

# Minimizing the risk of SARS-CoV-2 transmission through good cleaning and disinfection practices

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## What is SARS-CoV-2?

SARS-CoV-2<sup>1,2</sup> is a new strain of coronavirus that was discovered in Wuhan, China, in 2019. You may also see it referred to as the Wuhan novel coronavirus; 2019-nCoV; WN-CoV; HCoV-19 (SARS-2). SARS is the acronym for Severe Acute Respiratory Syndrome, and CoV is that for Coronavirus.

## What is COVID-19?

COVID-19 is the disease associated with SARS-CoV-2.

This white paper uses the terms SARS-CoV-2 in reference to the virus, and COVID-19 in reference to the viral infection.

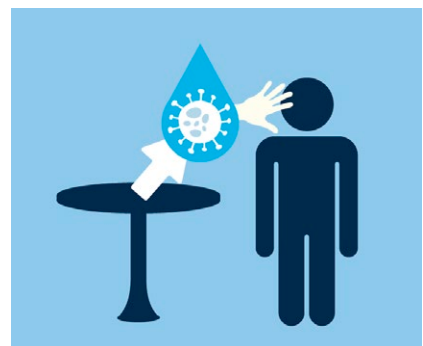
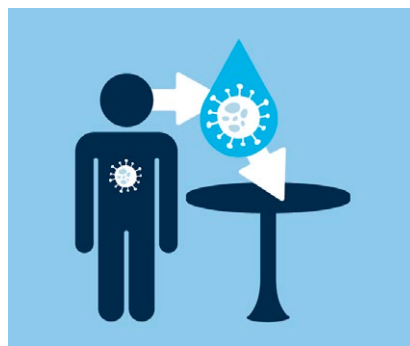
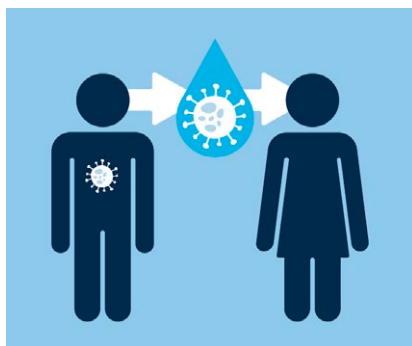
## How is it spread?

The primary route of transmission for SARS-CoV-2 is via inhalation of the aerosols and droplets created when an infected individual coughs or sneezes.



Photo credit James Gathary

A single cough can produce up to 3,000 droplets. These droplets can land on the surrounding people, textiles and surfaces. Transmission of the virus can then also occur through touching the contaminated item, and subsequent touching of the mucous membranes of the mouth, nose or eyes.



The European Food Safety Authority (EFSA<sup>3</sup>) has stated that there is currently no evidence that food is a likely source or route of transmission of COVID-19. Experiences from previous outbreaks of related coronaviruses show that transmission through food consumption did not occur.

However, droplet and aerosols, created when an infected individual coughs or sneezes will settle onto the surface of unwrapped, ready-to-eat products like fruit, vegetables, and baked goods, and onto the surfaces that these foods are in contact with. Equally, goods like these could have virus transferred to them via contaminated hands when handled. At a recent World Health Organisation (WHO) webinar on coronavirus it was suggested, as a precaution,

- to wash or peel fresh fruit and vegetables prior to consumption; and
- that baked products be wrapped prior to display and sale.

If the products are hand packed, hands should be thoroughly washed and dried before handling the product.

SARS coronaviruses are easily inactivated by heat. Cooking or heating of food to a temperature  $>133^{\circ}$  for a minimum 15 minutes should destroy the virus on the surface of the food.

#### How long can SARS-CoV-2 remain viable in the environment?

A recent study<sup>4</sup> has shown that the SARS-CoV-2 virus (specifically) can remain viable on cardboard for up to 24 hours, and for 2-3 days on plastic and stainless-steel surfaces. However, copper surfaces inactivated the virus in about four hours. Viability on clothing and hair is not yet known.

Virus viability on surfaces will depend on several factors including, the type of surface; the presence of organic material (biological fluids, biofilm, food debris); temperature; relative humidity; and the specific strain of the virus.

