Summary of COVID-19 virus variants in Ireland

Report prepared by HPSC and NVRL on 25/05/2021

Background

All medical practitioners, including clinical directors of diagnostic laboratories, are required to notify the Medical Officer of Health (MOH)/Director of Public Health (DPH) of any confirmed, probable or possible cases of COVID-19 that they identify. Laboratory, clinical and epidemiological data, on notified COVID-19 cases, are recorded on Health Protection Surveillance Centre's (HPSC) Computerised Infectious Disease Reporting System (CIDR).

This report includes whole genome sequencing (WGS) carried out by the National Virus Reference Laboratory (NVRL) and partners. Current whole genome sequencing capacity is approximately 1,000 specimens per week.

This report summarises whole genome sequencing and epidemiological data for COVID-19 cases that have been sequenced in Ireland since week 51 2020 (specimen dates between 13th December 2020 and 13th May 2021) and provided to HPSC as of 24/05/2021. Epidemiological data on these cases were extracted from CIDR on 14/05/2021 and supplemented by information from the COVID care tracker (CCT) database and local Departments of Public Health. CIDR is a dynamic system and case details may be updated at any time. Therefore, the data described here may differ from previously reported data and data reported for the same time period in the future.

The interim case definition for variants of concern (VOC) for public health response and an overview of the procedures for laboratory detection of mutations or variants of concern at NVRL are available here. The World Health Organization working definitions for 'SARS-CoV-2 variants of concern' and 'SARS-CoV-2 variants of interest' are available here.

Overview of virus variants identified in Ireland to date

The first VOC case was detected in Ireland in week 51 2020. Seven percent of all confirmed COVID-19 cases since week 51 have been sequenced. The proportion of COVID-19 cases with sequencing results has increased over time, with 32% of confirmed cases sequenced in week 18 2021.

The World Health Organization newly classified the B.1.617 (India[1]) variant as a variant of concern on May 10th 2021. On Monday May 17th 2021, all three sub-lineages of B.1.617 (India) have been added to the VOC category in Ireland (i.e B.1.617.1, B.1.617.2, B.1.617.3). Cases of five variants of concern (VOC) have been identified in Ireland to

[1] The geographical region in brackets, after the variant name, indicates the location where the variant was first identified

date B.1.1.7 (UK), B.1.351 (South Africa), P.1 (Brazil), B.1.617.2 (India) and B.1.617.1 (India). Six variants of interest have also been identified; P.2 (Brazil), B.1.525 (Nigeria), B.1.526 (New York), B.1.1.318 (UK), B.1.429 (California) and A.27 (first identified in Mayotte – French overseas Department).

The first VOC case detected in Ireland, a B.1.1.7 (UK) case, had a specimen date in week 51 2020 (week starting December 13th). Transmission of this variant is now widespread in Ireland. Ninety four percent of sequenced COVID-19 cases with specimen dates between week 8 and 16 2021 were infected with the B.1.17 variant. This has since decreased slightly in recent weeks, with 89% of sequenced cases with specimen dates between week 16 and 19 2021 infected with the B.1.17 variant.

The first case of the B.1.351 (South Africa) VOC identified in Ireland had a specimen date in week 52 2020 (week starting December 20th). A total of 72 COVID-19 cases have been confirmed to have been infected with this variant in Ireland to date. The first case of the P.1 (Brazil) VOC was sampled in week 5 2021 (week starting January 31st). To date this variant has been confirmed in 28 cases of COVID-19.

The first cases of the B.1.617.1 (India) and B.1.617.2 (India) VOCs had specimen dates in week 13 2021 (week starting March 23th 2021) and week 14 2021 (week starting April 4th 2021), respectively. To date in Ireland 89 cases of COVID-19 infected with B.1.617.2 (India) (specimen dates: April 7th to May 13th), and 39 cases infected with B.1.617.1 (India) (specimen dates: March 26th to May 7th), have been identified.

Table. 1 summarises the number of cases that underwent whole genome sequencing (WGS) in Ireland since week 51 2020. Figures 1a and 1b illustrate sequencing results since week 51 2020.

