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Emerging Viral Diseases

Division of Infectious
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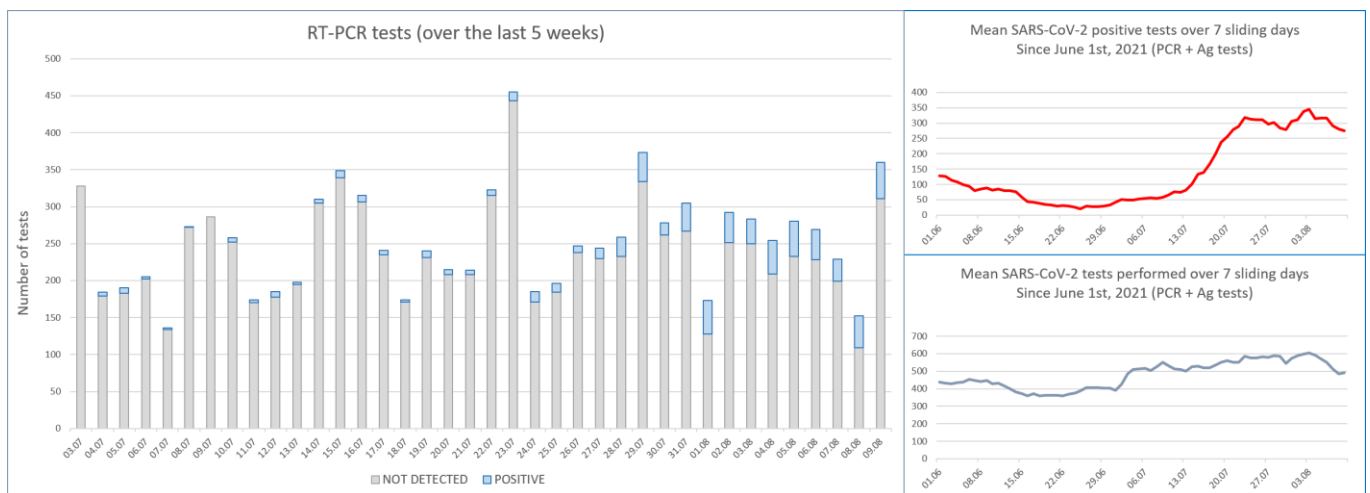
Division of Laboratory
Medicine

Diagnostic Department

SARS-CoV-2 genomic and variants surveillance in Geneva: weekly update

The laboratory of virology of the Geneva University Hospitals as a sentinel site for the Geneva area

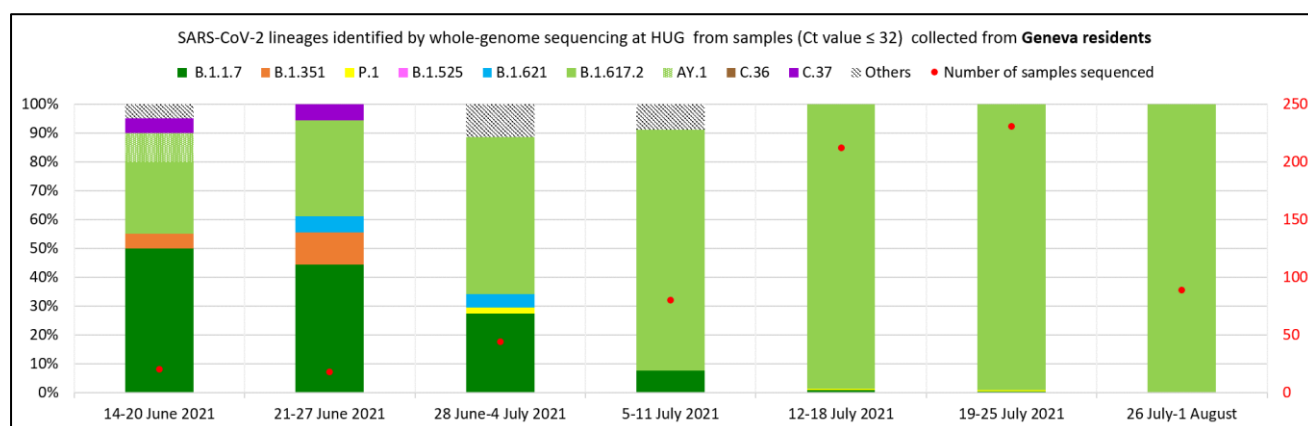
The number of tests (PCR and antigen tests) performed at the laboratory of virology of Geneva University Hospitals represents around 1/4 of the total number of tests performed in the canton of Geneva during week 31 (3395/12851). Roughly 37% of the positive specimens collected in the Geneva area were processed at HUG (N=281/767). WGS is carried out in close collaboration with the Health 2030 Genome Center in Geneva and Philippe Le Mercier from the Swiss Institute of Bioinformatics. Since March 1, 2021, the sequencing has been done within the Swiss national SARS-CoV-2 genomic and variants surveillance program. All specimens with a Ct value ≤ 32 are sequenced. In some instances, sequencing can be done on specimens sent by other laboratories in Switzerland. Phylogenetic analysis data are produced by Nextstrain, in collaboration with Richard Neher's group at the University of Basel. The number of positive tests in the canton and the total number of tests done during the surveilled week come from the website of the Direction Générale de la Santé in Geneva (available at <https://infocovid.smc.unige.ch/>), accessed August 10, at 10:00 am.



