

## Evidence check

11 April 2020

Rapid evidence checks are based on a simplified review method and may not be entirely exhaustive, but aim to provide a balanced assessment of what is already known about a specific problem or issue. This brief has not been peer-reviewed and should not be a substitute for individual clinical judgement, nor is it an endorsed position of NSW Health.

## Modes of transmission for COVID-19

### Rapid review question

What is the available evidence about COVID-19 modes of transmission?

### In brief

- The World Health Organisation (WHO) has released a summary of the modes of transmission of the COVID-19 virus.
- Current evidence suggests COVID-19 virus is primarily transmitted via respiratory droplets and contact routes.
- Airborne transmission may be possible in specific circumstances and settings, however an analysis of 75,465 COVID-19 cases in China did not find airborne transmission.
- Several studies have been published which demonstrate the presence of SARS-CoV-2 RNA in faeces of COVID-19 patients, and live virus has been observed; two of 14 studies detected viral RNA in urine sediments. There have been no reports of disease transmission via faeces or urine.

### Limitations

- Evidence on this topic is emerging rapidly
- The evidence check is based on a WHO publication with supplementary searches on disease transmission via faeces or urine.

### Methods (Appendix 1)

This rapid evidence check is based on the modes of transmission WHO report.(1) Supplementary searches were undertaken on virology in urine and faeces on 8 April 2020.

### Results

Respiratory infections can be transmitted through droplets of different sizes:

- Particles of >5-10 µm in diameter are known as respiratory droplets and transmission occurs when a person is in close contact (within 1 m) with someone who has respiratory symptoms (e.g., coughing or sneezing) or via surfaces or objects (fomites) in the immediate environment around the infected person.

- Particles of <math><5\mu\text{m}</math> in diameter are known as droplet nuclei which can remain in the air for long periods of time and be transmitted to others over distances greater than 1 metre (1)

Current evidence suggests COVID-19 virus is primarily transmitted via respiratory droplets and contact routes. An analysis of 75,465 COVID-19 cases in China did not find airborne transmission. (2)

However, airborne transmission may be possible in specific circumstances and settings in which procedures or treatments that generate aerosols are performed. These include: endotracheal intubation, bronchoscopy, open suctioning, administration of nebulized treatment, manual ventilation before intubation, turning the patient to the prone position, disconnecting the patient from the ventilator, non-invasive positive-pressure ventilation, tracheostomy, and cardiopulmonary resuscitation.(1)

There is some evidence that COVID-19 may lead to intestinal infection and be present in faeces. Multiple studies have demonstrated the presence of SARS-CoV-2 RNA in faeces of COVID-19 patients (3-8), and live virus has been observed in stool samples (4) suggesting the possibility of SARS-CoV-2 transmission via the faecal-oral route There have been no reports of faecal-oral transmission of the COVID-19 virus to date (1).

A rapid search in PubMed found 14 articles from China, Singapore, and Europe that investigated urine specimens. Only two small studies detected of SARS-CoV-2 RNA fragment in urine sediments. (9-10) There is insufficient evidence to determine whether these fragments contribute to disease transmission.

## References

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4. Wang W, Xu Y, Gao R, Lu R, Han K, Wu G, et al. Detection of SARS-CoV-2 in Different Types of Clinical Specimens. *JAMA*. 2020.
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6. Ling Y, Xu SB, Lin YX, Tian D, Zhu ZQ, Dai FH, et al. Persistence and clearance of viral RNA in 2019 novel coronavirus disease rehabilitation patients. *Chin Med J (Engl)*. 2020.
7. Cheung KS, Hung IF, Chan PP, Lung KC, Tso E, Liu R, et al. Gastrointestinal Manifestations of SARS-CoV-2 Infection and Virus Load in Fecal Samples from the Hong Kong Cohort and Systematic Review and Meta-analysis. *Gastroenterology*. 2020.
8. Lin L, Jiang X, Zhang Z, Huang S, Zhang Z, Fang Z, et al. Gastrointestinal symptoms of 95 cases with SARS-CoV-2 infection. *Gut*. 2020.
9. Wang L LX, Chen H, Yan S, Li D, Li Y, et al. Coronavirus Disease 19 Infection Does Not Result in Acute Kidney Injury: An Analysis of 116 Hospitalized Patients from Wuhan, China. *American Journal of Nephrology* 2020:1-6. 2020.
10. Peng L LJ, Xu W, Luo Q, Deng K, Lin B, et al. Novel Coronavirus can be detected in urine, blood, anal swabs and oropharyngeal swabs samples. . *medRxiv* 2020. 2019.

## Appendix 1

### Supplementary searches

PubMed: (((2019-nCoV[title/abstract] or nCoV[title/abstract] or covid-19[title/abstract] or covid19[title/abstract] or "covid 19"[title/abstract] OR "coronavirus"[MeSH Terms] OR "coronavirus"[title/abstract]))) AND (((urin\*) OR urine[Title/Abstract]) OR urinary tract[Title/Abstract])

PubMed: (2019-nCoV[title/abstract] or nCoV[title/abstract] or covid-19[title/abstract] or covid19[title/abstract] or "covid 19"[title/abstract] OR "coronavirus"[MeSH Terms] OR "coronavirus"[title/abstract]) AND (((faecal\*[Title/Abstract]) OR (feces[Title/Abstract]) OR (faeces[Title/Abstract]))