Table 1. Sequencing results for COVID-19 cases sampled from week 51 (December 13th 2020) to week 19* (May 15th 2021)

Virus variant	Number of cases	% sequenced cases
Variants of concern		
B.1.617.2 (India)	89	0.8
B.1.351 (South Africa)	72	0.6
B.1.617.1 (India)	39	0.3
P.1 (Brazil)	28	0.2
B.1.1.7 (UK)**	10478	88.9
Variants of interest		
B.1.1.318 (UK)	181	1.5
B.1.525 (Nigeria)	54	0.5
P.2 (Brazil)	15	0.1
B.1.526 (New York)	8	0.1
B.1.429 (California)	6	0.1
A.27 (France)	2	0.0
Other - not variants of concern or interest	817	6.9
Total	**11,789**	**100**

*Incomplete data for week 19, **Two cases infected with the B.1.1.7 variant were found to have the additional E484K mutation.

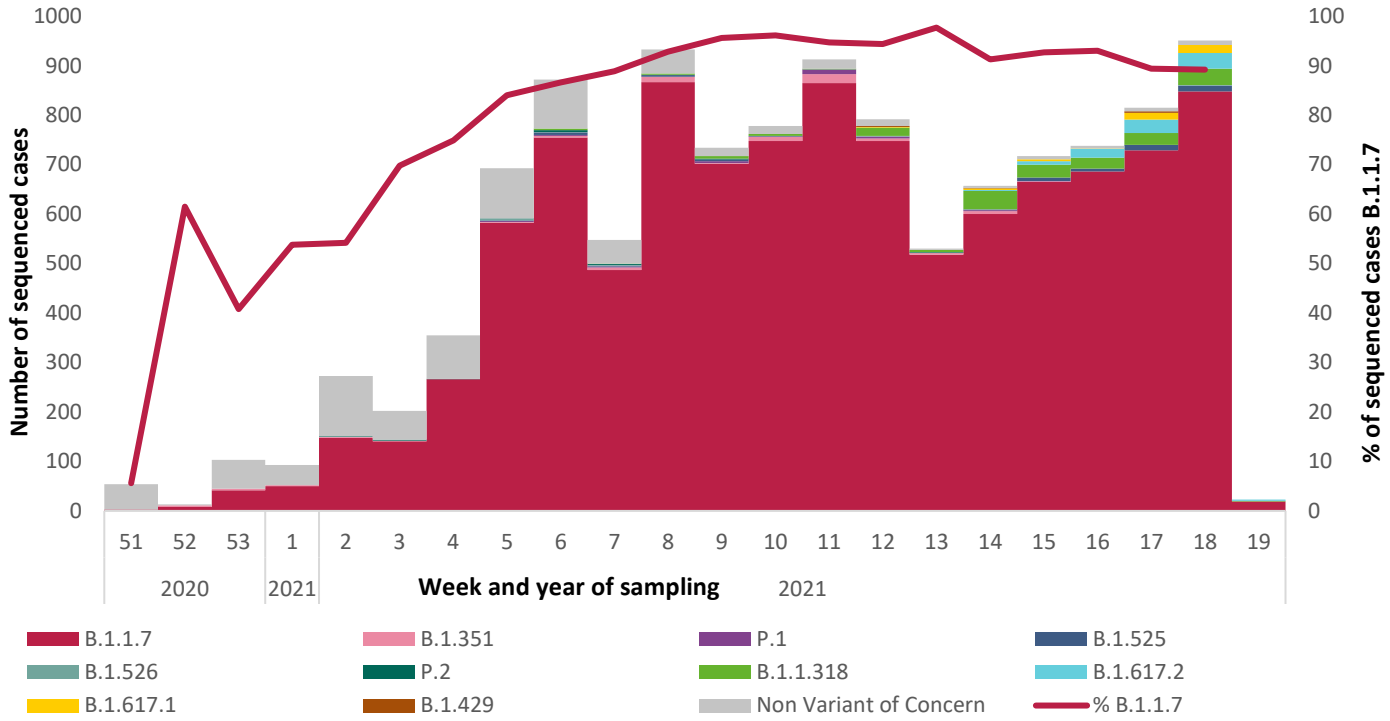

Figure 1a. Whole genome sequencing results and percentage of sequenced specimens* that were found to be the B.1.1.7 (UK) variant of concern, specimen collection dates from week 51 (December 13th 2020) to week 19 (May 15th 2021)**

