



Coronavirus Disease 2019 (COVID-19)

COVID-19 Serology Surveillance Strategy

Updated April 28, 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.

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.

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.

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.

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](#).

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?

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 surveys, community level surveys, and smaller-scale surveys focusing on specific populations in order to learn information about COVID-19.



Large-scale Geographic Seroprevalence Surveys

The largest surveys that CDC is conducting are called “large-scale geographic seroprevalence surveys.” These surveys are being conducted in locations across the United States and are first focusing on areas highly impacted by COVID-19, such as Washington State and New York State, including New York City. Large-scale surveys may perform serology testing on additional blood samples that were originally used for other purposes (e.g., routine cholesterol test). No names are linked to the blood samples used in these surveys. This means the identity and privacy of people whose blood is tested is protected. One limitation of these surveys is that people tested are not necessarily representative of the population for that area.



Community-level Seroprevalence Surveys

These surveys cover smaller areas than a “large-scale geographic survey.” They sample from select counties, and within this area, the selection of participants is completed in a systematic way. This allows for a more representative population to be tested where results might apply to other similar populations. CDC is working with state and county health departments to learn more about how COVID-19 is spreading in communities by performing serology tests in households in various communities.



Special Populations Seroprevalence Surveys

These seroprevalence surveys answer questions about specific populations, such as healthcare workers or pregnant women. Because they examine samples from a specific population, their findings cannot necessarily be applied to other populations. However, such surveys can help answer important questions about the risk of infection within specific populations.

Frequently Asked Questions: Learn more about laboratory testing including if you should be tested, where to get tested, and other basics on [COVID-19 diagnostic and serology testing](#).

Resources

[Testing for COVID-19](#)

[COVID-19 Data & Surveillance FAQ](#)

[CDC Serology Testing for COVID-19](#)

[Assessing Risk Factors for Severe COVID-19 Illness](#)

[Cases in the U.S.](#)

Page last reviewed: April 28, 2020

Content source: National Center for Immunization and Respiratory Diseases (NCIRD), Division of Viral Diseases