# *How Accurate Are Virus Tests? Ohio Governor's Results Show Positives and Negatives*

With testing delays nationwide, experts are increasingly recommending a new type of rapid test that gives less accurate results. It is imperfect, but as one expert put it, "pretty good is a lot better than none."

By Sarah Mervosh

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Gov. Mike DeWine of Ohio received a negative coronavirus test result on Thursday, hours after a positive test result had stopped him from meeting with President Trump in Cleveland. The contradictory results during a high-profile moment underscored the challenges of testing, an issue that has repeatedly stymied the virus response in the United States.

"I'm sure the internet is lighting up with, 'Well, you can't believe any test,'" Mr. DeWine, a Republican, said during an interview with 92.3 WCOL, a Columbus radio station, on Friday.

"No one should take the results of this test and say, 'Oh, none of these numbers are right,'" he added. "There is always a possibility for error."

At issue are two types of coronavirus tests that are increasingly taking center stage as part of the virus response in the United States. As part of a screening by the White House, Mr. DeWine first received an antigen test, a newer type of test that provides faster results but is less accurate than traditional laboratory testing. He was later tested using a more standard procedure known as polymerase chain reaction, or P.C.R., an accurate but time-intensive method that requires samples to be processed at a laboratory.

Widespread, fast testing is the cornerstone of any virus response and an area where the United States has consistently fallen short. In order to ramp up testing to a level needed to stop the spread of the virus, experts are increasingly recommending a strategy that casts a wide net with widespread adoption of faster, less accurate tests. But that comes with drawbacks.



To better understand the difference between the two types of tests and the accuracy of testing overall, we spoke with Dr. Bill Miller, an epidemiologist at the Ohio State University.

## What is the difference between a P.C.R. test and an antigen test?

A P.C.R. test is the test that is probably most familiar to Americans. It involves taking a swab from a person's nose and sending the sample to a laboratory to process.

The approach amplifies a sequence of nucleic acids in order to detect tiny amounts of the virus. Because the process amplifies the sequence, the test is highly accurate, but the results can take hours or days to process. "It allows you to get very high sensitivity, meaning most people who have the virus who have a P.C.R. test are going to get identified," Dr. Miller said.

But there have been problems with access to the tests. As cases spiked, the demand overwhelmed laboratories, and shortages in the supply chain meant many Americans had to wait days — or even weeks — for results. The delays render the tests largely useless. Experts say results are needed within 24 to 48 hours to effectively quarantine and contact trace. In the United States, turnaround times are often stretching three to five days, or more.

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Antigen tests look for a protein that is a part of the virus. They can also be done using a nasal swab, but can provide faster, easy-to-decipher results, similar to a pregnancy test.

Antigen tests can provide results in less than an hour. But because the process does not amplify particles, Dr. Miller said "the ability to detect the virus is lower by definition."

## How accurate are the results?

All virus tests have the possibility of an inaccurate result. "It is just a fact of clinical testing," said Dr. Miller, who recommended using common sense about the risk of exposure when evaluating unexpected results.

But antigen tests are generally less sensitive and less accurate than the traditional nasal swab, laboratory test. Interestingly, antigen tests are more likely to produce false negatives — missing someone who has the virus — than false positives, the opposite of what appears to have happened to Mr. DeWine.

Mr. DeWine is expected to be tested again on Saturday.

States are increasingly turning to antigen tests as part of a strategy to ramp up testing. Mr. DeWine is part of a bipartisan group of governors — four Republicans and four Democrats — who are negotiating to purchase the tests from two medical companies, Becton, Dickinson & Company and the Quidel Corporation. The companies were the first to receive emergency authorization for antigen tests from the Food and Drug Administration, but the tests could produce false negative results between 15 and 20 percent of the time.

## If the results are not always accurate, why are experts pushing for more rapid testing?

The United States is currently testing at a daily rate of 241 tests per 100,000 people, according to an estimate by Harvard Global Health Institute. By the same estimate, the country would need 355 tests per 100,000 people to slow the spread of the virus, and more than 1,000 tests per 100,000 people to truly suppress the virus by detecting and responding to outbreaks as they occur.

To ramp up enough testing, experts say the United States cannot rely on traditional one-by-one laboratory tests alone.

Antigen tests offer one strategy that could prove useful for crowded settings like nursing homes or schools. "You have the advantage of being able to quickly identify people who might be infected and getting them isolated and separated," Dr. Miller said. "Whereas where you have to wait 48 or 72 hours for a test result to come back, you have that window of time where people are often not fully isolated or quarantined."

In short, there are societal benefits to casting a wide net with faster, less accurate tests, but it can cause confusion on a personal level, as the DeWine case seems to show.

Speaking from his home in Cedarville, Ohio, on Friday, Mr. DeWine said it had been “quite a big shock” to be told that he had tested positive. He recalled that after receiving the news, he and his wife, Fran, came back home. “Fran fixed me some chicken and rice soup,” he said. “She thought we were settled in for the long haul here.”

But by Thursday evening, he had received better news.

“The antigen tests do give us a cheap way to do a lot of tests that are pretty good,” Dr. Miller said. “Pretty good is a lot better than none, and it collectively gets us a lot closer to the goal of being able to isolate and quarantine people when they need to be.”

Julie Bosman contributed reporting.

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