Letter to the Editor

RE: COVID-19 and healthcare workers: A systematic review and meta-analysis

To The Editor,

We read with great interest the newly published report by Gholami and colleagues about COVID-19 in healthcare workers (HCWs) (Gholami et al., 2021). The report represents a new addition to a number of systematic reviews about the risk of COVID-19 among HCWs at a global level. Nevertheless, we believe that the percentage of positive COVID-19 testing calculated by the study and referred to as "prevalence" is extremely inaccurate and misleading.

As per the authors, the percentage of positive COVID-19 testing was estimated at 51.7% after combining data from 28 studies including 119,883 HCWs. However, using the data presented in Table 1, the percentage of positive COVID-19 testing should be 11.7% (14,047 of 119,842 HCWs) not 51.7%. Additionally, the denominators of the two reports that contributed 78% of the positive HCWs included in the study were inaccurately recorded (Zheng et al., 2020; CDC COVID-19 Response Team, 2020). For example, the denominator of the study by Zheng et al. that was recorded as 2,457 HCWs in Table 1 was estimated at 117,100 HCWs in the original study, with an overall prevalence 2.1% (Zheng et al., 2020). Similarly, the denominator of the study by the US Centers for Disease Control and Prevention (CDC) that was recorded as 8,495 HCWs in Table 1 was not actually defined in the original report (CDC COVID-19 Response Team, 2020). The report estimated the percentage of positive HCWs out of all positive COVID-19 results (19%) and not the HCW force in the USA, which is estimated to be >18 million HCWs. Therefore, the CDC report is probably unsuitable for inclusion in prevalence calculation. If the prevalence was recalculated after fixing the denominator of the study by Zheng and colleagues (Zheng et al., 2020) and removing the CDC report (CDC COVID-19 Response Team, 2020), the true prevalence would be further reduced to 2.5% (5,552 of 223,083 HCWs).

The overestimation of COVID-19 positivity was repeated to some extent in the rates of hospitalization and mortality reported by Gholami and colleagues (Gholami et al., 2021). Using the data presented in Table 6, the rates of hospitalization and mortality should be 8.2% and 0.6%, not 15.1% and 1.5%, respectively. Additionally, 18% of the hospitalization data and 33% of mortality data presented in Table 6 were derived from early Chinese studies that included only hospitalized or dead HCWs, respectively, and were therefore unsuitable for inclusion in a prevalence calculation. Additionally, the denominator was wrongly recorded in some studies (Zhan et al., 2020; Wang et al., 2020). For example, the denominator for the 23 deaths in

the study by Zhan and colleagues was 3,387; therefore, the mortality was actually 0.7%, not 100% as mentioned in Table 6 (Zhan et al., 2020). Removing studies that did not report denominators and fixing the wrong denominator would result in further reductions in the true rates of hospitalization and mortality to 6.8% and 0.4%, respectively.

Finally, future systematic reviews and meta-analysis on COVID-19 morbidity and mortality among HCWs should clearly differentiate between studies using reverse-transcription polymerase chain reaction (RT-PCR) and antibody testing (IgM and IgG) for confirming cases. Furthermore, the data should be separately presented for symptomatic, asymptomatic and exposed HCWs.

Contributions

AE: literature search, analysis, and writing; MA: literature search and writing.

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Conflict of interest

The authors declare no conflicts of interest.

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