#### How can the risk of COVID-19 transmission be minimized through cleaning and disinfection?

Viruses are tiny (up to 50 times smaller than bacteria), non-living particles that need a host (living cell) to reproduce. Their small size aids their transfer to and harbourage on surfaces, and the presence of organic matter, e.g., food and biological fluids, is likely to offer the virus some protection from disinfectants and surface antimicrobials (as it does for bacteria). Fortunately, viruses are effectively removed from surfaces through good cleaning practices, and enveloped viruses, such as SARS-CoV-2, are among the weakest or least resistant organisms to disinfection. Many disinfectants achieve their inactivation within minutes.

Consequently, routine cleaning and disinfection practices, using existing procedures, chemicals and cleaning equipment, should continue as usual.

#### Cleaning methods and equipment

Visibly dirty surfaces should always be cleaned prior to disinfection. This can be achieved through:

- manual cleaning e.g.,
  - wet cleaning: water; detergent; scrubbing; wiping; or
  - dry cleaning: brushing; scraping; wiping; or
- mechanical cleaning e.g.,
  - wet cleaning: use of floor scrubbers; hoses; foaming; or
  - dry cleaning: use of vacuum cleaners, etc.

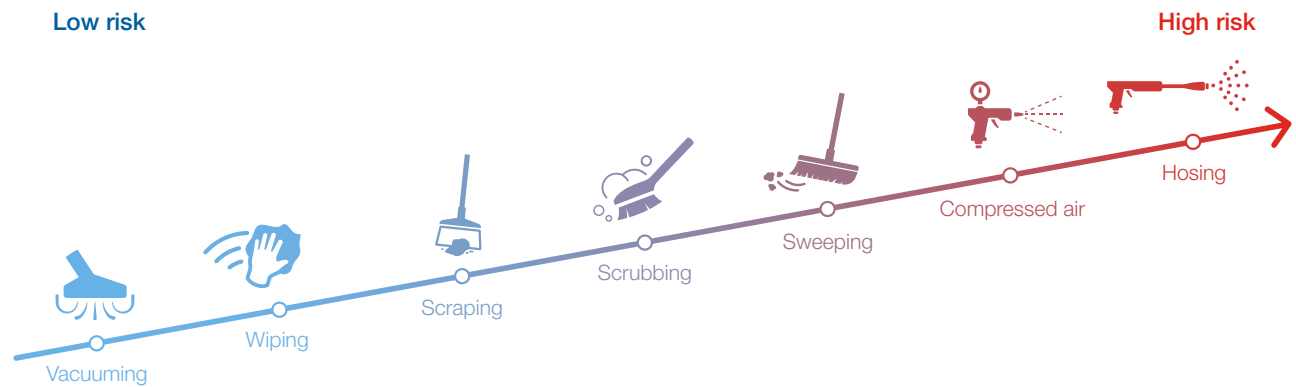


### The use of microfiber for cleaning

In principle, microfiber should be effective at removing viruses from surfaces in the same way as it is for bacteria, i.e., through electrostatic attraction (when used dry), or capillary action (when used damp). There are very few peer reviewed published studies<sup>5,6</sup> on the use of microfiber for virus removal and none (currently) in relation to SARS-CoV-2. Microfiber (both reusable and disposable) used damp or dry, without the use of chemical disinfectants, is unlikely to inactivate SAR-CoV-2. Consequently, Vikan recommends the following,

- Disposable microfiber: Use a separate disposable microfiber cloth or mop for each different surface cleaned and dispose of immediately after use.
- Reusable microfiber: Change frequently, and launder after use, using a minimum wash cycle of 56°C for 15 minutes or thermal equivalent to ensure destruction of the virus before reuse.
- Clean and disinfect hands and equipment, e.g., floor mop frames, thoroughly after use.

All cleaning activities can spread contamination. Choose the right cleaning equipment and method to maximize contamination removal and minimize its spread.



### Considerations for cleaning tools

Cleaning equipment and the personal protective equipment (PPE), used during cleaning, can themselves become vectors for SARS-CoV-2 transmission. To minimize the risk of virus harborage and transfer Vikan and Remco recommends:

- cleaning and disinfection of reuseable cleaning equipment and PPE before first use, and between use by different workers;
- choosing equipment that is single use, or hygienically designed (easy to clean and disinfect);
- disposing of single use cleaning equipment and PPE immediately after use. This could include,
  - disposable cloths and mops; gloves; arm covers; aprons; boot covers; hair nets and beard covers; earplugs.
  - Disposable items that have been used with a disinfectant will be safe to dispose of immediately, through normal waste disposal routes. The residual disinfectant will continue to work to inactivate the virus.
  - For disposable items not used with a disinfectant, these can be double bagged and quarantined for 72 hours as a precaution, before disposal via the normal route.
- Regular inspection and replacement of damaged or worn cleaning equipment and PPE.

