SARS-CoV-2 Seroprevalence Data to Guide Local Public Health Interventions

To the Editor  Bajema et al1 report jurisdiction-level serologic prevalence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) antibodies. Such results, however, have limited value at the local and county levels, as national and jurisdictional seroprevalence data do not specifically address the heterogeneity within each state and county. That distinction is meaningful, as the spread of the coronavirus disease 2019 (COVID-19) pandemic appears to be highly heterogeneous.2 In fact, the epidemiology of SARS-CoV-2 infection within each area appears to be confined to specific counties that are likely hot spots of localized spread.3

A complex set of factors likely contributes to such heterogeneous spread of SARS-CoV-2 including, for example, household density and workforce characteristics. Interventions should be targeted to the specific factors and environments that drive infection. Such interventions will inherently be informed by prevalence data, and, for that, estimates at the local level are needed. The methods used by Bajema et al do not provide the granular detail required to give local policy makers the necessary tools to develop targeted interventions. Similar to studies regarding sexually transmitted infections, in which prevalence estimates differ greatly in different populations,4 local survey data, even household survey data, are important to understand the frequency and distribution of infection.

The US Centers for Disease Control and Prevention should develop, fund, and implement a framework for local SARS-CoV-2 surveillance that includes community-based surveys, local prevalence estimates, and methods to monitor the epidemiology of infection. Given the magnitude of the socioeconomic consequences arising from blanket closures in the wake of the COVID-19 pandemic,5 such guidance should be provided expeditiously. At local levels, the prevalence of infection may be higher in specific hot spots. In such hot spots, public health interventions may have the greatest effects and relatively less societal harm.

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Factors Contributing to Missing COVID-19 Cases During Contact Tracing

To the Editor  We read with great interest the recently published article by Sachdev and colleagues1 detailing the outcomes of contact tracing for patients with the novel coronavirus disease 2019 (COVID-19). The goal of contact tracing is to identify and promptly quarantine individuals exposed to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus causing COVID-19, to prevent onward transmission. The authors highlight key limitations of this process in their study, including delays in testing and contact notification, and report secondary cases in only 10% of the exposed population traced. This finding is unexpectedly low and serves to undermine the efficacy of contact tracing, as secondary attack rates are hypothesized to be up to 29% in household contacts2 and up to 5% in social settings, workplaces, and schools.3 We believe there are at least 2 important factors that may have contributed to the low secondary case detection rate observed in this study,1 both of which warrant consideration.

First, the authors1 report the median time to contact testing after the patient’s symptom onset; however, a more useful measure to report would be time to contact testing since the last date of exposure. Optimizing the timing of testing according to days since last exposure is crucial to avoid false-negative results. Often, contacts require retesting at a later point in the incubation period to confirm the absence of infection. The probability of a false-negative result is highest in the 4-day period following exposure ranging from approximately 100% on day 1 to 67% on day 4—and lowest on day 8 (20%).4 Testing during windows in which the probability of false negatives is high can lead to artificially lower secondary infection rates.

Second, the authors1 do not discuss whether symptom monitoring of exposed contacts occurred to detect probable cases. Individuals who meet clinical criteria for COVID-19 and who have an epidemiologic connection (ie, they had close contact to persons with COVID-19 in the 14 days prior) are defined as having probable cases and should be isolated, tested, and interviewed as such.5 Given the high probability of false-negative results in this context, health departments must also rely on symptom monitoring of exposed contacts to ensure probable cases are promptly identified and managed. Taken together, we believe consideration of proactive symptom monitoring and precise timing of testing of exposed contacts is necessary to fully understand the utility of contact tracing.
In Reply We agree with Rich and colleagues that our analysis\(^1\) may underestimate secondary cases of coronavirus disease 2019 (COVID-19) due to challenges in optimally timing severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) testing during quarantine. Based on modeling data, ideally contacts are notified and tested soon after their initial exposure (to identify already infected individuals and ensure prompt contact tracing for those individuals) and again at the end of quarantine (to maximize cases identified).\(^2\) However, currently this is operationally difficult to implement in the US given strains on testing capacity, unpredictable delays in receiving test results, and lack of access to low-barrier, rapid-turnaround SARS-CoV-2 testing.

Limited data are available regarding the proportion and timeliness of contacts tested in the US. Between August and October 2020, the proportion of named contacts in San Francisco who tested positive during quarantine increased to 48% (from 38% in May), and secondary cases identified increased to 13% (from 10% in May). Of note, there was wide variation in secondary case detection by race/ethnicity; test positivity among Latino contacts was 21% compared with 8% among White contacts.\(^3\)

Peak viral load and transmission risk occur in a narrow window prior to and after symptom onset (ie, 2 days before and 5 days following symptom onset).\(^4\) According to contact tracing data from the San Francisco Department of Health, household contacts in San Francisco with sustained contact with an individual who has tested positive accounted for 75% of named contacts and 90% of secondary cases. As of October 2020, the median time from case symptom onset to contact testing was 5 days (interquartile range [IQR], 3-7 days), which represents a 7-day lag between when an individual became infectious (and initially exposed household contacts) and contact testing. While the median time from last exposure to contact testing was 3 days (IQR, 1-6 days), this short interval may underestimate contact positivity for nonhousehold contacts with a single exposure to an infected person. Given known tracing delays, we continue to recommend immediate testing of all contacts to promptly isolate secondary cases, and subsequently, their contacts.

All contacts are offered the opportunity to participate in a short message service monitoring program. Contacts who opt in receive a daily text message enquiring about symptoms; if they report symptoms, they receive a phone call and are referred for testing. Approximately 40% of notified contacts currently opt in to this service, again highlighting real-world challenges and underscoring the need for additional tools to improve compliance to quarantine and testing recommendations.

We agree that the ideal state would be to ensure that all contacts are tested at the end of their quarantine period. The ultimate effectiveness of contact tracing, however, relies on rapid detection and isolation of secondary cases and the willingness of infected individuals and contacts to engage in the process. Given the disproportionate burden of disease among vulnerable populations, the narrow window to intervene in transmission, and the lack of technologies available to ascertain and instantaneously notify close contacts, achievable goals for health departments tasked with implementing contact tracing programs must be defined.

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