT taught us? www.thelancet.com/infection. Published online February 24, 2020 [https://doi.org/10.1016/S1473-3099\(20\)30134-1](https://doi.org/10.1016/S1473-3099(20)30134-1)
- 7 - Transmission of 2019-nCoV Infection from an Asymptomatic Contact in Germany, 2020. N Engl J Med. DOI: 10.1056/NEJMc2001468. <https://www.nejm.org/doi/10.1056/NEJMc2001468>
- 8 - Potential role of inanimate surfaces for the spread of coronaviruses and their inactivation with disinfectant agents. Kampf G. Infection Prevention in Practice 2 (2020) 100044. <http://creativecommons.org/licenses/by-nc-nd/4.0/>
- 9 - Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents. Kampf G, Todt D, Pfaender S, Steinmann E. Journal of Hospital Infection (2020) <https://doi.org/10.1016/j.jhin.2020.01.022>
- 10 - Protective effect of low-concentration chlorine dioxide gas against influenza A virus infection. Ogata N, Shibata T. Journal of General Virology (2008), 89, 60–67. DOI 10.1099/vir.0.83393-0.
- 11 - Bactericidal and virucidal efficacies of potassium monopersulfate and its application for inactivating avian influenza virus on virus-spiked clothes. Sonthipet S, Ruenphet S, Takehar K. J Vet Med Sci. 2018 Apr; 80(4): 568–573. Published online 2018 Feb 12. doi: 10.1292/jvms.17-0599.
- 12 - Preventing Spread of Coronavirus Disease 2019 (COVID-19) . Guideline for Airport (the 2nd Version). <https://www.iata.org/contentassets/7e8b4f8a2ff24bd5a6edcf380c641201/airport-preventing-spread-of-coronavirus-disease-2019.pdf>.

Important Links:

Health Canada

<https://www.canada.ca/en/public-health/services/diseases/coronavirus-disease-covid-19.html>

Center for Disease Control:

<https://www.cdc.gov/coronaviruses/index.html2>.

World Health Organization:

<https://www.who.int/emergencies/diseases/novel-coronaviruses-2019>

[https://www.who.int/publications-detail/risk-communication-and-community-engagement-readiness-and-initial-response-for-novel-coronaviruses-\(ncov\)](https://www.who.int/publications-detail/risk-communication-and-community-engagement-readiness-and-initial-response-for-novel-coronaviruses-(ncov))