Additional considerations for assessing COVID-19 impact on dengue transmission – Authors' reply

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Christina Yek and colleagues raise two additional considerations when interpreting our recent findings that COVID-19 interventions reduced dengue incidence in 2020 [1]. First, whether administrative delays may be an additional, unconsidered, dimension to underreporting and second, whether the inclusion of abnormal data from 2019 may bias our predictions of cases averted.

Disruption induced administrative delays in reporting are plausible and would have led fewer dengue cases being reported in 2020. To minimise this, we restricted our analysis to January-December 2020, despite more recent data being available. Searches for data were last updated on 2nd Feb 2022 and no delay-related changes were identified compared to the original searches from 23rd Feb 2021. If administrative delays did occur in 2020, they were likely quickly rectified before early 2021. Furthermore, our case-fatality-based underreporting analysis would likely have detected underreporting due to administrative delays if they had occurred. Many dengue endemic countries, e.g. Sri Lanka, have separate reporting procedures for suspected dengue deaths that involve distinct rapid reporting channels that are regularly audited [2]. Delays in reporting dengue cases but not deaths would result in higher case fatality rates which we did not detect for any country.

We also agree that 2019 was an abnormally high incidence year for dengue and that, like in previous post outbreak years (e.g. 2017 in Brazil), would have resulted in below average incidence in 2020 even in the absence of COVID-19 interventions. These post outbreak reductions are likely due to a combination of viral (e.g. genotype replacement, as suggested), mosquito (e.g. successful vector control) and host (e.g. rising immunity to circulating viruses) factors that may differ between outbreaks, but have a consistent effect of suppression[3,4]. The "annual anomaly" term in our model estimates this expected post-outbreak reduction. While 2019 was an unprecedented year for dengue globally, many countries have experienced comparable outbreaks previously (see figure S18 in [1]), allowed annual anomaly effects to be appropriately estimated. Inclusion of this term decreases predicted cases in 2020 and, thus, cases averted by COVID-19 interventions. Removing 2019 dengue data from the historical model fitting dataset, as suggested, therefore minorly increases our estimate of dengue cases averted by COVID-19 interventions but also substantially increases prediction uncertainty

(0·76 million, 95% credible interval [CI] 0·00–2.23 vs 0·72 million, 95% CI 0·12–1·47). We therefore believe the original estimates presented in Chen et al.[1] offer the best overall estimate of the protective effects of COVID-19 interventions against dengue.

References

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