The New York City Department of Health and Mental Hygiene Links COVID-19 Epidemiologic Data with Whole Genome Sequencing Data to Track Emerging Variants and Disease Severity

CSTE

Stories FROM THE Field

CONTRIBUTOR: *New York City Department of Health and Mental Hygiene*

CATEGORY: Interoperable Data Systems

In March 2021, the NYC Health Department began routinely linking COVID-19 epidemiological data with whole genome sequencing (WGS) data to track emerging variants and assess differences in patient outcomes by variant in NYC.

The "What"

The NYC Health Department matches WGS data to its COVID-19 surveillance database, Citywide Immunization Registry, health information exchanges and eVital's death registry to compare the demographic characteristics, vaccination statuses and health outcomes of people infected with different COVID-19 variants over time to understand how emerging variants affect different populations in NYC.

For more information on this activity, visit:

- https://www.cdc.gov/mmwr/volumes/70/wr/mm7019e1.htm
- onlinelibrary.wiley.com/doi/10.1111/irv.13062
- https://www.cdc.gov/mmwr/volumes/72/wr/mm7208a4.htm

The "So What"

By linking COVID-19 epidemiological data with WGS data, the NYC Health Department can monitor emerging variants in NYC and determine if they cause more severe outcomes. The COVID-19 variant surveillance system also allows the NYC Health Department to share findings on emerging variants with other U.S. health departments whose capacity to access and link data sources may vary due to limited resources. Early data from the COVID-19 variant surveillance system showed no difference in disease severity among patients infected with the Omicron subvariant XBB.1.5 compared with patients infected with the previously predominant Omicron subvariant BQ.1. Because NYC witnessed the emergence of XBB.1.5 before much of the U.S. and had a robust COVID-19 variant surveillance system in place, the NYC Health Department was able to characterize this subvariant and share relevant findings in a timely manner.

The "Now What"

The NYC Health Department's COVID-19 variant surveillance system is a result of investments in public health data and informatics. This established surveillance system has been extended to other organisms, such as mpox, to link epidemiological data with WGS data. However, with the Pandemic Response Laboratory, NYC's primary source of sequenced SARS-CoV-2 specimens, closing in 2022, the NYC Health Department has had to use fewer sequenced specimens to monitor trends of emerging COVID-19 variants. Fewer sequenced SARS-CoV-2 specimens may prevent the NYC Health Department from detecting emerging variants in a timely manner and may not represent trends citywide.

The impending decline of COVID-19 resources has highlighted the importance of having consistent funding to supply SARS-CoV-2 specimens for sequencing to detect emerging variants, interpret citywide trends and compare emerging variants over time. The NYC Health Department requires funding to partner with:

- Sequencing labs to provide representative SARS-CoV-2 specimens

- Health care systems to increase data access to better characterize disease severity and support strong informatics systems

Together, these resources allow NYC to continue to have a robust COVID-19 variant surveillance program.