

# COVID-19 antibody testing needn't be perfect to guide public health and policy decisions

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While it's too soon to use COVID-19 antibody testing to issue "immunity passports", antibody tests that are available today are good enough to

inform decisions about public health and relaxing social distancing interventions, says an international group of infectious disease and public health experts in *Science Immunology* today.

"We don't need to wait for the perfect [test](#) to monitor populations. We can use what we have if we go in with our eyes open," says University of Utah Health infectious disease physician-researcher Daniel Leung, M.D. He is corresponding author on the editorial together with specialists from seven different countries and leading [public health](#) institutions in the U.S., including Johns Hopkins Bloomberg School of Public Health, Harvard School of Public Health, University of California, San Francisco and Pennsylvania State University.

## **Today's Tests are Ready for Populations, Not People**

Some have suggested that detecting [antibodies](#) to SARS-CoV-2—the coronavirus that causes COVID-19—become the basis of "immunity passports" that enable people to return to work or school, or to travel. Yet, facts indicate that it is premature to take that step. For one, scientists have yet to determine whether the antibodies, or perhaps a threshold level of antibodies, protect a person from being re-infected. For another, there are multiple antibody tests, none with the levels of specificity needed to declare someone immune.

In short, we are far from being at a place where a positive antibody test guarantees that a person cannot get COVID-19 nor spread it to someone else, the authors say. And the stakes are too high to risk getting it wrong.

Regardless, these same tests are good enough to monitor the spread of COVID-19 in populations. "There is no need to throw out the baby with the bathwater," says Leung. "We can use serological testing at the [population](#) level to get valuable information about transmission and the impact of interventions, and we don't need a perfect serology test to do

it."

Understanding trends such as where outbreaks are occurring and which regions are quiet, and the characteristics of who is getting ill and who is protected, can provide information to guide policy. Is a specific county ready to ease restrictions? Are students safe to go back to school? Do certain populations need extra protection?

## **Fine-Tuning Existing Tests to Meet Different Needs**

One reason many of today's tests can work for public-level decisions is that they do not just give black and white answers. Instead, their parameters can be adjusted to fit different needs. One of these characteristics is specificity—how well a test detects antibodies to SARS-CoV-2 and not to antibodies against other coronaviruses. The other is sensitivity—the minimum level of antibodies someone must have in their blood in order to test positive.

In general, there is a tradeoff between the two. Adjusting a test to prioritize sensitivity makes it not as specific, and making a test more specific makes it less sensitive. But it's ok to sacrifice one for the other in order to answer certain questions, the editorial says.

Take the situation in a rural countryside where relatively few people have had COVID-19 per capita. In that setting, a test with [high sensitivity](#) and low specificity would not be optimal. These characteristics could easily result in the same number of people testing positive who never had COVID-19 as the number of people who really are positive. In this situation, the results would be practically meaningless.

However, the same test can be used if it is tuned for that situation. This can be done by designating a higher cutoff and saying that a test does not

count as positive unless it has a stronger signal. Doing so lowers the false positive rate by increasing specificity. In this scenario, positive tests are more likely to be truly positive and that data can be safely used to monitor that population.

On the other hand, an urban setting where higher proportions of the population have been infected would do better with a test prioritized for higher sensitivity. That would give a better snapshot of the spread of COVID-19 by capturing a greater segment of the population.

Additional studies will only make the results of antibody testing more informative. The editorial specifies that we still need to understand whether antibodies remain in the body for months or years, what levels of antibodies provide immunity, and how responses might differ in people who had various severity of infection, or who have other medical conditions.

The authors say that equally as important as leveraging the technologies at hand is building an infrastructure that allows states and countries to share protocols, standardize methods, share results and coordinate activities. This would not only improve the response to the current pandemic but could build a foundation for monitoring other infectious diseases including influenza, cholera, malaria and future pandemics.

The editorial sums up the advantages that stand to be gained. "The current crisis presents an opportunity to rethink how health systems generate and use surveillance data and how to harness the power of serological tests and seroepidemiology."

**More information:** Serology for SARS-CoV-2: Apprehensions, opportunities, and the path forward, *Science Immunology* 19 May 2020: Vol. 5, Issue 47, eabc6347 , [DOI: 10.1126/sciimmunol.abc6347](https://doi.org/10.1126/sciimmunol.abc6347) , [immunology.sciencemag.org/content/5/47/eabc6347](https://immunology.sciencemag.org/content/5/47/eabc6347)

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