



Summary of COVID-19 virus variants in Ireland

Report prepared by HPSC and NVRL on 08/06/2021

Background

All medical practitioners, including the 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 the 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 27th May 2021). WGS data included in this report are data received from the NVRL as of June 8th 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 the laboratory detection of mutations or variants of concern at the NVRL are available [here](#).

The World Health Organization (WHO) working definitions for 'SARS-CoV-2 variants of concern' (VOCs) and 'SARS-CoV-2 variants of interest' (VOIs) are available [here](#). On May 31st 2021, the following announcement was made by WHO.

Following extensive consultation and deliberations, WHO proposes the following; for existing and newly designated VOCs and VOIs, according to WHO's working definitions, which include an assessment of the risks posed to global public health, WHO will assign labels based upon the Greek alphabet (i.e. Alpha, Beta, Gamma, etc.). If all 24 letters become assigned, other lists of labels will be considered and announced by WHO. Further information on the new labels of already defined VOCs and VOIs can be found at <https://www.who.int/activities/tracking-SARS-CoV-2-variants>.

Consequently, the nomenclature within this report has been updated.

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 significantly in recent months and over one-third of confirmed cases are now being sequenced each week.

Cases of four variants of concern (VOC) have been identified in Ireland to date; B.1.1.7 (Alpha), B.1.351 (Beta), P.1 (Gamma) and B.1.617.2 (Delta). Cases of seven variants of interest have also been identified; B.1.617.1 (Kappa), P.2 (Zeta), B.1.525 (Eta), B.1.526 (Iota), B.1.1.318, B.1.429 (Epsilon) and A.27.

The first VOC case detected in Ireland, a B.1.1.7 (Alpha) case, had a specimen date in week 51 2020. However, two earlier cases of B.1.1.7 (Alpha) have since been identified through retrospective testing. The specimen dates for these two cases were in week 37 2020 (September) and week 43 2020 (October), indicating that B.1.1.7 (Alpha) was circulating prior to December 2020 in Ireland. Ninety four percent (94%) of sequenced COVID-19 cases with specimen dates between weeks 8 and 16 2021 were infected with the B.1.1.7 (Alpha) variant. This has since decreased slightly, with 90% of sequenced cases with specimen dates between weeks 17 and 20 being identified as B.1.1.7 (Alpha). Two cases of the B.1.1.7 (Alpha) variant identified in Ireland have been found to have the additional E484K mutation.

The first case of the B.1.351 (Beta) 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 (Gamma) VOC was sampled in week 5 2021 (week starting January 31st). To date, this variant has been confirmed in 29 cases of COVID-19.

The World Health Organization classified the B.1.617 (India) variant as a variant of concern on May 10th 2021. This variant has three sublineages with different mutations; B.1.617.1 (Kappa), B.1.617.2 (Delta) and B.1.617.3. All three sub-lineages were initially classified as VOCs. However, on monitoring the evolving epidemiological situation, the WHO has decided to re-categorise the B.1.617.1 (Kappa) sub-lineage as a VOI rather than a VOC and global prevalence of the B.1.617.1 (Kappa) sub-lineage appears to be declining.. Significantly increased transmissibility has been observed in association with the B.1.617.2 (Delta) sub-lineage. There have been relatively few reports of the B.1.617.3 sub-lineage to date and this is no longer classified as a VOC or VOI. To date in Ireland, 126 cases of COVID-19 infected with B.1.617.2 (Delta) (specimen dates: April 7th to May 20th) and 107 cases infected with B.1.617.1 (Kappa) (specimen dates: March 26th to May 21st) have been identified.

Table 1 summarises virus variants identified in Ireland since week 51 2020 by most likely transmission source. Figures 1a, 1b and 1c illustrate sequencing results since week 51 2020. Figure 2 shows the number and percentage of confirmed cases of COVID-19 sequenced by week.

