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Geneva Centre for  
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Division of Infectious  
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Department of Medicine

Laboratory of virology

Division of Laboratory  
Medicine

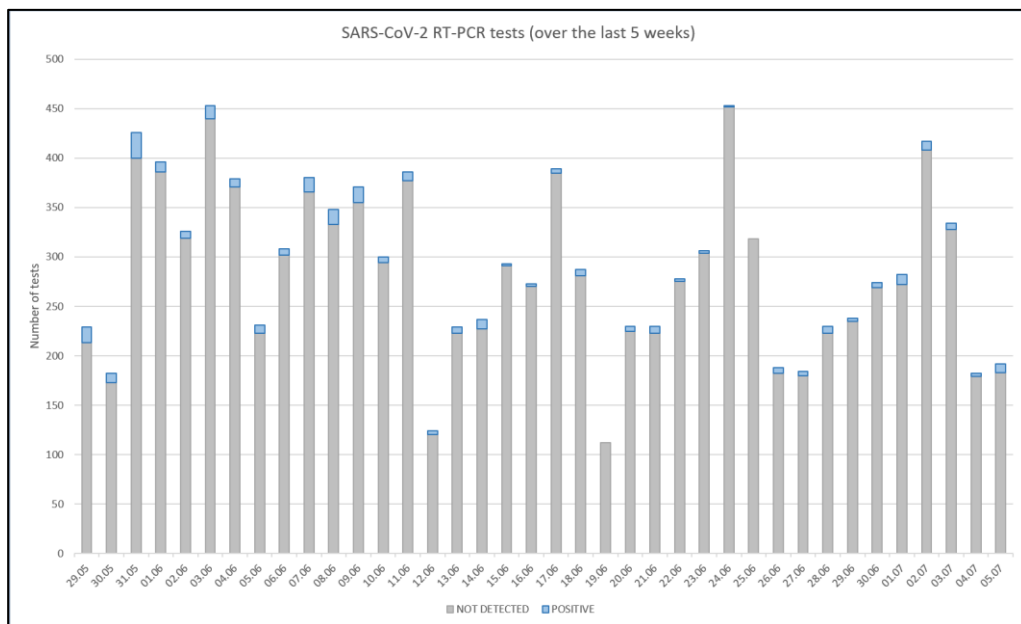
Diagnostic Department

**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**

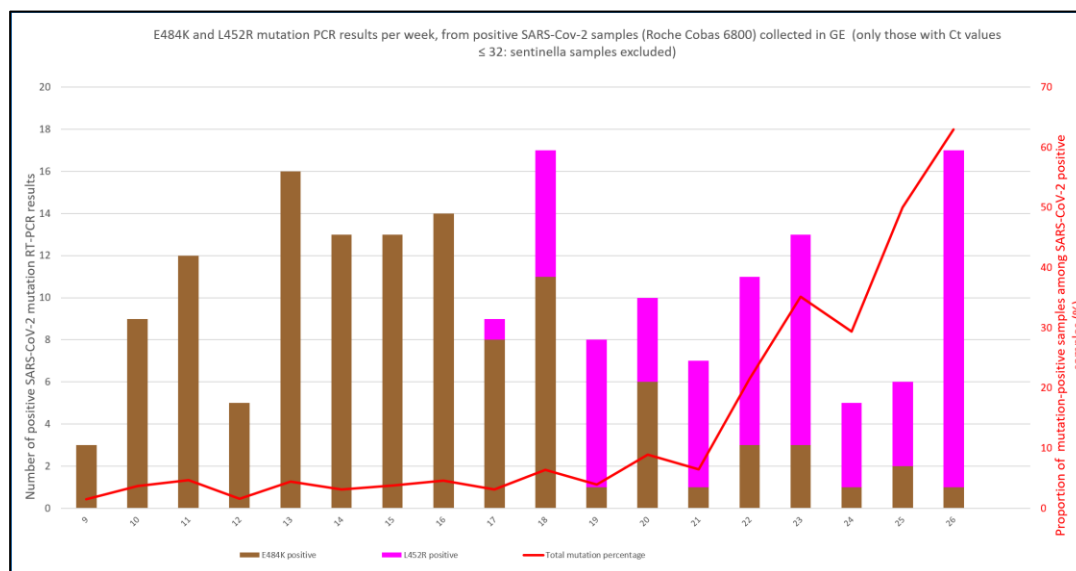
The number of tests performed at the laboratory of virology of Geneva University Hospitals represents around 1/4 of the total number of tests performed in the canton of Geneva during week 26. 1/3 to 1/4 of the positive specimens collected in the Geneva area are processed at HUG for primary diagnosis. Specimens analyzed in our laboratory come from the community (the majority: symptomatic patients and asymptomatic contacts), from hospital workers (systematic screening in case of any symptoms, cluster investigations and asymptomatic HCWs as part of hospital surveillance system), from asymptomatic travelers needing a screening test, and from hospitalized patients. 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; all positive antigen-based tests are confirmed by PCR, allowing screening for variants.

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 cases diagnosed at HUG and the positivity rate have slightly increased over the last week. However, the mean daily number of positive tests at HUG remained low, at 5.5 over the last 7 days.

