

Investigations

Military-grade camera shows risks of airborne coronavirus spread



By [Dalton Bennett](#), [Sarah Cahlan](#), [Daron Taylor](#)

DECEMBER 11, 2020



As winter approaches, the United States is grappling with a jaw-dropping surge in the number of novel [coronavirus](#) infections. More than 288,000 Americans have been killed by a virus that public

health officials now say can be spread through airborne transmission.

The virus spreads most commonly through close contact, scientists say. But under certain conditions, people farther than six feet apart can become infected by exposure to tiny droplets and particles exhaled by an infected person, the Centers for Disease Control and Prevention [said in October](#). Those droplets and particles can linger in the air for minutes to hours.

To visually illustrate the risk of airborne transmission in real time, The Washington Post used an infrared camera made by the company FLIR Systems that is capable of detecting exhaled breath. Numerous experts — epidemiologists, virologists and engineers — supported the notion of using exhalation as a conservative proxy to show potential transmission risk in various settings.

“The images are very, very telling,” said Rajat Mittal, a professor of mechanical engineering in Johns Hopkins University’s medical and engineering schools and an expert on virus transmission. “Getting two people and actually visualizing what’s happening between them, that’s very invaluable.”

The highly sensitive camera system detects variations in infrared radiation that are not visible to the naked eye. The technology is more typically used in military and industrial settings, such as detecting methane gas leaks in pipelines. In 2013, it was deployed by law enforcement during the 20-hour manhunt for the Boston Marathon bombers.

But fitted with a filter that specifically targets the infrared signature of carbon dioxide, the camera can be used to map in real time the partial path of the nearly invisible particles we exhale.

According to experts, the footage underrepresents the potential risk of exposure from airborne particles. Those particles may spread farther or linger longer than the visible exhalation plume, which dissipates quickly to a level of concentration the camera can no longer detect.

Infrared video of a woman wearing an unfitted surgical mask.

Environmental factors such as airflow in a space, wind and sunlight can reduce the chances of spread, as can such behavioral factors as mask-wearing and social distancing. The risk of exposure increases when people are not wearing masks and are close together in an enclosed space or in an area with poor ventilation.

Many of those circumstances will become more common as Americans increasingly spend time indoors in the coming months. [Watch the video at the top of the page to see footage from various settings.](#)

[Catch up on the biggest developments in the pandemic at the end of the day with our free coronavirus newsletter.](#)

[Follow @wpinvestigates on Twitter | Latest investigative news](#)

— *Elyse Samuels contributed to this report*

The latest: [How Kyle Rittenhouse and Joseph Rosenbaum crossed paths in Kenosha | Men tied to alleged plot to kidnap Michigan's governor attended multiple anti-lockdown protests](#)

[**Show More**](#)