Further information on the selection of hygienically designed cleaning tools; and cleaning tool maintenance, can be found at

- <http://viewer.ipaper.io/vikan/food-safety-information/ultra-hygiene/ultra-hygiene-advertorial-en-300/#/>
- <http://viewer.ipaper.io/vikan/white-papers/cleaning-tool-maintenance/cleaning-tool-maintenance-whitepaper-en-300/#/>

### Disinfection

#### Chemical disinfection

Many disinfectants are active against coronaviruses<sup>7,8</sup> and achieve their effective inactivation within minutes. Those currently recommended by the World Health Organisation (WHO), for environmental disinfection associated with SARS-CoV-2 in healthcare facilities<sup>9</sup>, include:

- 70% Ethyl alcohol to disinfect reusable equipment between uses.
- Sodium hypochlorite at 0.5% (equivalent 5000ppm) for disinfection of frequently touched surfaces.

For those in the U.S. and countries that follow the guidance of the US-EPA, visit <https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2> and use your EPA registration number to identify suitable disinfectants.

For those in Europe and countries using the EN norms, use a disinfectant that has approval (partial approval for enveloped viruses) to EN 14476; EN 1276; or EN 13697.

Further good sources of information for cleaning and disinfection of other environments can be found at,

- <https://www.ecdc.europa.eu/sites/default/files/documents/coronavirus-SARS-CoV-2-guidance-environmental-cleaning-non-healthcare-facilities.pdf>
- <https://www.cdc.gov/coronavirus/2019-ncov/prepare/cleaning-disinfection.html>

Alcohol disinfectants (60 - 85%) can be used for rapid disinfection of relatively small surfaces and can be applied using a spray bottle, or a cloth (preferably disposable) impregnated with the alcohol. Use a fresh cloth for each surface disinfected.

Sodium hypochlorite (1,000 – 5,000ppm) solutions can also be applied to small surfaces using a spray bottle or cloth. For disinfection of larger equipment and surfaces (at least once a day) it can be applied through use of a larger spray system, or manually using a cloth or wash brush. In all cases the hypochlorite should be left in contact with the equipment/surface, for an \*appropriate period, prior to rinsing.

In food and beverage production facilities, due to the materials of equipment and facility construction, levels of hypochlorite around 1,000ppm are suggested, as is the use of Peracetic acid. This will reduce the risk of material corrosion and product taint respectively.

\*The contact time of any disinfectant formulation used should be checked with the chemical supplier. The contact time needs to be sufficient to allow it to inactivate the virus.

Whole room disinfection is the use of a fine mist of liquid disinfectant (fogging) or biocidal gas (gassing) to disinfect a whole room. This technique can be used to reduce the level of microorganisms in the air and on surfaces. Whole room disinfection can be used in addition to normal cleaning and disinfection practices but should not replace them.

Not all disinfectants are suitable for whole room disinfection using fogging (Table 1), including those recommended by WHO for control of SARS-CoV-2.

Table 1: Chemical disinfectants suitable for whole room fogging

Disinfectant	Suitability for fogging
QAC	Yes
Amphoteric	Yes
Biguanide	Yes
Iodophor	Partially
PAA	Partially
Alcohol	No
Chlorine	No

*Courtesy of CampdenBRI*

Hydrogen peroxide and ozone, both of which can be used for whole room disinfection in gaseous form, are effective against viruses, including the SARS coronavirus<sup>7,8</sup>.

### Use of microfiber for application of chemical disinfectants

If microfiber (both reuseable, and single use, disposable cloths and mops) is used in combination with a chemical disinfectant for SARS-CoV-2 control, the disinfectant should be one that is effective against viruses. These can either be applied directly to the surface and then wiped off with a mop/cloth or dosed onto the mop/cloth.

Note: Microfiber efficacy is based on the ability of the microfibers to attract and hold contamination through electrostatic (why dry) and capillary (when damp) action. The use of chemicals that contain alcohol, chlorine and strong acids and alkalis may damage the fibers and effect their efficacy.