### Specific mutations screening by RT-PCR among SARS-CoV-2 positive samples collected in GE and sent to our laboratory for primary diagnosis, according to calendar weeks



Starting date of E484K/Q mutation screening: January, 27, 2021. Starting date of 417N/T mutation screening: March, 3, 2021. This 417N/T screening is done on E484K-positive samples, and presumably allows distinguishing between B.1.351 (beta) and P.1 (gamma, not depicted on this graph). Starting date of L452R mutation screening: May, 4, 2021 (week 17). This graph only displays positive results of specific mutations looked for in samples sent for primary diagnostic with Ct values  $<32$ , and does not include mutation results obtained in SARS-CoV-2-positive samples sent from other laboratories.

#### Note:

The 484K mutation is mainly found, but not exclusively, on the B.1.351 (Beta), the P.1 (Gamma) variants, and various variants of interest.

The 452R mutation is mostly, but not exclusively, carried by the B.1.617.2 (Delta) (and AY.1, which is B.1.617.2 with an additional 417N mutation) and the C.36.3 variants (not a VOC but a VOI).

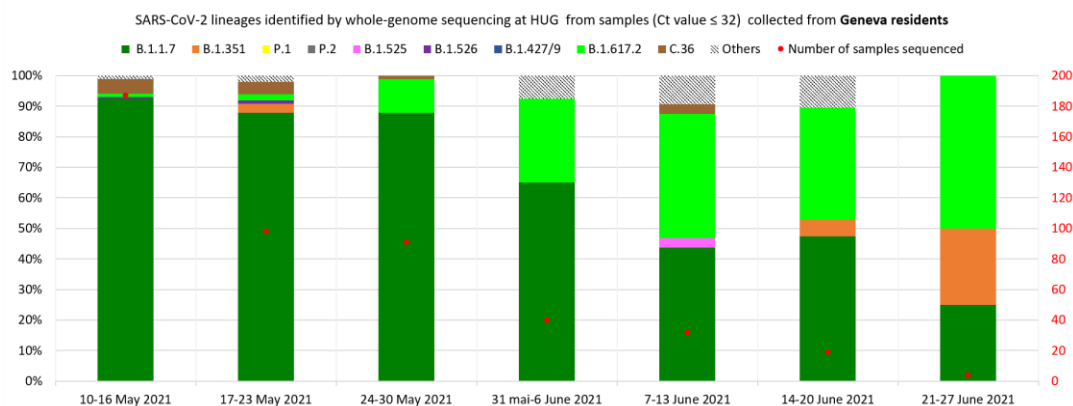
Over the last week, few (27) positive specimens with Ct values below 32 were collected at HUG from persons living in the Geneva area. The total number of new cases in the whole canton was less than 90 over the same period.

The 452R mutation was detected in more than half of the specimens tested last week at the HUG laboratory of virology.

Because of the circulation in Geneva of a sub-lineage of the Delta variant carrying the 417N mutation (AY.1 lineage), since the beginning of week 27 (starting July 5, 2021) we started automatically screening all positive specimens for the 417N mutation.

Moreover, since the beginning of this week (July 5, 2021), all positive tests processed in the canton of Geneva will be sent to the HUG laboratory of virology for specific mutation screening and sequencing at the request of the cantonal physician team. This will allow a more precise representation of the circulating SARS-CoV-2 variants in the Geneva area.

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



CAVEAT: Only 4 sequences (collected from Geneva residents, with Ct values <32 and tested at HUG for primary diagnosis) were available for the surveilled period (21 to 27 of June). Until mid-May, up to 200 sequences were analyzed each week. The proportion of the different variants should therefore be carefully interpreted in this context of low numbers.

Nevertheless, the Delta variant seems to progressively increase in proportion, representing 50% of available sequences (2/4) collected between June 21 and June 27. Additional specimens originating from other laboratories and sent to HUG at the request of the cantonal physician team were confirmed to be Delta. Not depicted on this graph, both Delta and AY.1 (Delta + 417N) are circulating in the Geneva area.

Of note, most identified cases of the Delta variant are new importations from countries where new surges have been identified, while local transmissions without known transmission chains have also been identified.

## Conclusions

- The circulation of SARS-CoV-2 in the Geneva area remains low, with however a trend towards a slight increase.
- The 452R mutation (carried, among other variants, by Delta, Delta + 417N (AY.1) and C.36.3) was detected in more than half of the specimens tested last week at the HUG laboratory of virology.
- **Both specific mutation screening and sequencing data reflect the progressive replacement of the B.1.1.7 (Alpha) variant by the B.1.617.2 (Delta) variant and its sublineage AY.1 (Delta + 417N) in the Geneva area.**
- Both B.1.617.2 (Delta) and its sublineage AY.1 are circulating in the Geneva area.
- This increase of detection of the Delta variant in the Geneva area is not linked to a recrudescence of the number of hospitalized patients.
- The Delta variant has been identified both in travelers and in the community. According to the cantonal physician team, some cases are not linked to previously identified transmission chains, and apparently originate from unidentified transmission chains.
- Starting July 5, 2021, all positive SARS-CoV-2 PCR samples processed in the canton of Geneva will be sent to the HUG laboratory of virology for specific mutation screening and sequencing at the request of the cantonal physician team. This will allow a more precise representation of the circulating SARS-CoV2 variants in the Geneva area.



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