(http://m.gc.cuny.edu)

New Study Calculates the Potential Travel Distance of Airborne Saliva Droplet

Researchers outline additional steps that could potentially reduce the risk of transmission of the novel coronavirus

NEW YORK, April 2, 2020 — Reacting to growing concerns over the potential for airborne transmission of the novel coronavirus that causes COVID-19, physicists with The Graduate Center, CUNY and Lehman College have released a paper (https://arxiv.org/abs/2003.13689) calculating the potential for saliva droplets, which can carry the virus, to travel distances greater than six feet. Their findings suggest that added precautions such as recommending that everyone cover their mouths with a close-weaved cloth barrier when in public and turn off air-forced heat and air conditioning to prevent circulating airborne droplets should be explored by public health officials as potential tactics for reducing this risk.

Researchers are still working to sort out the level of risk for contracting the current coronavirus through airborne exposure. The new study sheds light on one factor that may help scientists answer this question.

"Our calculations show that a large amount of droplets could evaporate before reaching the ground and this indicates the potential of airborne infection," said the paper's co-author Luis Anchordoqui, a physics professor

and researcher at The Graduate Center, CUNY and Lehman College. “The transmission of the COVID-19 disease, however, still depends on the infectious virus load carried by the droplets, which must be determined experimentally."

For their study, the research team used theoretical and computational techniques to determine the travel distance of airborne droplets, which may contain coronavirus. Droplets are produced whenever someone speaks, coughs, or sneezes. Larger ones will fall to the ground within six feet of the person who produces them. But smaller ones will become airborne, and size along with humidity and air circulation are factors in how long a virus inside a droplet can survive and travel. In rooms with air-forced heating and air conditioning systems—which are frequently used in office spaces, grocery stores, and other places of business—droplet particles can circulate continuously until evaporating. These findings could be useful in assessing the potential need for expanding existing social distancing recommendations and use of protective shielding, said the researchers.

“The advice we hear is that only people who work in hospitals should wear masks, but there may preventative value in having everyone cover their mouth to reduce the spread of droplets,” said study co-author Eugene Chudnovsky, a physics professor and researcher with The Graduate Center, CUNY and Lehman College. “N95 masks are really important for protecting people in hospital settings where a lot of infections are going around, but other kinds of masks—even a scarf around the mouth—might be useful to the general public in reducing the spread of droplets into the air.”

In the face of personal protective equipment shortages, the researchers intend for their findings to help public health policymakers in their decisions and recommendations for reducing the spread of the current coronavirus.

“We still have more to learn about the transmission of this particular coronavirus, but research conducted across a variety of scientific disciplines will be useful in informing how we combat this pandemic moving forward,” said Bruce Y. Lee, a longtime expert in infectious disease modeling and professor of health, policy, and management with the CUNY Graduate School of Public Health.

This research—published on Cornell University’s open-source platform for scholarly articles in the STEM field and supported by U.S. National Science Foundation and the Department of Energy’s Science Office—was produced in response to national science agencies’ call to action prompting scientists to quickly produce research that can help inform efforts to end the pandemic.

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