### **Thermal disinfection**

Heat at 133°F can also be used to inactivate the SARS coronavirus<sup>10</sup>. Use wash/rinse water at >133°F for cleaning and disinfection, and steam disinfection after cleaning. Small, washable equipment and utensils can be decontaminated using an industrial or domestic dishwasher, with a wash cycle that utilises a minimum wash temperature of 133°F for a minimum of 15 minutes. Laundry or thermal equivalent (including protective clothing and cleaning cloths), and small washable cleaning tools and utensils can also be decontaminated by using a washing machine with the same minimum cycle settings.

### **Ultraviolet disinfection**

Short wavelength (264nm) UVC light has been shown to inactivate viruses but no studies have yet been conducted involving SARS-CoV-2.

### **Antimicrobial surfaces and equipment**

The antimicrobials impregnated into some surfaces and equipment may also serve to protect against virus transmission, but no studies have yet been conducted involving SARS-CoV-2. Surface antimicrobials work well on relatively clean surfaces but organic matter (e.g., food; biofilms; biological fluids) shields the virus from the antimicrobial. Importantly, they need time (hours) to work effectively, by which time the virus may have already be transferred. Standard cleaning and disinfection techniques are faster and more effective for minimizing the risk of virus transmission, especially for frequently touched surfaces.

### **What else can be done?**

Given the recent scientific findings that SARS-CoV-2 can survive on surfaces for 2-3 days, more frequent cleaning and disinfection of frequently touched surfaces, e.g., door handles; handrails; door push



plates; turnstiles; trolley and bucket handles; taps; hoses; cleaning tools and utensils is recommended, ideally after contact by each different individual. This cleaning and disinfection should also extend to surfaces in non-food handling areas such as toilets; changing rooms; offices; canteens; and vehicles. If an individual is diagnosed with COVID-19, it may be appropriate to additionally decontaminate all surfaces that the person could have come into contact with.

More frequent hand hygiene practices (washing; drying; use of appropriate hand sanitizer; use of disposable disinfectant wipes) are also recommended. An appropriate method for hand hygiene is shown in Appendix 1. Effective hand sanitizers include those containing at least 60% alcohol.

Companies and individuals may like to implement a disposable gloving policy. If this is done, careful consideration must be given to when the gloves are used and removed to ensure that the gloves themselves do not become a vector for viral transmission.

Gloving and the use of hand sanitizers/wipes should not replace good hand washing and drying practices.

Everyone should be aware of how they themselves could cause the spread of COVID-19 and of the precautions, recommended by WHO<sup>11</sup>, that they should take to minimize this,

- wash their hands regularly;
- cover their mouth and nose when coughing and sneezing
- avoid close contact (<2 meters) with anyone coughing and sneezing.

They should also understand the sources of contamination, i.e.,

- aerosols and droplets from coughing and sneezing; and
- surfaces,

and how transfer can occur,

- through inhalation of virus particles in aerosols and droplets;
- through transfer of virus particles from coughs, sneezes and surfaces to hands;
- from hands to mucus membranes (nose, mouth, eyes); and
- from hands back to surfaces.

Follow advice from trusted sources, including WHO (<https://www.who.int/>), and Government bodies. For example, the UK Government have recently issued the following Guidance to the food industry: <https://www.gov.uk/government/publications/covid-19-guidance-for-food-businesses/>

APPENDIX 1



## HOW TO WASH YOUR HANDS

PROTECT YOURSELF AND OTHERS AGAINST INFECTIONS



**1**

WET HANDS



**2**

APPLY SOAP



**3**

RUB HANDS  
PALM TO PALM



**4**

LATHER THE BACKS  
OF YOUR HANDS



**5**

SCRUB  
BETWEEN YOUR FINGERS



**6**

RUB THE BACKS  
OF FINGERS ON  
THE OPPOSING PALMS



**7**

CLEAN THUMBS



**8**

WASH FINGERNAILS  
AND FINGERTIPS



**9**

RINSE HANDS



**10**

DRY WITH  
A SINGLE USE TOWEL



**11**

USE THE TOWEL  
TO TURN OFF THE FAUCET



**12**

YOUR HANDS ARE CLEAN

### APPLICATION OF HAND SANITIZER





**1**

APPLY THE PRODUCT ON  
THE PALM OF ONE HAND



**2**

RUB HANDS TOGETHER



**3**

COVER ALL SURFACES  
UNTIL HANDS FEEL DRY  
(20 SEC)



**REFERENCES:**

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