

Genomic surveillance of SARS-CoV-2 in Belgium

Report of the National Reference Laboratory (UZ Leuven & KU Leuven)

Situation update – 15 of June 2021
(report 2021_32)

Executive summary

26.713 Belgian sequences of SARS-CoV-2 are now publicly available on GISAID.

For baseline surveillance, samples collected during the last two weeks (769 sequences collected between 31 May and 13 June),

- B.1.1.7 (*Alpha*) represented 80,4% (compared to 81,8% in the last report) ↘
- P.1 (*Gamma*) represented 9,9% (compared to 9% in the last report) ↗
- B.1.617.2 (*Delta*) represented 6,1% (compared to 3,9% in the last report) ↗
- B.1.351 (*Beta*) represented 1,4% (compared to 1,4% in the last report) =

Other points of attention:

- The NRC performed 140 VOC PCRs on unselected positive samples analyzed during the last 9 days. B.1.1.7, P.1 and B.1.617.1/.2 represented respectively 82,9%, 3,6% and 12,1% (↗) of the results.

- Belgium will probably experience a rapid acceleration of B.1.617.2 infections in the coming weeks, possibly resulting in a rise in the number of infections and hospitalisations during the summer. The public health consequences of this phenomenon could be mitigated through

(1) enlarging testing & tracing criteria in order to adapt to the intrinsic higher transmissibility of B.1.617.2 and contain its spread while the number of people infected is still limited

(2) a broader utilisation of currently unused testing capacity (systematic testing of returning travellers, systematic testing of the currently named “low risk contacts”, mass screening in targeted areas experiencing a rapid surge of infection)

(3) maintaining fast-paced vaccination campaign and clearly informing the public that one single dose does not offer adequate protection against the currently circulating variants, and especially the B.1.617.2 variant

Authors (National Reference Laboratory – UZ Leuven and KU Leuven):

Lize Cuypers, Guy Baele, Piet Maes, Simon Dellicour, Els Keyaerts, Sunita Janssenswillen, Marc Van Ranst, Emmanuel André.

With the collaboration of the laboratories of UCL, ULB, UMons, UNamur, ULiège, UGent, UZA/UAntwerpen, Jessa ZH, AZ Delta, AZ Klina, IPG, AZ St Lucas Gent, OLVZ Aalst, Briant network, ZNA, AZ St Jan Brugge, and UZ Leuven/KU Leuven.

Previous reports can be downloaded using the following link:

<https://www.uzleuven.be/nl/laboratoriumgeneeskunde/genomic-surveillance-sars-cov-2-belgium>

Table of content

1. Monitoring of VOCs in Belgium
2. Monitoring of epidemiologic trends in the different continents

1. Monitoring of VOCs in Belgium

International evolution

The delta variant (B.1.617.2) has continued to spread globally, including in the UK, with a proportion of cases resulting in more severe disease and hospitalisation.

The latest report “Effectiveness of COVID-19 vaccines against hospital admission with the Delta (B.1.617.2) variant” published by the United Kingdom suggests that:

- the Pfizer-BioNTech vaccine is 96% effective against hospitalisation after 2 doses
- the Oxford-AstraZeneca vaccine is 92% effective against hospitalisation after 2 doses

These are comparable with vaccine effectiveness against hospitalisation from the Alpha variant. The analysis included 14,019 cases of the Delta variant – 166 of whom were hospitalised – between 12 April and 4 June, looking at emergency hospital admissions in England.

Further work remains underway to establish the level of protection of vaccines against mortality from the Delta variant. However, as with other variants, this is expected to be high.

Situation in Belgium

While it was first identified on 6 April 2021 in Belgium, the B.1.617.2 Variant of Concern (Delta) has now outpaced P.1 (Gamma) among 83 representative samples collected between 7/06/2021 and 13/06/2021.

