

LETTERS

Treat COVID-19 as Though It Is Airborne: It May Be

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To the editor: As the coronavirus disease 2019 (COVID-19) pandemic continues, it is important to review the 3 main routes for person-to-person transmission of respiratory viruses. They are direct or indirect contact with an infected individual (eg, shaking hands, touching a contaminated doorknob), large droplets emitted by coughing and sneezing that land on the uninfected individual, or inhalation exposure to small airborne particles that remain aloft for minutes to hours after an infected individual exhales them. Several infectious diseases including viruses are transmissible opportunistically via the third, airborne route, such as severe acute respiratory syndrome–associated coronavirus (SARS-CoV).¹ Regarding the 2019 novel coronavirus (2019-nCoV, also called SARS-CoV-2), a virus closely related genetically to SARS-CoV, the recommendations of the World Health Organization (WHO) emphasize that the infection can be transmitted via direct contact and large droplets,² while suggesting reduced concern regarding the potential influence of the airborne route. The WHO states: “In the context of COVID-19, airborne transmission may be possible in specific circumstances and settings in which procedures or support treatments that generate aerosols are performed.” Although the degree

to which airborne transmission of even well-known respiratory viruses continues to be an active area of research, the WHO’s stance on a virus that was unknown only 4 months ago is surprising.

What definitive evidence gathered so early in the pandemic supported the assertion that COVID-19 airborne transmission is limited to specific circumstances and is not more generalized? To answer this question, we inspected each citation used in the WHO’s Scientific Brief² to back up its recommendations.³⁻⁹ Surprisingly, we did not find any definitive evidence supporting it. A common theme throughout several of the citations was a clear demonstration of person-to-person transmission without discussion of transmission route.^{3-5,7} In contrast, in another citation, the authors state, “We are concerned that 2019-nCoV could have acquired the ability for efficient human transmission... Airborne precautions, such as a fit-tested N95 respirator, and other personal protective equipment are strongly recommended.”^{6(p502)} Authors of another study, when listing knowledge gaps, included the “[r]ole of aerosol transmission in non-health care settings”,^{8(p36)} suggesting that the question of airborne transmission is unresolved. The final citation involved testing air samples and surfaces in hospital rooms where infected patients stayed, and the authors noted that air samples were negative for SARS-CoV-2 but, “Swabs taken from air exhaust outlets tested positive, suggesting that small virus-laden droplets may be

displaced by airflows and deposited on equipment such as vents”.^{9(pE2)} Theoretically, these same “small virus-laden droplets” could be inhaled by any persons who enter the room, thus facilitating airborne disease transmission.

A more recent report, not available to the WHO on the publication date of the Scientific Brief,² describes superspreading events associated with COVID-19.¹⁰ In an analysis of clusters of disease transmission in Japan, the authors observed that “all clusters were associated with closed environments... [and] the odds for transmission from a primary case-patient were 18.7 times higher than in open-air environments.” The fact that closed environments are more amenable to COVID-19 transmission relative to open-air ones is consistent with an infection that potentially is capable of airborne transmission. The COVID-19 pandemic is new, so there is little surprise that there is a lack of definitive evidence as to which route or routes are observed most commonly in viral transmission. To date, with the availability of only scarce data, prudence dictates continued consideration of airborne transmission of COVID-19 as an explanation for the rapid spread of the virus.

For the future, there is an urgent need to conduct systematic studies to assess the ability of the virus to spread through the air, whether via turbulent vapor clouds emitted during a cough or sneeze¹¹ or via virus exhalation during breathing by an infected individual.¹² For now, there is an immediate need to revisit

WHO recommendations that include the potential for airborne transmission, so that healthcare providers and others working and/or sharing indoor space with SARS-CoV-2–infected individuals are protected by the appropriate protocols.

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