Table 1. Sequencing results for COVID-19 cases sampled from week 51 (December 13th 2020) to week 21* (May 29th 2021)

Virus variant	Number of cases	% sequenced cases
Variants of concern		
B.1.617.2 (Delta)	126	1.0
B.1.351 (Beta)	72	0.5
P.1 (Gamma)	29	0.2
B.1.1.7 (Alpha)**	11681	89.0
Variants of interest		
B.1.1.318	191	1.5
B.1.617.1 (Kappa)	107	0.8
B.1.525 (Eta)	59	0.4
P.2 (Zeta)	15	0.1
B.1.526 (Iota)	11	0.1
B.1.429 (Epsilon)	7	0.1
A.27	2	0.0
Other (not variant of concern or variant of interest)	823	6.3
Total	13,123	

*Incomplete data for weeks 19 and 20.

**Two cases infected with the B.1.1.7 variant were found to have the additional E484K mutation.

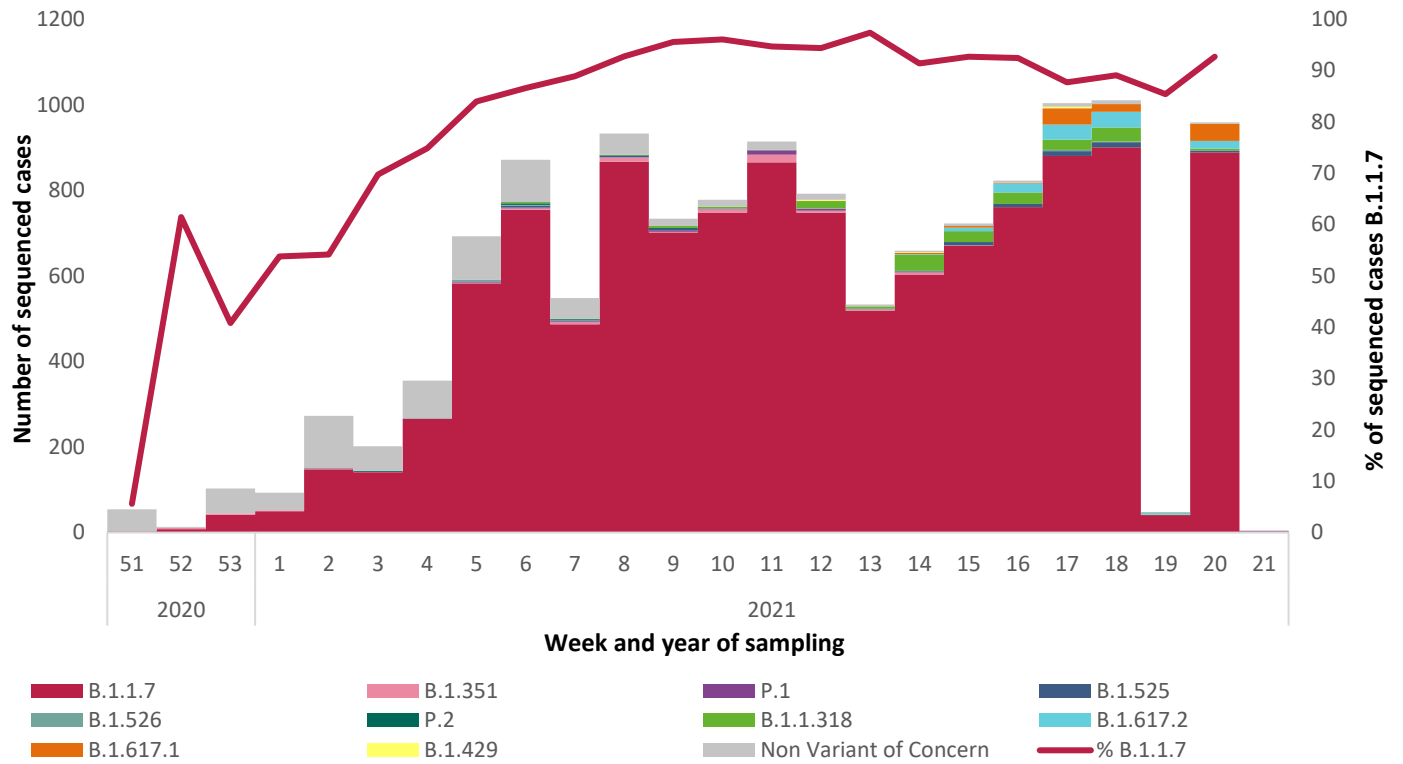


