

Key takeaways from Phase 2 and Phase 3.1 literature review

Phase 2 and Phase 3.1 literature reviews analyzed and summarized findings from available scientific literature on SARS-CoV-2 (the virus that causes COVID-19), focusing on studies of how the virus is spread, virus attenuation on commonly found materials, and effectiveness of prevention and decontamination measures.

HOW THE VIRUS SPREADS

The infectious dose (i.e., how much virus is needed to cause infection) remains unknown. More is understood about how the virus is transmitted. Track the “known unknowns” about the virus with the [DHS Master Question List for COVID-19](#).

Droplets. SARS-CoV-2 is generally understood to spread primarily through virus-containing water droplets expelled from infected persons from sneezes, coughs, speaking, and other respiratory activities. The virus can be transmitted by people who are asymptomatic or presymptomatic.

Other pathways for spreading the virus may include:

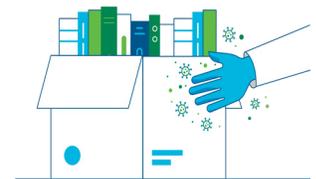
Aerosols:

Breathing air that the virus is suspended in, such as after an aerosolization event (e.g., a sneeze).



Fomites:

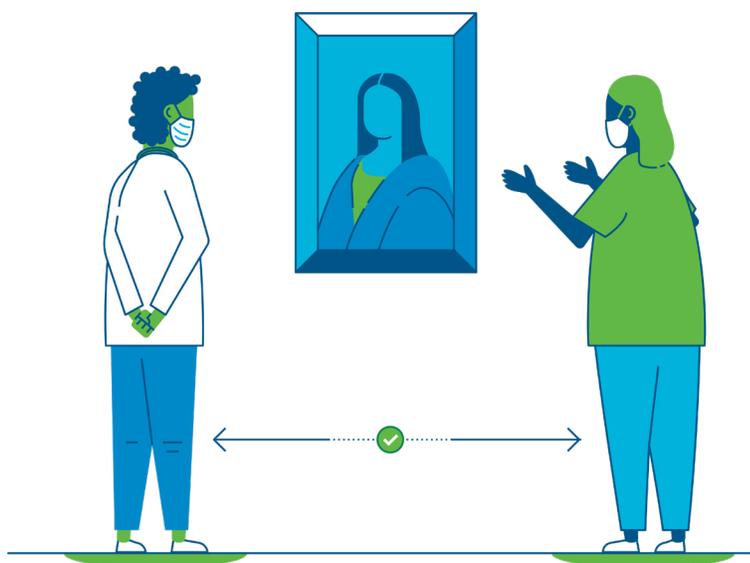
Touching objects that are contaminated with virus-containing droplets.



Environment. SARS-CoV-2 survives longer on surfaces in cold conditions, dry conditions, and dark conditions away from sunlight. SARS-CoV-2 dissipates on surfaces more quickly in hot conditions, humid conditions, and under direct sunlight.

Ventilation. Air heating/cooling systems and other air circulation mechanisms can contribute to spreading the virus through the air. On the other hand, poor ventilation may also lead to airborne virus remaining in indoor environments longer.

Indoor gatherings. Large indoor gatherings have been linked to SARS-CoV-2 outbreak clusters. Risk of transmission is increased by spending time with other people in indoor environments such as in an office, school, store, or restaurant.



Social distancing

Maintain a physical distance of at least 5.2–9.8 ft.

When possible, implement intermittent occupancy and schedule visits.

Factors that have been found to increase the spread of the virus:

- Settings with higher population density, with factors such as number of people per household, neighborhood housing density, multistory buildings, and limited access to green space and/or open sky.
- Increased exposure time in indoor environments where people congregate and interact, such as offices, restaurants, or choir practice spaces.
- Exposure to bathroom environments and shared plumbing used by infected people. Examples of shared plumbing may be found in office buildings, school dorms and apartment buildings, as well as in private homes.

What about food transmission? The Phase 3.1 literature review identified evidence suggesting that transmission via food, food packaging, or water (fresh, tap, or seawater) is not a significant risk, but more studies are likely needed to verify further.

Decontamination and prevention strategies

Researchers suggest several options for reducing the presence of SARS-CoV-2 in environments, which may help prevent transmission among people in those environments. This table has been updated to include findings from the Phase 3.1 literature review.

Strategy	Details
 <p>Cleaning hands</p>	<ul style="list-style-type: none"> Wash hands for 20 seconds from fingertip to forearm with soap and warm water Rub hands for 45 seconds with hand sanitizer that contains 80% volume/volume (v/v) ethanol or greater than 75% v/v isopropanol <p>Documented concerns with these cleaning agents include:</p> <p>Increased hand cleaning over time has been found to contribute to skin sensitivity and eczema. Protective skincare behaviors are needed for those who are washing their hands frequently.</p> <p>The formulations for most soaps and hand sanitizers are nonbiodegradable, can contribute to antimicrobial resistance, can be hazardous, and are toxic to both humans and the environment.</p>
<p>Mask wearing</p>	<ul style="list-style-type: none"> Wear face masks that cover the nose and mouth, such as medical and triple-layer cotton masks N95s and surgical masks have been demonstrated to be most effective Homemade masks should be laundered regularly Provide masks to all guests and staff
<p>Social distancing</p>	<ul style="list-style-type: none"> Maintain a physical distance of at least 5.2–9.8 ft When possible, implement intermittent occupancy and schedule visits
<p>Disinfecting</p>	<ul style="list-style-type: none"> Refer to the list of disinfectants and surface cleaners that meet the EPA's criteria for use against SARS-CoV-2

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Decontamination and prevention strategies, continued

Strategy	Details
<p>Heating and cooling systems</p>	<ul style="list-style-type: none"> • Use continuous air renewal from fresh outdoor air • Use UVC energy with HVAC systems • Use nickel filters with HVAC systems
<p>Ventilation</p>	<ul style="list-style-type: none"> • Use local air exhaust • Use high-efficiency particulate air (HEPA) and MERV 14 filters • Mix fresh outdoor air with existing air • Ensure cool air enters the room at floor level and exhausts at ceiling level • Use portable air cleaners with regularly cleaned HEPA filters (see CDC guidance on ventilation)
<p>UV light</p>	<ul style="list-style-type: none"> • Exposure to combined UVA/UVC light for 9 minutes • Exposure to pulsed-xenon UV for 1 minute <p>Using UV light to disinfect surfaces presents risks to staff and collections. Anyone considering the use of UV light as a disinfecting tool should follow current FDA guidelines and refer to other resources such as the REALM and NEDCC websites.</p>



For more information, view the REALM webinar *Collections and Facilities: Caring for Your Resources During COVID-19*.

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