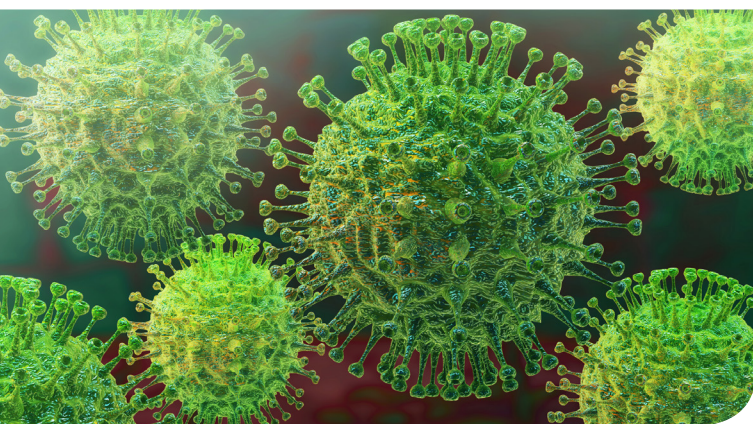


COVID-19 Virus

Water, Sanitation and Wastewater Management

As the COVID-19 Virus associated respiratory disease is rapidly spreading worldwide, this fact sheet will provide up to date information as it becomes available to inform the public and water sector professionals on the attributions of this virus and any measures needed to protect both workers and public health.



The COVID-19 Virus

The virus, technically named SARS-CoV-2 (also referred to as COVID-19 Virus), is a newly identified virus and the resulting illness is referred to as COVID-19. This virus is in the same Coronavirus family as severe acute respiratory syndrome coronavirus (SARS-CoV or SARS) and Middle East respiratory syndrome coronavirus (MERS-CoV or MERS), which caused the two previous coronavirus outbreaks in 2003 (SARS) and 2012 (MERS)³.

Since SARS and MERS are from the same family of coronaviruses, they have similar physical and biochemical properties and comparable transmission routes as COVID-19 Virus. In the absence of COVID-19 Virus specific data, we rely on SARS, MERS, and coronavirus surrogate data to extrapolate, assess, and manage risk.

The morphology and chemical structure of the COVID-19 Virus is very similar to other surrogate human coronaviruses for which there is evidence on both survival in the environment and effective inactivation measures². Currently, there is a lack of evidence regarding the survival of COVID-19 Virus in drinking water or sewage.

COVID-19

The COVID-19 disease was identified in late 2019 associated with an outbreak of pneumonia in Wuhan City, Hubei Province, China. Initial cases were spread from animals to humans. However, there is now confirmed direct human-human transmission, likely via droplets,

direct contact with nasal secretions, and contact with surfaces that have been contaminated by someone coughing and sneezing. The features of COVID-19 bear some resemblance to those of SARS and MERS¹.

Drinking Water and Sanitation

The presence of the COVID-19 Virus has not been detected in drinking-water supplies and based on current evidence the risk to water supplies is low (2.WHO Fact Sheet). There is also no evidence that the COVID-19 Virus is transmitted by drinking water. The current evidence is that COVID-19 is most likely transmitted from person-to-person by sneezing and coughing. There is no evidence that drinking water will be affected by the COVID-19 Virus⁴.

Is the COVID-19 Virus removed from Wastewater?

There is no evidence to date that the COVID-19 Virus has been transmitted via sewerage systems, with or without wastewater treatment. Furthermore, there is no evidence that sewage and wastewater treatment workers contracted SARS, another type of coronavirus that caused a large outbreak of acute respiratory illness in 2003. As part of an integrated public health policy, wastewater carried in sewerage systems should ideally be treated in well-designed and well-managed centralised wastewater treatment works.

Some coronaviruses can potentially survive in the gastrointestinal tract and be spread by the 'faecal-oral' route or via inhalation of contaminated wastewater droplets. There have not been reports of faecal-oral transmission of COVID-19 to date². Two studies have reported detection of COVID-19 fragments in faecal matter of COVID-19 patients^{7,8}. Whilst plausible, because it's newly discovered, it is not yet certain how well the virus is able to survive in water and wastewater. However, nasal secretions are found in wastewater (e.g. due to flushing of tissues) and most likely COVID-19 will enter wastewater systems. Furthermore, the most similar virus tested, SARS-CoV, was shown to be present in wastewater and to persist in faeces, urine, water and wastewater for periods up to 2 days at 20°C, at least 14 days at 4°C, and survive for 4 days in diarrheal stool samples with an alkaline pH at room temperature in spiked samples^{5,6}.