Figure 1a. Whole genome sequencing results and percentage of sequenced specimens* that were found to be the B.1.1.7 (Alpha) variant of concern, specimen collection dates from week 51 (December 13th 2020) to week 21 (May 29th 2021)**

*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. Most specimens taken in week 19 were sent to Germany for sequencing, due to the HSE cyber attack, and results for these are not yet available.

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

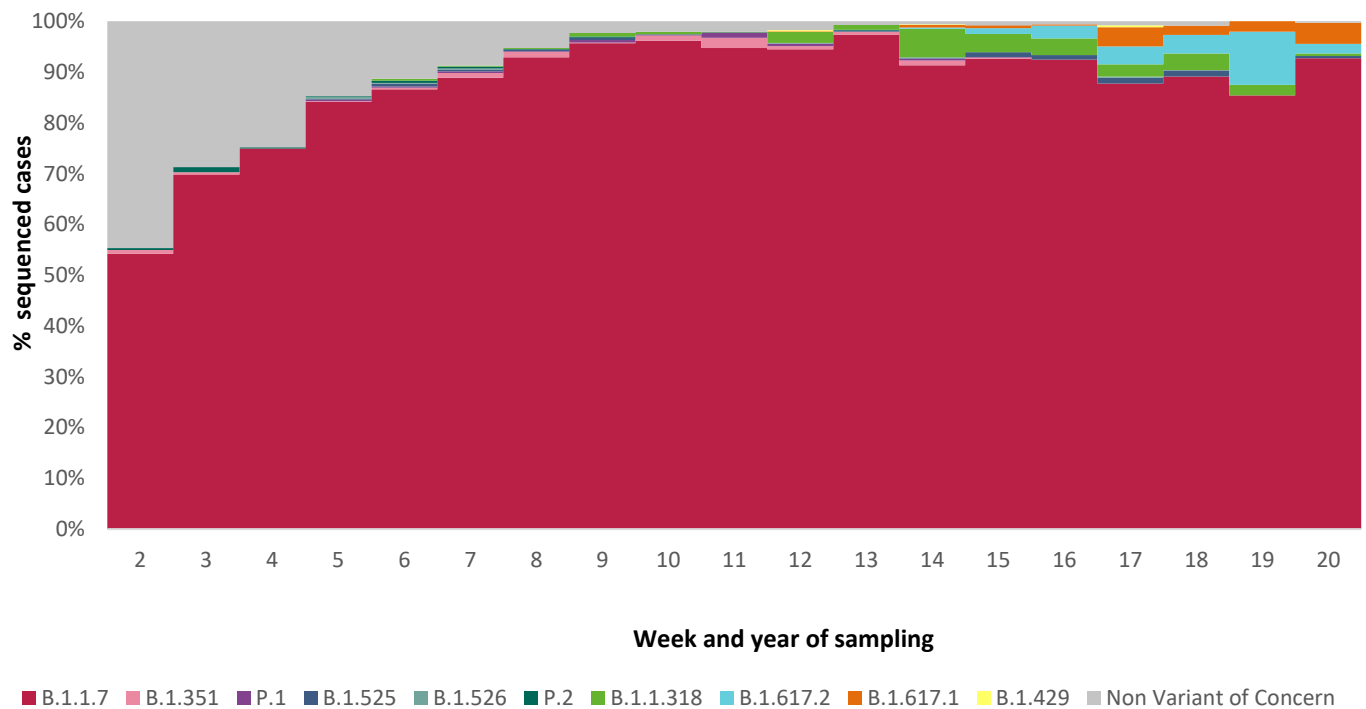


Figure 1b. Percentage of sequenced specimens, by variant of concern or interest, specimen collection dates from week 2 (January 10th 2021) to week 21* (May 29th 2021)

*WGS result for specimens with sampling dates in recent weeks may not yet be available. Most specimens taken in week 19 were sent to Germany for sequencing, due to the HSE cyber attack, and results for these are not yet available.

