

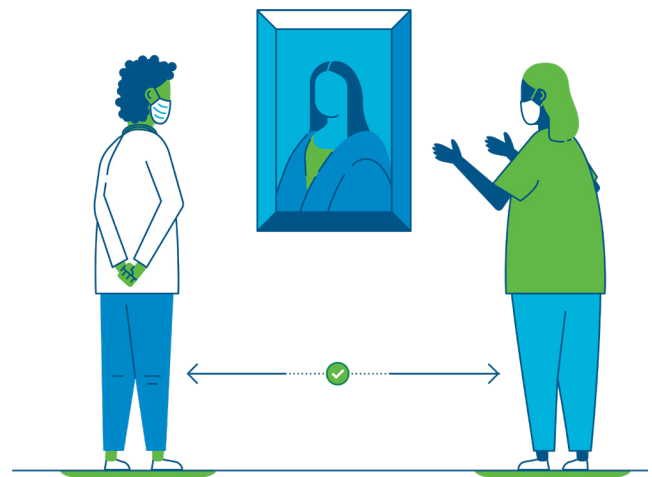
Ventilation

Battelle has completed a research briefing on scientific literature published through May 17, 2021, which focuses on SARS-CoV-2 vaccines, variants, and the effects of ventilation on virus spread. This overview document identifies several of the key research findings that are relevant to archives, libraries, and museums. Please see the **full research briefing** for details, citations, and links to references.

Ventilation as a COVID-19 mitigation strategy

Air purification or ventilation can drastically reduce the risk of infection when paired with other mitigation measures, such as mask wearing, occupancy restrictions, and surface cleaning. How effective ventilation is at reducing risk depends on several factors, including:

- Activities taking place in the space
- Number of infectious people in a space and their viral load
- How close infectious and susceptible people are to each other
- Air change rate, natural vs. mechanical ventilation, and presence of air filtration



Air purification

Air purifiers that use HEPA filters can eliminate more than 90% of aerosols. Air purifiers that use ionizers or ultraviolet germicidal irradiation have also been shown to be effective. Studies suggest it's best to place air purifiers on the ground in front of the source of aerosols (e.g., an infectious person).

HVAC systems

Well-designed HVAC systems can minimize the risk of SARS-CoV-2 transmission, while those that don't bring enough virus-free air into a space can make the situation worse. These HVAC system elements can help reduce spread:

- Displacement ventilation systems—these are designed to keep warm air at the top of the room and colder air at the bottom
- Using a MERV-13 filter (rather than a MERV-8 filter)
- Increasing the amount of outdoor air brought inside the space
- Multiple ventilation points in a room
- Incorporating UV-C light into duct systems (shown to inactivate 99.98% of virus in the air that passes through the duct)

Historic buildings and natural ventilation

HVAC is not always an option, especially for historic structures. Although it offers less control than an HVAC system, natural ventilation (i.e., bringing air in from outside by opening windows and doors) has been shown to decrease risk of transmission. When using natural ventilation, create a cross breeze by opening doors and windows on opposite sides of the structure.

During colder months consider using CO₂ sensors, which provide data on how stagnant the air is in a space. This can inform decisions about policies such as occupancy restrictions.

Current known unknowns about the impact of ventilation on COVID-19

More research is needed on these topics:

- How to best change or install ventilation systems to slow the spread of SARS-CoV-2
- How close air purifiers need to be to a source of virus particles to be effective
- Whether these mitigation techniques work just as well with new variants of the virus

Visit oclc.org/realms for full research briefings, project plans, test results, and new resources as they become available.

