



## Serologic Testing for COVID-19

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The science and treatment of COVID19 are constantly evolving. Public Health experts are now confident that PCR testing (oral or nasal swab) is the best tool to identify the infection. Simultaneously, there is beginning to be a rapid development of serologic testing or antibody testing available in our community. Although only a handful of tests have been approved by the FDA through an Emergency Use Authorization (EUA), hundreds more are in the pipeline. A rapid test that is relatively painless (e.g. a finger stick or blood draw) that shows if an individual has or has had a coronavirus infection is ideal. Unfortunately, none of the currently available serologic tests can be used to confirm an active infection. ONLY the PCR testing is available to diagnose acute infections.

The best a serologic test can do is measure whether or not an individual has antibodies (e.g. IgM, IgG or IgA). The available serologic tests are currently being evaluated for their accuracy in determining the presence of antibodies. Two measurements, called sensitivity (true positive) or specificity (true negative), are used to determine accuracy based on a defined set of positive and negative samples. Generally, accuracy ranges from 80% to 98%; the higher the number, the more sensitive (e.g. able to measure true positives) and more specific (e.g. able to measure to true negatives). The opposite of those measures are false positives and false negatives.

Further, if the COVID19 disease is highly prevalent (e.g. very common in the community), then the positive predictive value is higher (e.g. more likely that a positive test is a true positive). If the prevalence is lower, then the predictive value is lower (e.g. more false positive tests). Here are the latest CDC guidelines for COVID19 antibody testing [www.cdc.gov/coronavirus/2019-ncov/lab/resources/antibody-tests-guidelines.html?deliveryName=USCDC\\_2067-DM29085](http://www.cdc.gov/coronavirus/2019-ncov/lab/resources/antibody-tests-guidelines.html?deliveryName=USCDC_2067-DM29085)

### **Practical Application**

Because there is low prevalence of 2019 coronavirus in the population, it's likely too early to expect an accurate result from serologic testing. It is also difficult to interpret the results, as discussed below.

If a person receives a **positive** serologic test and it is a true positive it indicates that they are likely to have produced some immunity. It takes about 1-3 weeks before antibodies are produced in response to the infection; however, it is not yet known how long that immunity lasts or if the person may still be infectious. If the person has symptoms and has a recent exposure to a COVID 19 person, PPE would still be needed to protect an individual who receives a positive serologic test, as well as each of the people they have had close contact with. They would also still need a PCR test and to follow appropriate guidance for isolation or quarantine. If their PCR test was negative the individual would still need to quarantine if they believed they had been exposed to someone with COVID-19.

A **negative** serologic test, on the other hand, does not assure that the individual does not have the virus. The infection, if the virus is incubating, may be too early to produce antibodies or the person might not produce them at all. PPE would still be recommended to protect the individual and those they come in contact with. If the person develops symptoms – generally 5-7 days after they’re exposed – a PCR test would still be needed to confirm the result and the individual would need to quarantine until the PCR results are available. Based on the results of the PCR test, the person may be required to isolate.

It is prudent to consider serologic testing in a “cross-sectional study” looking for the prevalence of the infection in our community or to participate in focused cross-sectional studies in special populations like health care workers or first responders. Boulder County Public Health will monitor the collaboration between Colorado State University (CSU) and Larimer County Public Health focused on helping to determine who may be immune or who may be susceptible. We will work closely with both entities to evaluate new serologic tests and may consider cross-sectional studies in Boulder County in the future. We are also exploring other ways to gauge prevalence in our communities, such as wastewater testing which can serve as a warning sign of increase virus prevalence.