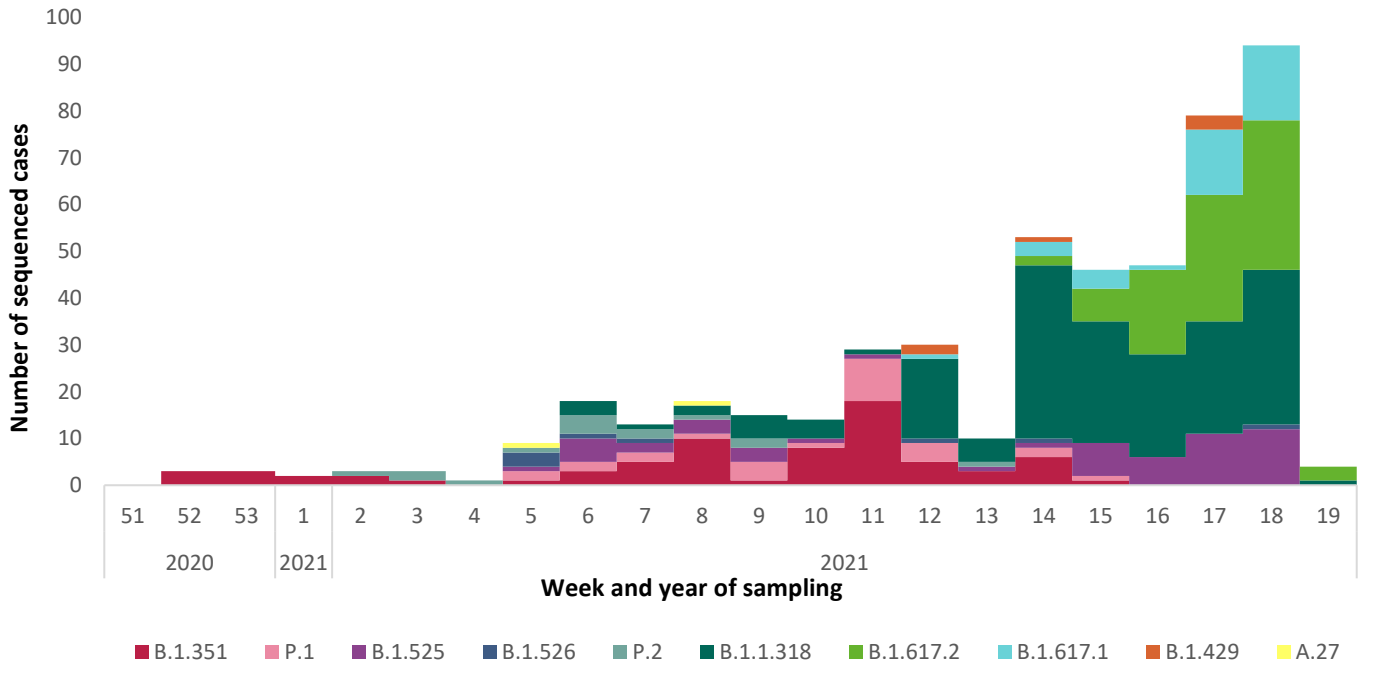

Figure 1b. Whole genome sequencing results, excluding B.1.1.7 (UK) and non-variants of concern, specimen collection dates from week 51 (December 13th 2020) to week 19 (May 15th 2021)**

*The proportion of cases attributed to lineage B.1.1.7 is based on S gene target failure (SGTF) data from the Thermo Fisher TaqPath assay. To date, all those SGTF samples that have undergone WGS have been identified as lineage B.1.1.7.

**WGS result for specimens with sampling dates in recent weeks may not yet be available.

Note: Variants identified in <5 cases were not included in figure 1a

Variants of concern

B.1.351 (South Africa) VOC: A total of 72 COVID-19 cases have been confirmed to have been infected with the B.1.351 (South Africa) VOC in Ireland to date. These are summarised in table 1, figure 2 and table 2.

