Review 2: "Remarkable Variability in SARS-CoV-2 Antibodies across Brazilian Regions: Report on Two Successive Nationwide Serological Household Surveys"

Lee W. Riley¹

¹UC Berkeley Division of Infectious Disease and Vaccinology

Published on: Aug 20, 2020

DOI: 10.21428/2e3983f5.b4530cf4

License: [Creative Commons Attribution 4.0 International License \(CC-BY 4.0\)](https://creativecommons.org/licenses/by/4.0/)

RR:C19 Evidence Scale rating by reviewer:

- **Strong.** The main study claims are very well-justified by the data and analytic methods used. There is little room for doubt that the study produced has very similar results and conclusions as compared with the hypothetical ideal study. The study's main claims should be considered conclusive and actionable without reservation.

Review:

This report describes a two-phased national serosurvey of SARS-CoV2 infection in Brazil. It is geographically the largest, population-based serosurvey conducted to date, and also the first from a southern hemisphere country, where the epidemic has yet to reach its peak. While the main findings are not unexpected, the study makes several important contributions to our understanding of the epidemiology of Covid-19, as follows:

1. This is one of only two large-scale population-based national serosurveys reported to date, Spain being the other.
2. The seroprevalence in children vs older groups in the first phase was not significantly different and it was slightly lower in the second survey. The results contribute to addressing the debate concerning the frequency of infection in children. It would have been interesting to estimate the attack rate of symptomatic infections in children based on this observation.
3. The use of a point-of-care lateral-flow assay made possible rapid and large-scale collection of serology data.
4. The study provided detailed data on seroprevalence by sociodemographic differences. Although not discussed in the paper, such observations could be used to target mitigation efforts.

This is a very carefully executed study conducted under multiple challenging circumstances, including skepticism of the country's president, disinformation in the social media, and lockdowns. The investigators first validated the commercial point-of-contact finger-stick lateral flow assay, and adjusted the seroprevalence frequency

results by the test's accuracy. Although the number of subjects surveyed per site were small, the investigator used a multistage sampling method in which the households were randomly selected. Detailed statistical methods are described in the supplement. The authors acknowledge the limitations of the study, but the large-scale nature of the study across 133 sentinel cities showed internal consistency, indicating reliability of the findings. Some questions raised in the study were not addressed however:

1. It is not explained why the significant decrease in seroprevalence over the two surveys occurred only on Breve. Their suggestion that the decrease in antibody levels has been reported by others does not explain why this was observed only in Breve.
2. The investigators collected data on social distancing measures and use of masks, but the seroprevalence results were not reported according to these parameters.

In summary, this study provides valuable baseline data regarding the early stages of the Covid-19 epidemic. It provides an opportunity to later assess the impact of varied mitigation efforts when a similarly-designed survey is conducted after the epidemic declines in Brazil. I recommend publishing this paper.