Exaggerated risk of transmission of COVID-19 by fomites

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A clinically significant risk of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) transmission by fomites (inanimate surfaces or objects) has been assumed on the basis of studies that have little resemblance to real-life scenarios.

The longest survival (6 days) of severe acute respiratory syndrome coronavirus (SARS-CoV) on surfaces was done by placing a very large initial virus titre sample (10^7 infectious virus particles) on the surface being tested.[1] Another study that claimed survival of 4 days used a similarly large sample (10^6 infectious virus particles) on the surface.[2] A report by van Doremalen and colleagues found survival of both SARS-CoV and SARS-CoV-2 of up to 2 days (on surfaces) and 3 days (in aerosols generated in the laboratory), but again with a large inoculum (10^5–10^7 infectious virus particles per mL in aerosols, 10^4 infectious virus particles on surfaces).[3] Yet another study found long survival (5 days) of human coronavirus 229E on surfaces with what I would still consider a substantially large viral load (10^3 plaque-forming units) in a cell lysate.[4] However, using a cell lysate rather than purified or semipurified virus might enable initial viral proliferation or protection from the effects of the sample drying out.

None of these studies present scenarios akin to real-life situations. Although I did not find measurements of coronavirus quantities in aerosol droplets from patients, the amount of influenza virus RNA in aerosols has been measured, with a concentration equivalent to 10–100 viral particles in a droplet, with even fewer infectious influenza virus particles capable of growth in a plaque assay.[5] By contrast, one study found human coronavirus 229E to survive for only 3 h, and human coronavirus OC43 to survive for 1 h, after drying on various surfaces including aluminum, sterile latex surgical gloves, and sterile sponges.[6] In a study in which the authors tried to mimic actual conditions in which a surface might be contaminated by a patient, no viable SARS-CoV was detected on surfaces.[7]

A 2020 literature review[8] included most of the studies I have cited here (and others), but adds no new research, and in my view, does not critically evaluate previously published studies. I am not disputing the findings of these studies, only the applicability to real life. For example, in the studies that used a sample of 10^7, 10^6, and 10^4 particles of infectious virus on a small surface area,[1–3] these concentrations are a lot higher than those in droplets in real-life situations, with the amount of virus actually deposited on surfaces likely to be several orders of magnitude smaller.[5] Hence, a real-life situation is better represented in the work of Dowell and colleagues[7] in which no viable virus was found on fomites.

In my opinion, the chance of transmission through inanimate surfaces is very small, and only in instances where an infected person coughs or sneezes on the surface, and someone else touches that surface soon after the cough or sneeze (within 1–2 h). I do not disagree with erring on the side of caution, but this can go to extremes not justified by the data. Although periodically disinfecting surfaces and use of gloves are reasonable precautions especially in hospitals, I believe that fomites that have not been in contact with an infected carrier for many hours do not pose a measurable risk of transmission in non-hospital settings. A more balanced perspective is needed to curb excesses that become counterproductive.

I declare no competing interests.

Emanuel Goldman
egoldman@njms.rutgers.edu

Professor of Microbiology, Biochemistry and Molecular Genetics, New Jersey Medical School - Rutgers University, Newark, NJ 07103, USA

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