Rapid Reviews COVID-19

Review 2: "Longitudinal monitoring of SARS-CoV-2 RNA on high-touch surfaces in a community setting"

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RR:C19 Evidence Scale rating by reviewer:

- **Reliable.** The main study claims are generally justified by its methods and data. The results and conclusions are likely to be similar to the hypothetical ideal study. There are some minor caveats or limitations, but they would/do not change the major claims of the study. The study provides sufficient strength of evidence on its own that its main claims should be considered actionable, with some room for future revision.

Review:

The authors assayed for the presence of SARS-CoV-2 RNA on high-touch common surfaces in a community setting with the intent of assessing whether this might be useful for tracking the Covid-19 pandemic.

While the data might be of value in tracking the pandemic, it is even more important in that it shows how the possibility of catching Covid-19 from fomites (inanimate objects and surfaces) is very minor. The authors estimate the risk of infection from these surfaces to be less than 5 in 10,000. Actually, even that is clearly an overestimate, since their estimate was derived from detection of RNA and not from detection of infectious virus. Although not measured here, in other studies that assayed for both viral RNA and infectious virus, there were mostly no infectious virus particles detected even when viral RNA was present (more on this below).

When published, this paper will be a valuable addition to the literature on the Covid-19 pandemic. There are not a lot of studies published to date that assess the presence of viral RNA in the community.

A major criticism for the paper is that the authors are not consistently careful to add "RNA" after SARS-CoV-2. The work can easily be misleading when this is omitted. Portions of the text taken out of context could be misinterpreted as applying to the virus because of the authors omitting "RNA." For example, in the Abstract, the authors write "Twenty-nine of 348 (8.3 %) surface samples were positive for SARS-CoV-2, including crosswalk buttons, trash can handles, and door handles..." The authors MUST add "RNA" after SARS-CoV-2, otherwise the text could be easily misinterpreted to mean that actual virus was present. This issue comes up several more times throughout the text.

On the 4th line of the Introduction, the authors missed citing an important reference; another recent study showing no infectious virus on hospital surfaces should be added here:

[https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X\(20\)30532-2/fulltext](https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X(20)30532-2/fulltext)

The limitations concerning lab studies of SARS-CoV-2 survival on surfaces are insufficiently described. The authors casually refer to "initial concentration and environmental conditions," but manipulations to extend survival in the lab studies are more serious than that, including very large initial concentrations of virus, keeping the samples in the dark (UV light kills the virus), adding proteins to the virus like bovine serum albumen (which is known to protect the virus from decay), and maintaining optimal humidity and temperature.

While the authors acknowledge that they do not know the relationship between viral RNA measurements and infectious virus, they should also note that other studies have been unable to determine the relationship between viral RNA on surfaces and infectious virus. For example, La Scola and coworkers (<https://link.springer.com/article/10.1007/s10096-020-03913-9>) assayed both, but were not able to specify the relationship between viral RNA levels and infectious virus. They actually note "the virus could not be isolated after day 8 in spite of ongoing high viral loads of approximately 10⁵ RNA copies/mL of sample." Therefore, the estimates in the present manuscript reflect a maximal level of potential transmission, with the actual level certain to be much lower.

Overall, the paper has significant value but there are several limitations on its impact that could be repaired in a revision. I hope the authors do revise and improve this paper.