



## Coronavirus Disease 2019 (COVID-19)

# COVID-19 Serology Surveillance Strategy

Updated May 17, 2020

CDC is working with state, local, territorial, academic, and commercial partners to better understand COVID-19 in the United States. CDC has an overarching strategy for learning more about how many people have been infected with SARS-CoV-2, the virus that causes COVID-19, and how it is spreading through the U.S. population. This strategy includes using [serology testing](#) for surveillance to better understand how many infections with SARS-CoV-2 have occurred:

**Serology tests** look for antibodies in the blood.

**Antibodies** are proteins that can fight off infections.

- At different points in time,
- In different locations, and
- Within different populations in the United States.

### CDC Seroprevalence Survey Types

CDC is collaborating with public health and private partners on a variety of surveys of different sizes, locations, populations studied, and purposes. The seroprevalence surveys CDC is conducting include:

- [Large-scale Geographic Seroprevalence Surveys](#)
- [Community-level Seroprevalence Surveys](#)
- [Special Populations Seroprevalence Surveys](#)

Serology tests look for antibodies in blood. If antibodies are found, that means there has been a previous infection. Antibodies are proteins that can fight off infections. Investigations using serology testing are called seroprevalence surveys. CDC is collaborating with public health and private partners on a variety of seroprevalence surveys of different sizes, locations, populations studied, and purposes. The seroprevalence surveys CDC is conducting include large-scale geographic surveys, community level surveys, and smaller-scale surveys focusing on specific populations in order to learn more about COVID-19.

## Objectives of Surveillance of U.S. Serology Testing

- To provide a more complete estimate of how common COVID-19 is (or the incidence of infection)
- To guide control measures, such as social distancing

# Serology testing surveillance provides important information

A key CDC priority is to track COVID-19 infections to determine how much of the U.S. population is infected over time. CDC uses a variety of surveillance systems to track COVID-19 cases based on people who seek medical care. However, these systems can miss infections that occur in people who had mild or asymptomatic illness (i.e., no signs or symptoms) who did not seek medical care or get tested.

By using seroprevalence surveys, CDC can learn about the total number of people that have been infected, including those infections that might have been missed. These surveys also can help estimate how much of the population has not yet been infected, helping public health officials plan for future healthcare needs. These surveys can also track how infections progress through the population over time. This is done by taking “snap shots” of the percentage of people who have antibodies against SARS-CoV-2 (also called the seroprevalence) at different time points.

Seroprevalence surveys also can look at [risk factors](#) for disease, such as a person’s age, location, or underlying health conditions. Finally, some kinds of seroprevalence surveys can determine how long antibodies last in people’s bodies following infection.

## Questions CDC **wants to answer** through Serology Surveillance

- How much of the U.S. population has been infected with the virus causing COVID-19 (SARS-CoV-2)?
- How is this changing over time?
- Are there different characteristics, or [risk factors](#), that are associated with SARS-CoV-2 infection, such as age, location, or underlying health conditions?
- How many U.S. residents experienced mild or asymptomatic COVID-19 illness?
- How long can antibodies be found after a COVID-19 infection?

## Questions CDC **cannot answer** through Serology Surveillance

- How much of the U.S. population is immune to COVID-19 and not able to get infected again?
- How many antibodies are needed to protect someone from COVID-19?
- How long will someone with antibodies be protected from COVID-19?
- Can you be re-infected with COVID-19?
- Can people with antibodies return to work?

# Serology tests look for antibodies

Serology surveillance starts with the use of serology tests in people selected from a population. A blood sample is collected, and the [serology test](#) is used to look for antibodies in the blood sample.

## What a Positive serology test results mean?

### **Positive serology test results mean a past or recent infection**

When antibodies are found (a positive test result), it means that a person was infected with SARS-CoV-2 and their body's immune system responded to the virus at some point in the past. People develop antibodies when their body's immune system responds to an infection. These antibodies can be found in the blood of people previously infected whether or not they had signs or symptoms of illness.

**Note:** It can take 1–2 weeks after the first symptoms appear for antibodies to develop in the body. Since it often takes about a week for symptoms to appear after getting infected with SARS-CoV-2, antibodies could develop about 2-3 weeks after infection. This means serology tests may not detect current SARS-CoV-2 infections and should not be used to diagnose current COVID-19.

## What a Negative serology test results mean?

### **Negative serology test results have more than one meaning**

When a serology test does not find antibodies (that is, when the result is negative), there are several possible meanings, so interpreting how someone acts on these results is critical. Sometimes a negative serology result means that the person was not infected. However, it can also mean that infection occurred, but how the body's immune system responded was not strong enough to make enough antibodies, or that there has not been enough time for antibodies to develop (which can take 1–2 weeks after someone is infected to develop in the body). CDC has [information on test results](#) and on the CDC serology test on the [Serology Testing for COVID-19 page](#).

## Information on COVID-19 Testing

[Testing for COVID-19](#)

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[Test for Past Infection](#)

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[FAQs on Testing](#)

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[Information for Healthcare Providers on Evaluation & Testing](#)

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[Information on CDC Serology Testing Lab Work](#)

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[FAQs for Laboratorians on Serology](#)

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[Viral Testing Data in the U.S.](#)

## More Information

[COVIDView Weekly Summary](#)

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[Assessing Risk Factors](#)

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[FAQ Data & Surveillance](#)

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[Hospitalization Surveillance Network COVID-NET](#)

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