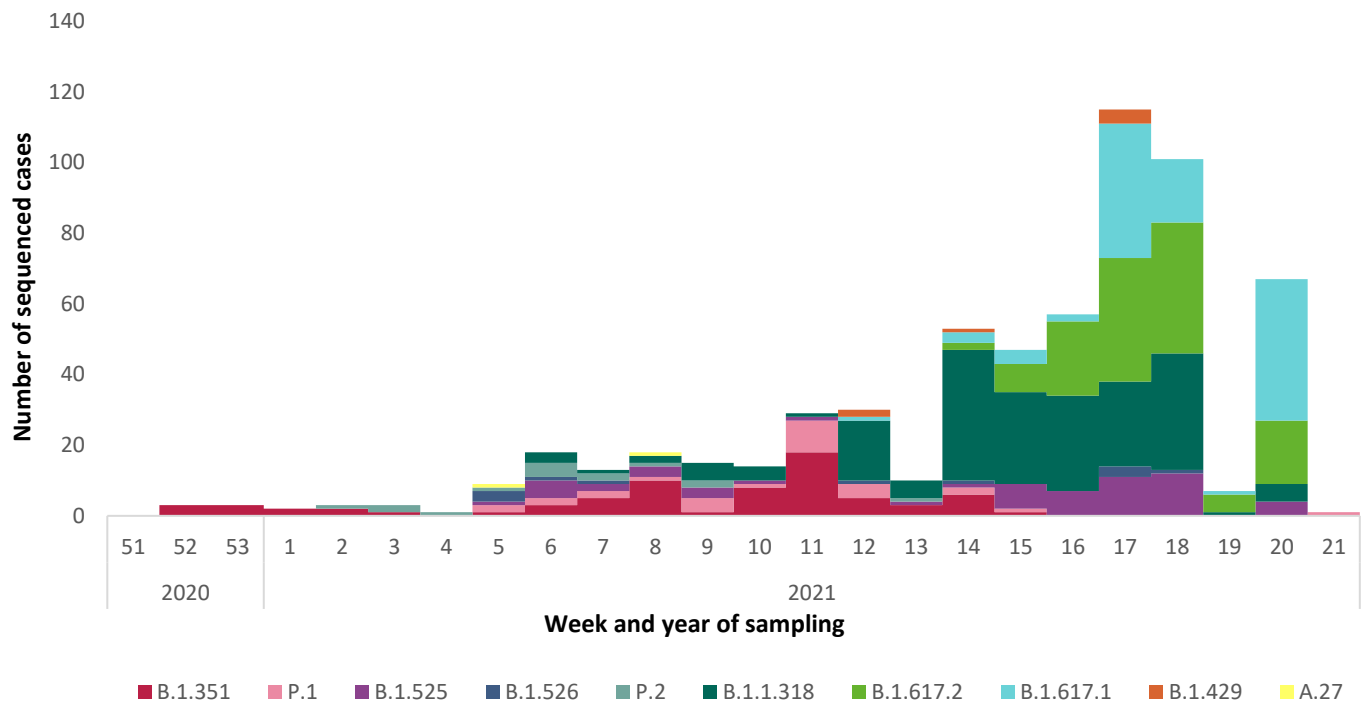


Figure 1c. Whole genome sequencing results, excluding B.1.1.7 (Alpha) and non-variants of concern, specimen collection dates from week 51 (December 13th 2020) to week 21* (May 29th 2021)

*WGS result for specimens with sampling dates in recent weeks may not yet be available. Most specimens taken in week 19 were sent to Germany for sequencing, due to the HSE cyber attack, and results for these are not yet available.