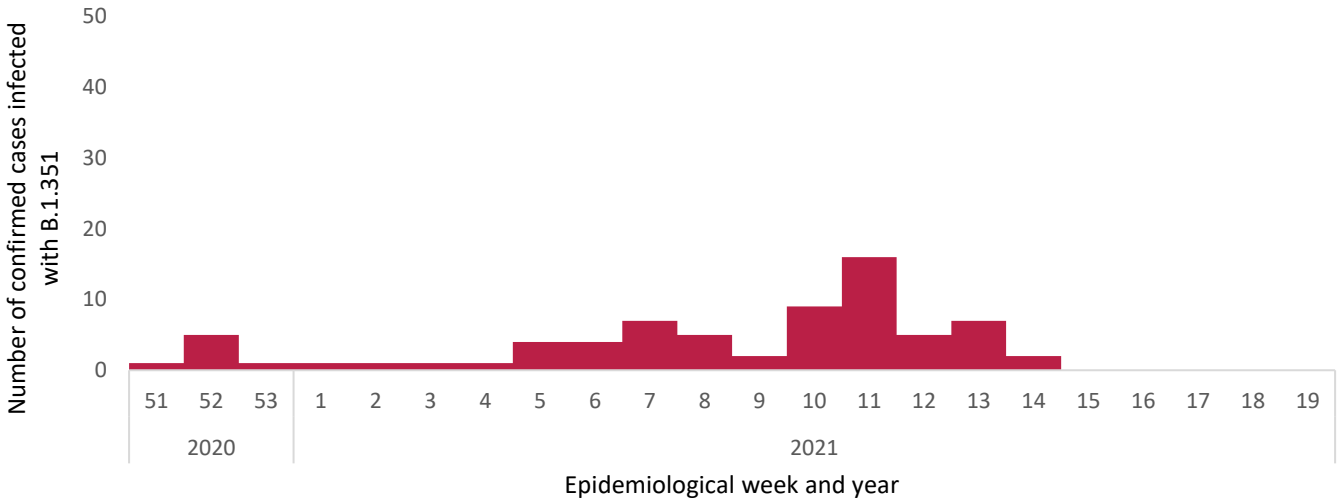

Figure 2. Number of cases of COVID-19 identified as infected with the B.1.351 (South Africa) VOC by epidemiological date*

*Epidemiological date is derived from the earliest of; onset date, date of diagnosis, laboratory specimen collection date, laboratory received date, laboratory reported date or event creation/notification date.

P.1 (Brazil) VOC: To date the P.1 (Brazil) has been confirmed in 28 cases of COVID-19. These are summarised in table 1, figure 3 and table 2.