Based on this, it is possible that the COVID-19 Virus may be present in wastewater where COVID-19 infections are present. Importantly, the same is true for a wide variety of pathogens, such as other viruses, bacteria and protozoa. But what we do know is that the COVID-19 Virus is an enveloped virus that is expected to be more sensitive to disinfection than non-enveloped viruses such as coxsackievirus, Hep A and adenovirus.



COVID-19 Virus

Water, Sanitation and Wastewater Management

Working around Wastewater

The controls already in place to protect persons working around wastewater are based on keeping workers safe from much more readily transmissible and established faecal-oral pathogens (such as norovirus, adenovirus, hepatitis A virus, *Cryptosporidium*, *Giardia* and *Campylobacter*). The key point is that existing, standard approaches, already used for working safely with wastewater, still apply, and no special or specific changes need to be made due to the COVID-19 Virus. The COVID-19 Virus is just one of many pathogens including viruses potentially present in wastewater. Exposure to all pathogens in the workplace and in wastewater should be managed by following 'business as usual' best practices for protecting the occupational health of workers at sanitation treatment facilities. Workers should wear appropriate personal protective equipment (PPE), which may include protective outer wear, gloves, boots, goggles, mask, perform frequent hand hygiene, and avoid touching eyes, nose and mouth with unwashed hands².

IMPORTANT:

Continue Good hygiene practices

- Wash your hands often with soap and water before and after eating as well as after attending the toilet. If soap and water are not available use an alcohol-based hand rub;
- Wear appropriate PPE when working in areas where exposure to untreated wastewater is possible – safety goggles, face shields (or masks), as well as increased hand hygiene;
- Avoid touching eyes, nose and mouth with unwashed hands;
- Avoid contact with others if they have cold and flu like symptoms;
- Clean and disinfect surfaces and floors;
- Cough and sneeze into your elbow;
- Stay home if you are unwell.

References:

- ¹ Novel Coronavirus (COVID-19) - Water and Sanitation (Water Research Australia, 5 March 2020)
https://www.waterra.com.au/_r9550/media/system/attrib/file/2200/WaterRA_FS_Coronavirus_V11.pdf
- ² WHO (Water, Sanitation, hygiene and waste management for COVID-19 Technical Brief (3 March 2020)
<https://www.who.int/publications-detail/water-sanitation-hygiene-and-waste-management-for-covid-19>
- ³ The Water Professional's guide to COVID-19 (Water Environment Federation, 11 February 2020)
<https://wef.org/news-hub/wef-news/the-water-professionals-guide-to-the-2019-novel-coronavirus/>
- ⁴ COVID-19 Fact Sheet, WSAA, 9 March 2020: <https://www.wsaa.asn.au/publication/covid-19-fact-sheet>
- ⁵ Wang *et al.*, (2005). Study on the resistance of severe acute respiratory syndrome-associated coronavirus, *Journal of Virological Methods*; **126**: 171–177.
- ⁶ Lai *et al.*, (2005). Survival of severe acute respiratory syndrome coronavirus, *Clinical Infectious Diseases*; **41**: 67-71.
- ⁷ Xiao *et al.*, (2020). Evidence for gastrointestinal infection of SARS-CoV. Preprint. (accessed March 05, 2020).
- ⁸ Holshue *et al.*, (2020). Washington State 2019-nCoV Case Investigation Team. First Case of 2019 Novel Coronavirus in the United States. *N Engl J Med*; **382**: 929-936. (accessed March 05, 2020).

Disclaimer: The information posted here is a summary of current knowledge about the COVID-19 Virus. The state of knowledge will evolve as additional investigation and research is conducted, so continuous review of reputable sources and websites is advised. This fact sheet will be updated as new information becomes available.