Reviewer’s report

Title: Contamination by respiratory viruses on outer surface of medical masks used by hospital healthcare workers

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Reviewer: Sen Pei

Reviewer's report:

This study explored the contamination by respiratory viruses on medical masks in hospital settings. Results suggest that masks worn for over 6 hours and by HCWs who examined over 25 patients per day have a significantly higher risk of contamination. This work contributes to the efforts in improving medical practices to control respiratory virus infection, and could be potentially used to guide better protocols on mask use. Here I have a few questions regarding the study and interpretation of the results.

1. In line 118, "Most particles were concentrated on upper right, middle and left sections of the masks". I am wondering how many experiments were performed to reach this conclusion. Does the direction or distance of spray affect the concentration area?

2. In pilot study 2 (clinical testing), 3 samples were positive for human enterovirus. Could authors report in which sections those viruses were found? Is it consistent with the finding in pilot study 1?

3. As the masks were only tested on the upper section, it would be better to stress in the abstract that the results were based on the data from the upper section. Other sections might be contaminated as well.

4. The internal medicine department has a much higher contamination rate. Is there any intuitive explanation? Does this imply different protocols should be applied in distinct departments?

5. Is there any particular reason to choose the 6-hour boundary? I am wondering if statistically significant difference could be obtained using other threshold values.

6. If the number of examined patients is available, it would be better to see a more refined correlation between positive cases and number of patients in more groups (instead of examining just two groups). Pertaining to the last question, how was the threshold of 25 patients per day selected?

7. A table of the collected information from participants would help readers to better understand the experiments. Some detailed information, for instance, variable name and type (categorical/numerical), should be reported.
8. Is there any clustering of a certain type of virus in a certain department? Or different types of virus appear in all three?

9. In lines 252 and 254, there seems to be a repetition of sentence.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

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