Tests performed at our outpatient testing center (located in the Hospital but open to anyone from the community) are either PCR-based or antigen-based. Most symptomatic patients are screened by RT-PCR and all positive antigen-based tests are confirmed by PCR, allowing screening for variants

The numbers of weekly positive cases diagnosed at HUG, as well as the mean positivity rate have been stable over the last 3 weeks (mean positivity rate of 8.5% during week 31). However, the positivity rate of patients screened by RT-PCR increased over the last 2 weeks, reflecting an increase of the positivity rate among symptomatic patients. Indeed, when considering only symptomatic patients tested at the dedicated outpatient department (secteur E'), the mean positivity rate was on average 36% over the last week.

SARS-CoV-2 lineages identified by whole-genome sequencing at HUG from samples (Ct value ≤32) collected from Geneva residents



Results of WGS of 694 sequences submitted to GISAID between June 14 and August 1st, 2021.
 Note: AY.1 (dashed light green) is the sublineage of B.1.617.2 (Delta) with the additional 417N mutation

All the 89 samples (100%) collected from Geneva residents between July 26 and August 1st have been confirmed by sequencing to be the Delta variant. Of those, 87 were collected at Geneva University Hospitals. The other specimens were collected in other Geneva-based laboratories and then sent to HUG for sequencing, at the request of the Cantonal Physician team.

Post-vaccination infections

Post-vaccination infection is defined here as a positive SARS-CoV-2 test occurring more than 14 days after the second vaccine dose. This surveillance is done in collaboration with the Direction Générale de la Santé (DGS) of Geneva. Data are collected by the DGS of Geneva during contact tracing calls after having obtained informed consent from SARS-CoV-2 positive patients. The list of patients with post-vaccination infections is sent weekly to HUG virology laboratory, which makes an effort to retrieve initial diagnostic samples in order to ensure sequencing, as recommended by FOPH.

The absolute number of positive cases identified as post-vaccination infections is still low, with a trend towards an increase in the number and proportion of positive cases identified as post-vaccination infections among positive cases over the last 3 weeks. 10% of the 778 cases reported by the Direction Générale de la Santé in Geneva over week 31 have been identified as post-vaccination infections for sequencing. Those numbers are expected given existing data on mRNA vaccine effectiveness against infection by the Delta variant. Most positive tests (90%) occurred in non-vaccinated individuals.

Conclusions

- The positivity rate among symptomatic outpatients tested at HUG remains high, at 36% on average over the last 7 days. This high positivity rate in this population is a signal that the virus is widely circulating in the community.
- The laboratory stopped the systematic screening of positive cases for the 452R mutation on July 29, 2021. Surveillance is still ongoing by WGS, and specific mutation screening will resume according to local epidemiology when necessary.
- WGS confirmed that it has almost exclusively been the B.1.617.2 (Delta) variant circulating in the Geneva area since mid-July.
- Most positive tests (90%) occurred in non-vaccinated individuals, and around 10% of SARS-CoV-2 cases were identified as breakthrough infections after vaccination during week 31 in the canton of Geneva. Those numbers are expected given existing data on mRNA vaccine effectiveness against infection by the Delta variant. There is a trend towards an increase in post-vaccination infections among identified positive cases over the last 3 weeks.
- The absolute number of hospitalized people has continued to progressively and slowly increase since the beginning of July, 2021, reaching 28 as of August, 10, 2021. The vast majority are not vaccinated.



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