

Criticism of DK Chu et al. on face masks for COVID-19 by professor Joseph Audie

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Professor Joseph Audie wrote to OCLA's researcher Denis Rancourt on July 14, 2020, to describe his observations about the "Chu et al." article and its use by the WHO. Here is professor Audie's letter, published with permission.

Hello Dr. Rancourt,

My name is Joseph Audie. I am a professor of biochemistry and computational drug design researcher. I appreciate all of the excellent work you are doing researching matters related to COVID-19.

On April 5th, with respect to the mass use of face masks by the general public, the WHO wrote:

However, there is currently no evidence that wearing a mask (whether medical or other types) by healthy persons in the wider community setting, including universal community masking, can prevent them from infection with respiratory viruses, including COVID-19.

On June 5th, the WHO, citing the meta-analysis of DK Chu et al., wrote:

A recent meta-analysis of these observational studies, with the intrinsic biases of observational data, showed that either disposable surgical masks or reusable 12–16-layer cotton masks were associated with protection of healthy individuals within households and among contacts of cases.

I have identified fundamental errors in the DK Chu et al. meta-analysis that I want to bring to your attention.

Briefly, after reading your letter to the WHO, I decided to start reading the meta-analysis authored by DK Chu et al. which can be found at:

[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)31142-9/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31142-9/fulltext)

Figure 4 in the article lists numerous results from what are purported to be face mask versus no face mask studies. According to information provided in the figure, Wang et al. (2020 for COVID-19 – reference 70) reported a result that would favor face masks as a method for infection control:

Face mask data: events/face masks = 1/1286

No face mask data = events/no face masks = 119/4036

Given that the Wang et al. study was one of only a few that focused on COVID-19 and given the large number of subjects and magnitude of the reported effect, I decided to read the Wang et al. article:

<https://www.medrxiv.org/content/10.1101/2020.04.20.20064899v1.full.pdf>

The first thing to note is that the Wang article is a pre-print that appears to not have been subject to peer review. More importantly, the Wang et al. article does not report the aforementioned results as face mask versus no face mask but rather (in Table 2) reports the results as level 2 protection versus inadequate protection:

Level-2 protection = 1/1286

Inadequate protection = 119/4036

According to the Wang et al. article, level 2 protection is said to include: disposable hat, medical protective mask (N95 or higher standard), goggles (anti-fog) or protective mask (anti-fog), medical protective clothing or white coats covered by medical protective clothing, disposable gloves and disposable shoe covers.

Hence, the Chu et al. article appears to be misclassifying level-2 protection/inadequate protection results as face mask/no face mask results.

Moreover, the Wang article provides raw results in Table 1 that can actually be interpreted against the efficacy of face masks:

No protection: total infected without protection/total infected staff = 25/120 (20.8%)

Surgical mask: total infected with surgical mask/total infected staff = 94/120 (78.3%)

Finally, the Wang et al. article reports results on COVID-19 associated death outcomes that illustrate the limits of observational studies and the need for careful interpretation, especially as it pertains to the assignment of causation with implications for government policy. In the Wang et al. article, it is reported in Table 1 that one doctor died who worked in a hospital center that did not treat COVID-19 patients and that no doctors died in hospital centers that did treat COVID-19 patients. From this, are we to conclude that treating COVID-19 patients reduces COVID-19 mortality risk relative to treating non-COVID-19 patients? Obviously, this conclusion is absurd, and it focuses attention on the challenges of inferring causal relationships from observational studies. On a related note, the discussion of the doctor's death is totally inadequate and the calculated fatality rate of 0.8% may be misleading.

In summary, the DK Chu et al. article erroneously includes and reports results from the Wang et al. article for level-2 protection versus inadequate protection as results for face mask versus no face mask. Additionally, the Wang et al. study actually reports data, ignored by Chu et al., for surgical mask versus no protection (no surgical mask) that could be interpreted against surgical mask (face mask) efficacy. Finally, the Wang et al. article reports on a single COVID-19 associated death that can be used to spotlight the

limitations of observational studies. These errors are of a fundamental nature and, if confirmed, call into question the entire article and any policy recommendations that derive from it.