The Belgian NRC has been informed of at least one severe B.1.617.2-related outbreak in an elderly care facility, which resulted in 12 fatalities (of 102 residents infected) despite a >95% vaccination coverage among residents. NRC is involved, together with public health authorities and the medical services, in a detailed investigation of this outbreak, and more information will be communicated in the next reports. This investigation includes a wide range of genomic analysis, environmental sampling and the immunological profile of the infected patients.

During the week of 7/6/2021 - 13/6/2021 (83 genomes available to date)

- B.1.617.2 represented 13,3% of all positive samples analysed
- P.1 represented 10,8% of all positive samples analyzed
- B.1.1.7 frequency dropped to 73,5% of all samples analyzed.

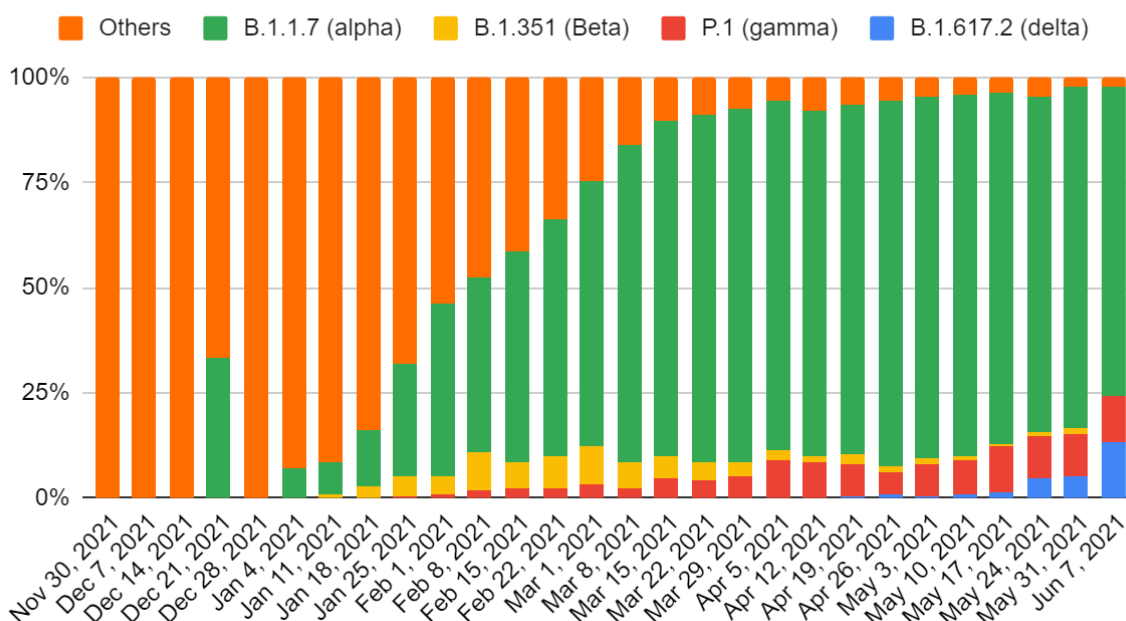


Figure 1: Weekly evolution of the frequency of variants of concern reported by the baseline surveillance network using a whole genome sequencing (WGS) approach.

During the latest week from 7/6/2021 until 15/6/2021 (140 VOC PCR available to date)

- B.1.617.2 and B.1.617.1 represented together 12,1% of all positive samples analysed
- P.1 represented 3,6% of all positive samples analyzed
- B.1.1.7 frequency dropped to 82,9% of all samples analyzed.