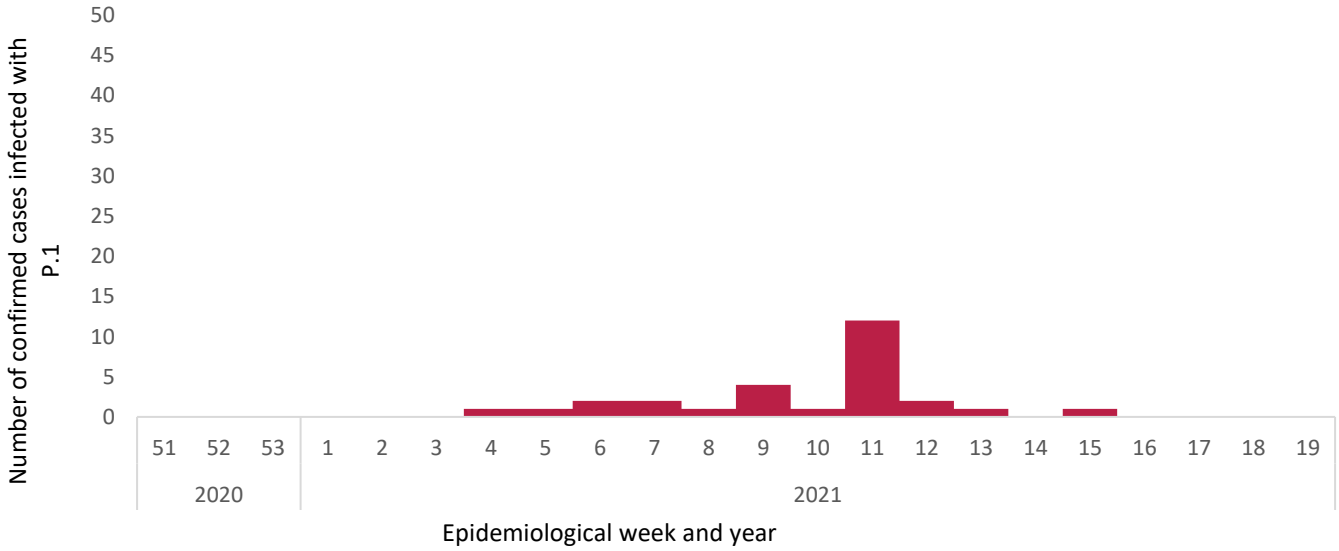

Figure 3. Number of cases of COVID-19 identified as infected with the P.1 (Brazil) VOC by epidemiological date*

*Epidemiological date is derived from the earliest of; onset date, date of diagnosis, laboratory specimen collection date, laboratory received date, laboratory reported date or event creation/notification date.

B.1.617.2 and B.1.617.1 (India) VOCs: The B.1.617.2 (India) VOC has been confirmed in 89 cases of COVID-19 and the B.1.617.1 (India) VOC has been confirmed in 39 cases of COVID-19 to date. These are summarised in table 1, figure 4 and table 2).

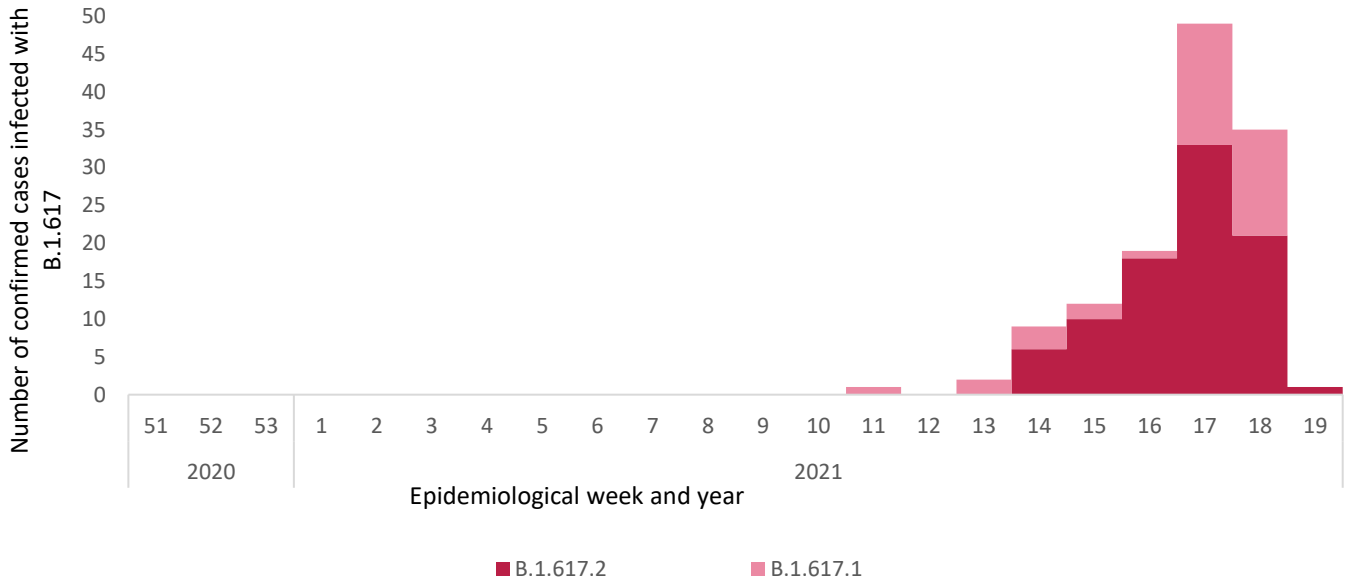

Figure 4. Number of cases of COVID-19 identified as infected with B.1.617.1 (India) and B.1617.2 (India) VOC by epidemiological date*

*Epidemiological date is derived from the earliest of; onset date, date of diagnosis, laboratory specimen collection date, laboratory received date, laboratory reported date or event creation/notification date.

