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Modeling the risk of SARS-CoV-2 transmission from environmental surfaces. Preliminary report.

For over a year now, the coronavirus disease (COVID-19), has devastated worldwide causing the most destructive pandemic of the 21st century. Although direct transmission of SARS-CoV-2, the etiological agent of COVID-19, seems to be the dominant route of transmission, the contraction of the virus from various surfaces in the environment has emerged as a likely source of infection. Infected individuals shed virus into the environment through breathing, coughing and sneezing where the virus will remain in these environmental reservoirs and can potentially infect other susceptible individuals. In this study, we develop a transmission dynamics model as well as a model to estimate the probability of detecting SARS-CoV-2 in the environment during the COVID-19 outbreak within a community. We extend this model to quantify the contribution of environmental virus to COVID-19 cases. To validate our model, we use San Diego county case data as well as experimental data from a large number of swab samples collected from commonly touched and rarely disinfected surfaces across San Diego county. Our results indicate that the duration in which the virus persists on some environmental surfaces can significantly increases COVID-19 cases in a community. (Received March 09, 2021)