Reviewer's report

Title: Wearing Face Masks in Public During the Influenza Season May Reflect Other Positive Hygiene Practices in Japan

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Reviewer: Allison Aiello

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The purpose of this study was to assess associations between reported mask use and reported hygiene behaviors in a sample from Japan. The overall study is of interest given the common use of masks in Japan and developing public health recommendations regarding promotion of hygiene and mask use in the community setting before and during a pandemic. Although the manuscript is well-written and of interest, there are several weaknesses that should be addressed to strengthen the arguments presented in the manuscript.

1) The title is misleading because it sounds as if the efficacy of mask use is completely explained by other hygienic behaviors that reduce influenza in this population. We do not know the relative contribution of aerosol, droplet, and indirect contact transmission of influenza. Therefore, it is inaccurate to suggest that wearing a face mask is ineffective and that it reflects “other” hygiene measures that may be responsible for reducing influenza transmission.

2) The first sentence of the introduction is inaccurate. Even general surgical masks may provide some protection from larger droplet transmission and even hand contact transmission. Please see IOM report for a discussion of masks (Preventing Transmission of Pandemic Influenza and Other Viral Respiratory Diseases)

3) Introduction: Issues of confounding when wearing a face mask are primarily an issue for non-randomized studies. There have been several published randomized studies (even cited in this manuscript as well as the IOM report above) that show randomization to wearing surgical masks and layering with hand hygiene can significantly reduce influenza illness incidence and transmission. This has been shown in studies with relatively high compliance and overall low hygiene behaviors (students in the study by Aiello et al. JID and PloS One) and among household members with high compliance to mask wearing in the study by Cowling et al. in Hong Kong.

4) This issue of confounding is brought up again in the discussion “Given the intrinsic cultural aspects of hygiene and personal protective measures[10], future studies to assess the efficiency or effectiveness of wearing a mask should consider these hygiene measures as possible confounding factors.” Most public health authorities would argue that this is not confounding and that it is a layered effect (as shown in randomized studies mentioned above) of both masks and
hygiene together on influenza outcomes. Clearly, there is some protection for respiratory infections by hand hygiene (Aiello et al. American Journal of Public Health). Therefore, studies that control for other hygiene behaviors that are seeking to identify the impact of masks alone would not contribute to understanding how measures promoted by public health officials will reduce transmission of infection or how layering interventions together may promote health by preventing disease.

5) It is notoriously difficult for people to accurately recall their hygiene practices. There may be bias among people who wear masks since they may also be more inclined to report that they do all of the other hygienic practices at higher rates than individuals who report lower mask use. This is not clearly discussed in the limitations section of this manuscript.

6) The statement “Although the effectiveness of wearing a face mask for preventing infectious diseases has been investigated in various other studies [4, 6, 16-19], most have not considered the possible association between wearing a face mask and other hygiene practices.” is false. The randomized intervention studies on mask use funded by the CDC specifically called for an assessment of single and layered interventions (face masks alone and face masks and hand hygiene together). For example, in the Aiello et al studies, randomization worked properly such that the hand hygiene measures were not statistically significantly different in the mask only group versus the control group. Of course the mask with hand hygiene group was significantly different than the control group because part of their intervention was hand hygiene (subjects were given alcohol-based hand sanitizer and instructed to use it throughout the day).

7) The statement “In addition, compliance rates for wearing face masks have not been adequate to fully assess the effectiveness of this type of device [6, 7] ” is factually incorrect. Both the Cowling et al. studies and the studies by Aiello et al. had relatively high reported compliance rates.

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

None.