

Review of "Smoking, vaping and hospitalization for COVID-19"

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(1) Statistical Analysis. The authors should consider revising their statistical analysis, removing the individual study expected : observed analysis, since we do not know the correct expected rates in the individual studies and the local populations that the hospitals served. Instead, the pooled rates across all studies should be compared with national prevalence estimates in the hope that the prevalence rates in all the populations served might approximate the national rate. The authors attempt this rather crudely by summing the 6 rates as if from the same population. There is considerable heterogeneity across the studies, suggesting different populations and rates. The random effect pooled smoking rate estimate is 6.2% (2.8% to 10.9%). The national estimates from the latest WHO report appear slightly different to those given by the authors. They are: 52.9% (50.6% to 55.2%) for males and 2.4% (1.9% to 3.1%) for females. The authors might check these. More important than any minor difference is that the authors' analysis assumes the estimates to be without survey error, and this needs to be taken into account when calculating the expected number of smokers. Even if the data are re-analysed more appropriately as described above, there is little doubt that there will remain strong evidence that the recorded smoking rates are considerably lower than national rates.

(2) Male : Female ratio. If we accept that the observed smoking rate is only about a third to a fifth of the expected rate the implication is that smoking is protective, rather than being a risk factor for serious COVID-19 symptoms. Based on this premise, a clear contradiction is seen in the data presented. Given the national smoking prevalence (i.e. protective) rates of about 50% in men and 2% in women, we would expect men to comprise only about 30-40% of those hospitalized, not the 57% reported across the 6 studies. There would need to be significant sex-related confounders involved to explain this discrepancy.

(3) Smoking status. There are many potential confounders that might explain these data, as noted by other reviewers and acknowledged by the authors. Aside from these, there must be a serious question about the recording of "current smoking". No details are

given on this and it is difficult to believe it was done in a systematic and rigorous way in these clinical circumstances. Complete and accurate recording of smoking status may not have been a priority? Hence, there must be a strong possibility that underreporting or recording of smoking is the likely explanation for these apparently contradictory data.