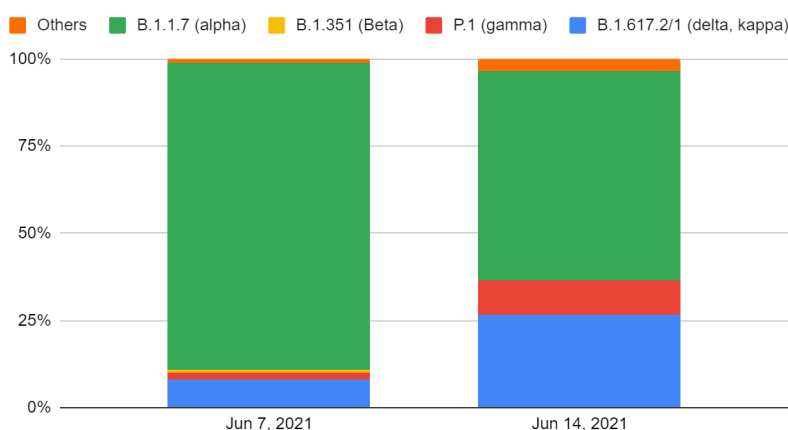


Figure 2: Weekly evolution of the frequency of variants of concern reported by the NRC early surveillance network using a combination of genetic markers (PCR technology). Of note, for week 24 (starting at 14/6), data of only two days is summarized compared to the previous complete week of 7 days (week 23 from 7 until 13/6).

Lineage	Number of Belgian cases reported on GISAID	First reported
B.1.1.7 (Alpha)	16.134	30/11/2020
B.1.351 (Beta)	939	20/12/2020
P.1 (Gamma) and P.1.1	1.342	29/1/2021
B.1.617.2 (Delta)	221	6/4/2021
B.1.1.7 +S:E484K B.1.1.7 +S:S477R	25 30	31/3/2021 15/3/2021
B.1.214.2	692	3/1/2021
B.1.525 (Eta)	65	30/1/2021
B.1.620	18	31/3/2021
B.1.1.318	39	3/3/2021
A.27	19	11/1/2021
B.1.617.1 (Kappa)	15	25/3/2021

Table 1: List of VOCs (red) and VOIs (orange) identified in Belgium to date and cumulative number of sequences available on GISAID (total of 25.921 sequences).

2. Monitoring of epidemiologic trends in different continents

The upcoming two months will be associated with intense travels in Europe and beyond, resulting in a significantly increased risk of massive importations of VOCs and VOIs by returning travellers, as it was the case at several occasions in the past (see report 30 for a more detailed discussion).

Hereunder, we highlight some potentially relevant epidemiological situations in different countries, with the aim to guide the testing & quarantine recommendations applied for travellers returning to Belgium.

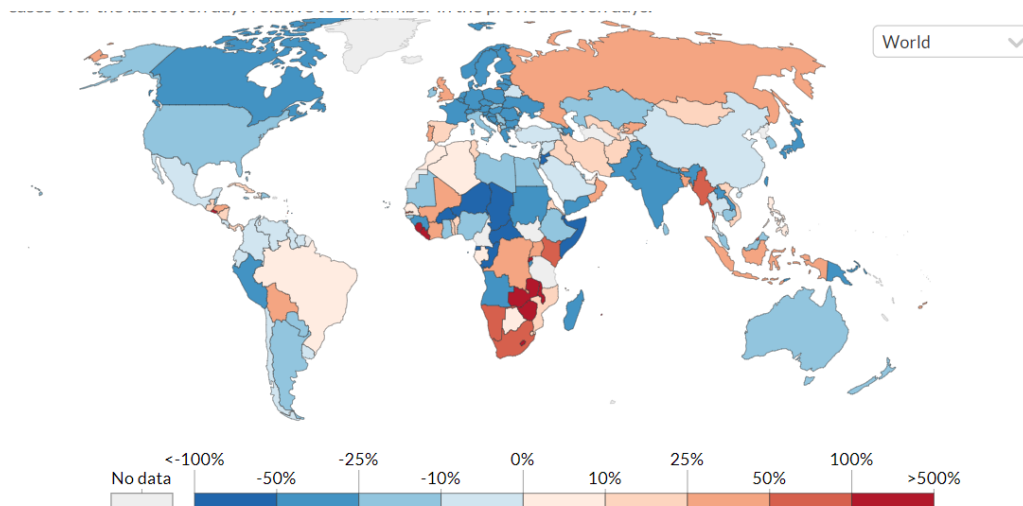


Figure 3: Week by week change in confirmed COVID-19 cases (source: Our World in Data).

