

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

Deidre S. Gifford, MD, MPH
Acting Commissioner



Ned Lamont
Governor
Susan Bysiewicz
Lt. Governor

What is Whole Genome Sequencing for SARS-CoV-2?

Viruses like SARS-CoV-2, the virus that causes COVID-19, change over time. It is important to monitor changes in the virus to understand how COVID-19 is changing and might affect our health differently. One way to do this is to perform Whole Genome Sequencing (WGS).

What is genomic surveillance?

Genomic surveillance is a tool used for monitoring changes over time in different organisms, including bacteria, fungi and viruses, and how those changes might impact the characteristics of the disease it causes. One method of genomic surveillance is WGS. WGS is a method that describes the nucleic acid (DNA/RNA) sequence of an organism at a given moment in time.

WGS has been an important tool during the COVID-19 pandemic for monitoring the SARS-CoV-2 virus. The uses of WGS include:

- Monitoring for the development of new variants
- Understanding how virus changes impact disease characteristics including severity of disease, transmissibility, response to treatments and vaccines and virus detection
- Identifying potential outbreaks

How is genomic surveillance conducted?

DPH has been working with the Yale University School of Public Health and Jackson Laboratories to conduct WGS on positive SARS-CoV-2 specimens. The DPH laboratory is also performing WGS on specimens obtained from hospital laboratories or as part of outbreak or case investigations. The Centers for Disease Control and Prevention (CDC) has also been working with commercial laboratories throughout the country to perform WGS on a sample of specimens. WGS is a labor-intensive process that usually takes at least one week, and sometimes more, to complete.

How is WGS information shared?

According to current Medicare and Medicaid Services (CMS) [guidance](#), surveillance testing using WGS to identify SARS-CoV-2 variants can be performed in a facility that is not Clinical Laboratory Improvement Amendments (CLIA) certified, provided that patient-specific results are not reported to (1) the individual who was tested or (2) their health care provider. If at any time a facility intends to perform testing on identified specimens and report a patient-specific SARS-



Phone: (860) 509-7995 • Fax: (860) 509-7910
Telecommunications Relay Service 7-1-1
410 Capitol Avenue, P.O. Box 340308
Hartford, Connecticut 06134-0308
www.ct.gov/dph
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CoV-2 variant test result to the individual who was tested or their health care provider, the facility must comply with CLIA and is thereby required to obtain the appropriate CLIA certificate in accordance with 42 CFR Park 493, laboratory requirements.

Most laboratories performing WGS on specimens from Connecticut residents (including laboratories in Connecticut) are not CLIA-certified or using a CLIA-based assay. WGS information is being reported to DPH as part of public health surveillance. DPH and local health departments might share information with healthcare providers or individuals on a case-by-case basis as part of a case or outbreak investigation. In general, WGS information on an individual person's specimen does not impact the care or treatment of that individual.

Laboratories performing WGS are encouraged to share the sequence of each virus to the Global Initiative for Sharing Avian Influenza Data (GISAID). GISAID is a global science initiative established in 2008 that provides open-access to genomic data of influenza viruses and the SARS-CoV-2 virus responsible for the COVID-19 pandemic. GISAID provides the ability to monitor all variants of the SARS-CoV-2 virus that are circulating and might be identified in the future. More information about GISAID can be found at [GISAID - Initiative](#).

Can WGS be used in outbreak investigations?

WGS and other genotyping methods have been used as part of outbreak investigations for many years. WGS information can be used to strengthen understanding of transmission when viruses from different cases are found to match and can also be used to rule out transmission when viruses don't match. DPH has been working to obtain and integrate WGS information on COVID-19 outbreaks since August 2020, when it is available. As with other information collected during outbreak investigations, WGS information is not routinely shared back with individual persons or entities where outbreaks have occurred. Specific WGS information is not necessary to implement control measures or recommendations in outbreak investigations

Where can genomic surveillance information be found?

For information on how the Centers for Disease Control and Prevention is monitoring changes in the SARS-CoV-2 virus: [Surveillance for SARS-CoV-2 Variants | CDC](#)

Information on SARS-CoV-2 variants circulating in the United States can be found here: [CDC COVID Data Tracker](#)

Information on surveillance for SARS-CoV-2 variants in Connecticut are published in the Thursday COVID-19 weekly report: [COVID-19 DPH Reports Library | Connecticut Data](#)