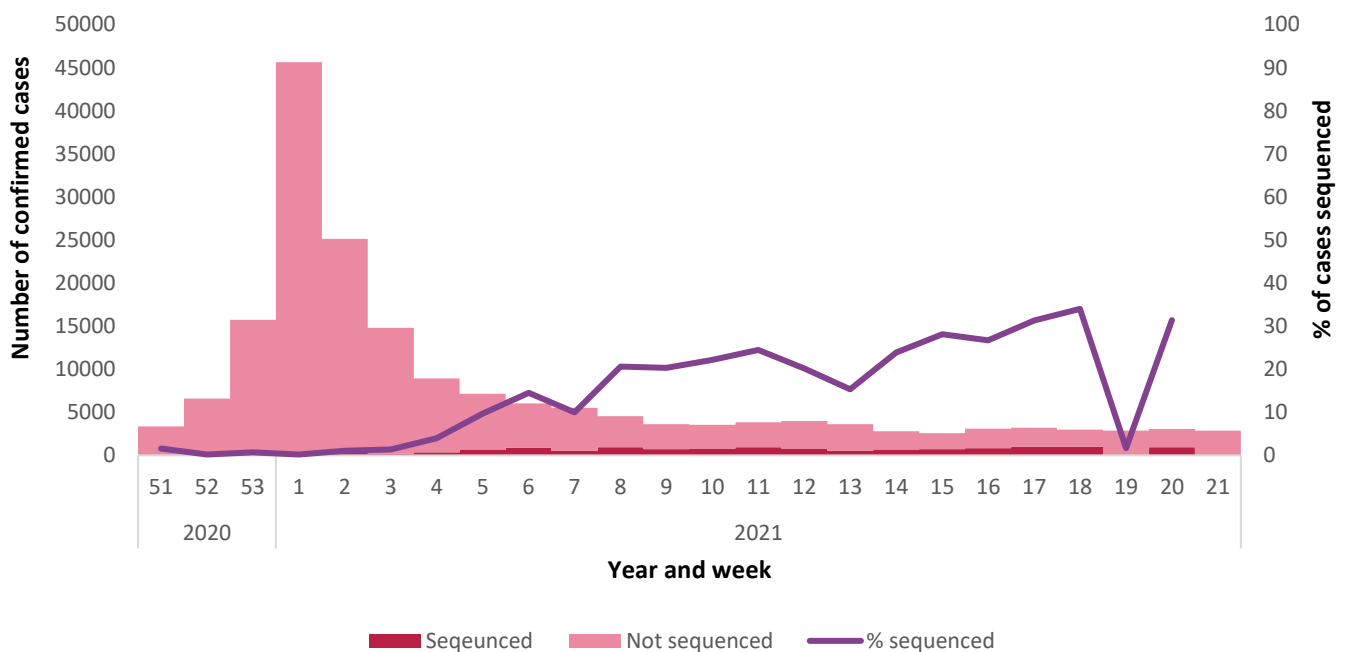


Figure 2. Number of confirmed cases of COVID-19 notified, by number sequenced/not sequenced, and percentage sequenced, week 51 (December 13th 2020) to week 21* (May 29th 2021)

*WGS result for specimens with sampling dates in recent weeks may not yet be available. Most specimens taken in week 19 were sent to Germany for sequencing, due to the HSE cyber attack, and results for these are not yet available.

Variants of concern

B.1.351 (Beta) VOC

A total of 72 COVID-19 cases have been confirmed to have been infected with the B.1.351 (Beta) VOC in Ireland to date. These are summarised in table 1, figure 3 and table 2.