In the European region, 4 countries (UK, Portugal, Russia and Spain) currently show a negative epidemiological trend associated with a rapid rise of the variant B.1.617.2. Although B.1.617.2 is associated with a certain level of immune escape, the majority of the infections in these countries are probably occurring among unvaccinated and not fully vaccinated people. This phenomenon has resulted in a (currently) moderate increase of new hospitalizations in the United Kingdom and Portugal (data not available for Russia).

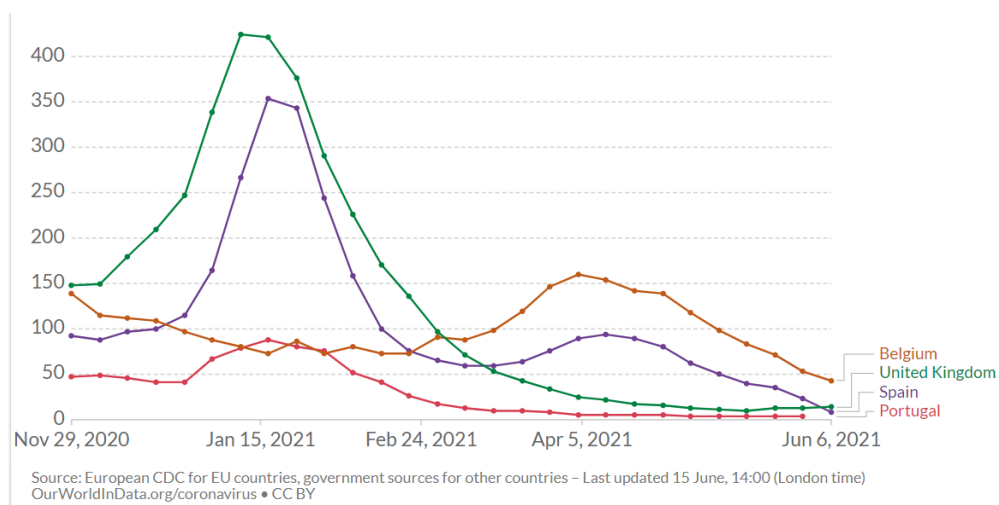


Figure 4: Weekly new hospital admissions for COVID-19 in the UK, Portugal, Spain and Belgium.

