Yes, COVID-19 is airborne.

Exhaled breath contains particles of varied size and mass which can carry virus: aerosols (microscopic and not readily visible) and droplets (large and visible).

Exhalation of aerosols: Aerosols are light enough to travel, stay afloat, and become infectious in enclosed spaces for many hours.

Virus-laden particles are most concentrated near the infected person. As long as we are sharing an airspace with someone else, breathing in the air that they exhale, airborne transmission is possible.

“Close-range transmission occurs when we inhale the breath exhaled by an infected person.”

Contact of mucous membranes by droplets: Droplets may directly contact the eyes, nose, or mouth, rather than being inhaled. Droplets may also spread to these areas from our hands after touching a droplet-contaminated surface.

But wait, there's more:

Room-scale transmission

With time, an infected person's virus-laden exhaled breath stays afloat in the air, permeates the room, and becomes more concentrated.

Aerosols (microscopic): Aerosols can travel longer distances. These particles disperse over the top or sides.

Circulation of air currents can also spread aerosols over longer distances.

“Aerosols are more infectious in enclosed spaces for many hours.”

Control room air conditions with:

Refresh, filter, or humidify shared air space (see tips below)

Maintain physical distance and limit crowding

Wear a well-fitted mask

Open doors and windows where possible

Limit occupancy and time spent in shared air spaces

To achieve an effective seal, make sure your mask does not leak air from the sides or bottom.

“Your mask is effective if it is snug fitting!”

Do-it-Yourself (DIY) Ideas

Mask filtration: Top 5

1. Surgical mask
2. KN95 or FFP2
3. N95 (if NIOSH Certified)
4. Double-mask (e.g., cloth over surgical)
5. Surgical mask (best fit achieved by a brace)

Coarse-scale aerosol filtration

- Use a HEPA air cleaner (DIY or purchased), sized appropriately for the room, to supplement ventilation.

Mask filtration

- It’s all about filtration and fit!
- Effective mask filtration reduces the amount of particles released into a shared space, creating a slug fit.
- To achieve a snug fit, make sure your mask does not leak air from the sides or bottom.

Where can I learn more?

- COVID Straight Talk: How to Make a DIY Air Filter
- FixTheMask: Get the most out of your surgical mask
- Ask This Old House: How to Make a DIY Air Filter
- CO2 Sensors: Which Type Should You Be Looking For?
- COVID-19 and Air Quality. City & County of San Francisco.
- Figure 4. Aerosol exposure to an exhaled breath from an infected person.
- Figure 5. Aerosol exposure to an exhaled breath from an infected person.

All sources are linked in each section for more information. For a full list of references, click here.

CONTROLLING COVID-19
AERIONAE EXPUIRE
PRACTICAL TOOLS TO PREVENT AIRBORNE TRANSMISSION RISKS

Adapted from Julian Tang, University of Leicester, UK

Virologist Dr. Julian Tang, University of Leicester, UK

Ways to prevent room-scale transmission, the more the better!

- Limit occupancy and time spent in air spaces
- Open doors and windows where possible
- Set HVAC system to bring in as much outside air as possible
- Install CO2 sensors to measure ventilation

Ways to prevent close-range transmission, the more the better!

- Wear a well-fitted mask
- Maintain physical distance and limit crowding
- Refresh, filter, or humidify shared air space

Inhalation of aerosols:

- Virus-laden particles are most concentrated near the infected person.
- Once in the air, viruses can travel further by dispersing over the top or sides.
- Inhaled viruses can spread to areas far from the infected person.

Inhalation of droplets:

- These droplets may directly contact the eyes, nose, or mouth, rather than being inhaled.
- Droplets may also spread to these areas from our hands after touching a droplet-contaminated surface.

With time, an infected person's virus-laden exhaled breath stays afloat in the air, permeates the room, and becomes more concentrated.

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