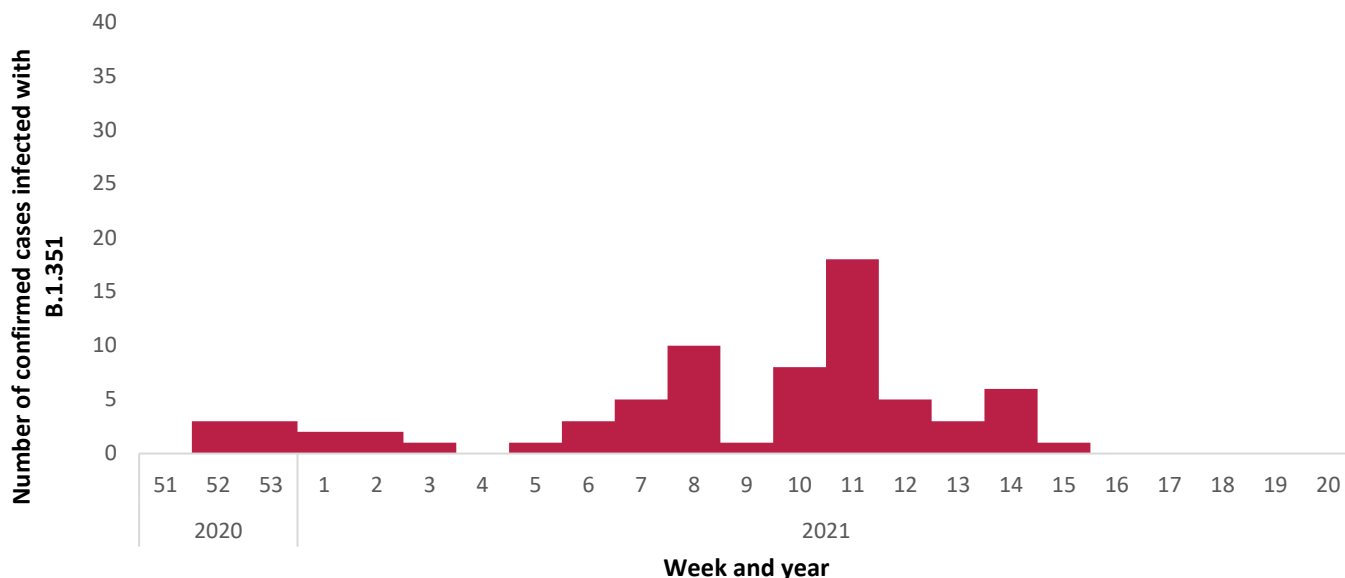


Figure 3. Number of cases of COVID-19 identified as infected with the B.1.351 (Beta) VOC by specimen week* and year

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

P.1 (Gamma) VOC

To date the P.1 (Gamma) VOC has been confirmed in 29 cases of COVID-19 (table 1, figure 4 and table 2).

