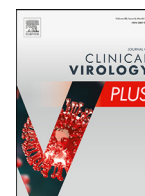




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## Post-COVID-19 vaccination absolute risk to front line health care workers



Dear Editor,

The COVID-19 vaccines now available result in a remarkable roughly 95% reduction in risk of developing COVID-19. One challenge is to estimate the absolute risk to vaccinated front line health care workers (HCWs), who have been shown to have a particularly high risk even with improved personal protective equipment, due to the dramatic increase of exposure borne by this group.

Moncunill et al. recently reported that at the Hospital Clinic de Barcelona in Spain, during the COVID-19 pandemic first peak in spring 2020 the prevalence of infection among health care workers (HCWs) was 11.2% but in just the one month that followed the first peak, 5% of uninfected HCWs became infected at that hospital, despite the availability of improved personal protective equipment (PPE). Had the new remarkably effective COVID-19 vaccines been available (estimated 95% relative risk reduction), for that same single month, the absolute risk would have been closer to 5% -  $(0.95 \times 5\%) = 0.25\%$  or roughly 1 in 400 likelihood of contracting the virus for HCWs [1].

In the United States estimating the absolute risk with vaccination to front line HCWs is also challenging due to surging exposures to front line HCWs. Based on studying 2315,195 people during the first months of the pandemic, Nguyen et al. estimated the risk of the average person contracting COVID-19 to be 0.26% and the risk to front line HCWs to be 3.4 x higher or 0.88% in the US and Britain [2]. Shah et al. reported a nearly 5-fold increase in hospital admission for COVID-19 for healthcare workers and their households, but again their data preceded the most recent surge in the US, and was from Scotland [3].

In recent months front line HCWs in the US are being exposed to far more infected patients so that even with more aggressive PPE use, one would anticipate considerably higher risk to each front line HCW compared to the general population. If, for example, the risk to a front

line HCW without vaccination is 5 times higher during the current surge than it was during the first surge, than the absolute risk to a front line HCW would be  $5 \times 0.88\% = 4.4\%$ , given the Nguyen data [2]. With vaccines offering a 95% risk reduction, the risk to such a worker, once vaccinated, might now be  $4.4\% - (0.95 \times 4.4\%) = 0.22\%$  or roughly 1 in 480. The challenge lies in estimating the risk to a front line HCW during the current surge and underscores the conclusion by Moncunill et al. of the “critical” importance of surveillance in HCWs, despite the highly effective vaccines, in order to estimate the absolute risk of contracting COVID-19 for this group [1].

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### Declaration of Competing Interest

There are no conflicts of interest related to this correspondence.

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