Table 2. Summary of sequenced cases infected with the variants of concern B.1.351 (South Africa), P.1 (Brazil), B.1.617.2 (India) and B.1.617.1 (India) VOCs, specimen dates from week 51 (December 13th 2020) to week 19* (May 15th 2021)

	B.1.351 (South Africa)		P.1 (Brazil)		B.1.617.2 (India)		B.1.617.1 (India)	
Characteristics	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**
Age group								
≤18 yrs	15	20.8	2	7.1	10	11.2	4	10.3
19-34 yrs	16	22.2	13	46.4	53	59.6	26	66.7
35-44 yrs	20	27.8	7	25.0	16	18.0	4	10.3
45-64 yrs	17	23.6	6	21.4	10	11.2	4	10.3
65+ yrs	4	5.6	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	1	2.6
Sex								
Male	33	45.8	15	53.6	55	61.8	19	48.7
Female	39	54.2	13	46.4	34	38.2	19	48.7
Unknown	0	0	0	0	0	0	1	2.6
Total	**72**		**28**		**89**		**39**	

*incomplete data for week 19

Variants of interest

The variants of interest (VOI) identified in Ireland to date are summarised in table 3. Six VOIs have been identified in Ireland to date; P.2 (Brazil), B.1.525 (Nigeria), B.1.526 (New York), B.1.1.318 (UK) and B.1.429 (California) and A.27 (Mayotte).

Table 3. Summary of sequenced cases infected with variants of interest, specimen dates from week 51 (December 13th 2020) to week 19 (May 15th 2021)

	P.2 (Brazil)		B.1.525 (Nigeria)		B.1.526 (New York)		B.1.1.318 (UK)		B.1.429 (California)	
Characteristics	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**
Age group										
≤18 yrs	1	6.7	16	29.6	7	8.8	64	35.4	2	33.3
19-34 yrs	7	46.7	16	29.6	0	0	35	19.3	2	33.3
35-44 yrs	5	33.3	15	27.8	0	0	34	18.8	0	0
45-64 yrs	1	6.7	5	9.3	1	1.3	31	17.1	2	33.3
65+ yrs	1	6.7	2	3.7	0	0	17	9.4	0	0
Sex										
Male	7	46.7	21	38.9	5	6.3	76	42.0	3	50.0
Female	8	53.3	33	61.1	3	3.8	105	58.0	3	50.0
Unknown	0	0	0	0	0	0	0	0	0	0
Total	**15**		**54**		**8**		**181**		**6**	

Note: 2 cases of A.27 have also been identified

Acknowledgements

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Technical notes and links to further virus variant resources

Table A. Description of possible and confirmed attributes associated with variants of concern and interest

PANGO lineage	Description
B.1.1.7	Increased transmission, no change in antigenicity, potential increased severity
P.1	Increased transmission, reduced neutralisation by antibodies generated in response to vaccination or previous infection with another variant, potential increased disease severity
B.1.351	Increased transmission, reduced neutralisation by antibodies generated in response to vaccination or previous infection with another variant, potential increased severity
P.2	Potential increased transmission, potential reduced neutralisation by antibodies generated in response to vaccination or previous infection with another variant
B.1.525	Potential increased transmission, potential reduced neutralisation by antibodies generated in response to vaccination or previous infection with another variant
B.1.526	Potential increased transmission, reduced neutralisation by antibodies generated in response to vaccination or previous infection with another variant
B.1.1.318	Under investigation
B.1.617	Potential increased transmission, potential reduced neutralisation by antibodies generated in response to vaccination or previous infection with another variant – emerging variant, further studies needed
B.1.429	Potential increased transmission, reduced neutralisation by antibodies generated in response to vaccination or previous infection with another variant

Further information

Dates of epidemiological weeks are available at: https://www.hpsc.ie/notifiablediseases/resources/epidemiologicalweeks/

https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/variant-surveillance/variant-info.html

https://www.cdc.gov/coronavirus/2019-ncov/transmission/variant.html

https://www.ecdc.europa.eu/en/publications-data/covid-19-infographic-mutations-current-variants-concern

https://www.gov.uk/government/publications/covid-19-variants-genomically-confirmed-case-numbers/variants-distribution-of-cases-data

https://www.gov.uk/government/news/confirmed-cases-of-covid-19-variants-identified-in-uk