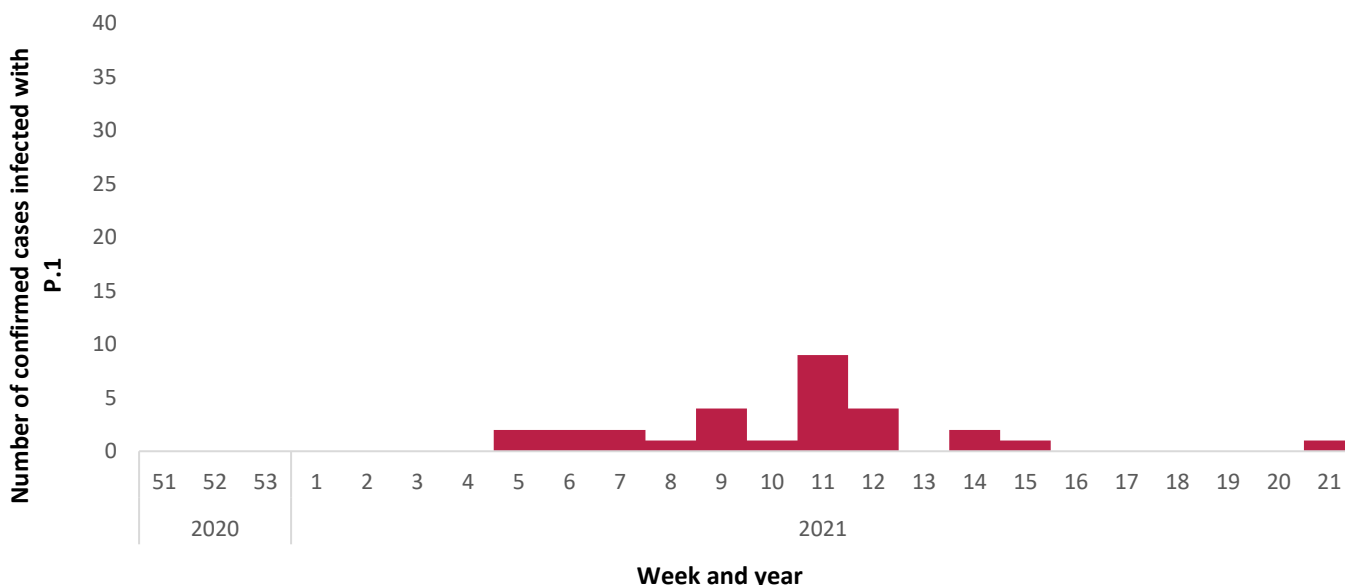


Figure 4. Number of cases of COVID-19 identified as infected with the P.1 (Gamma) VOC by specimen week* and year

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

B.1.617.2 (Delta) VOC

The B.1.617.2 (Delta) VOC has been confirmed in 126 cases of COVID-19 to date in Ireland (table 1, figure 5, figure 6 and table 2).

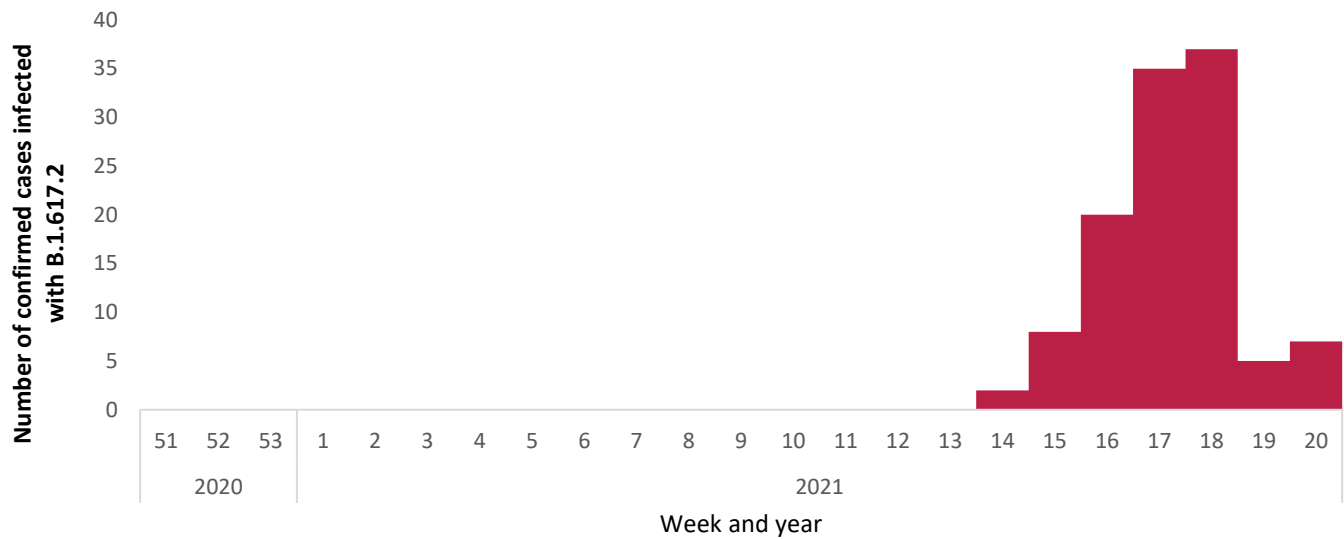


Figure 5. Number of cases of COVID-19 identified as infected with B.1.617.2 (Delta) VOC by specimen week and year*

*WGS result for specimens with sampling dates in recent weeks may not yet be available. Most specimens taken in week 19 were sent to Germany for sequencing, due to the HSE cyber attack, and results for these are not yet available.