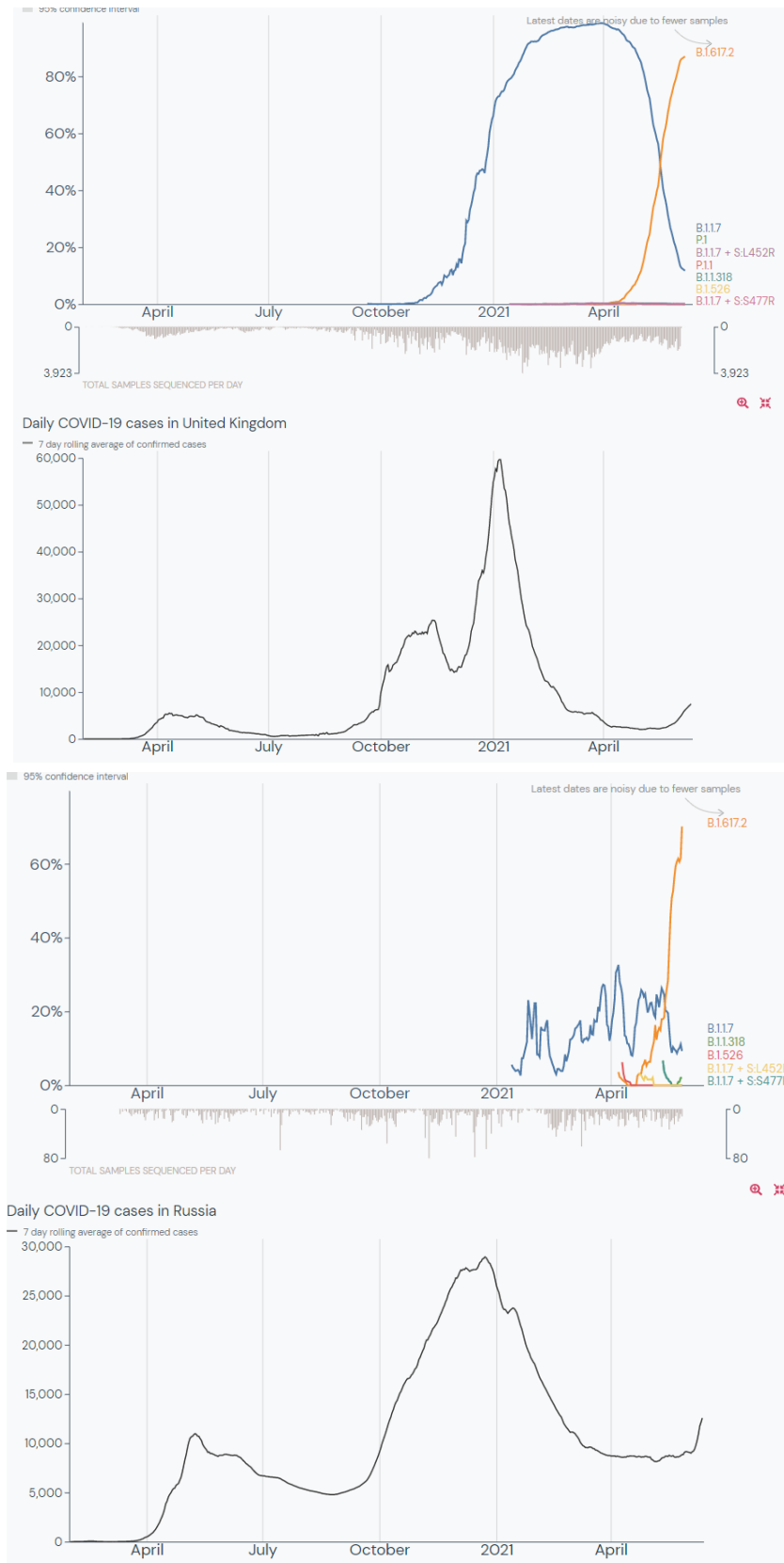


Figure 5 Evolution of the share of viral populations and epidemiological situation in the United Kingdom and Russia (source: outbreak.info & GISAID).

In the African region, a significant number of countries currently show a negative epidemiological trend and numerous countries now report higher rates of infection than what was reported during the last waves. It is difficult to understand the potential role played by different variants as the genomic surveillance is insufficiently representative in most countries.

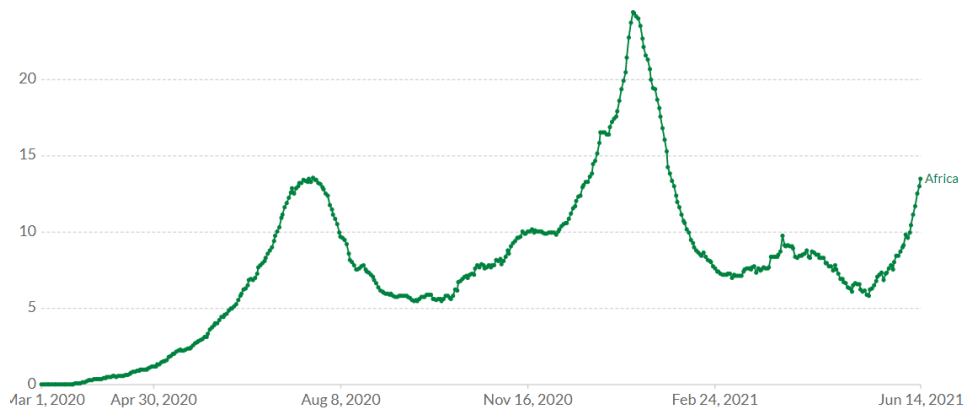


Figure 6: Daily new confirmed cases per million people in the African continent