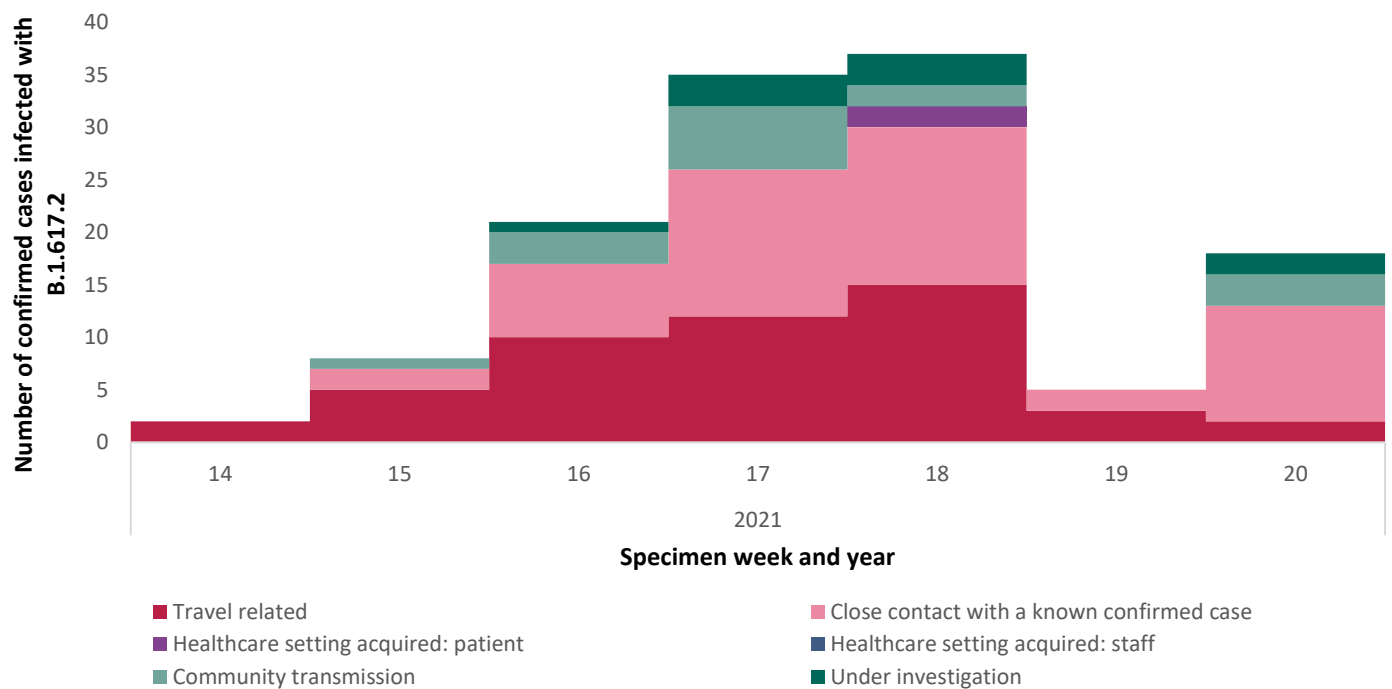


Figure 6. Number of cases of COVID-19 identified as infected with B.1.617.2 (Delta) VOC by most likely mode of transmission and specimen week and year

*WGS result for specimens with sampling dates in recent weeks may not yet be available. Most specimens taken in week 19 were sent to Germany for sequencing, due to the HSE cyber attack, and results for these are not yet available.

Table 2. Summary of sequenced cases infected with the B.1.351 (Beta), P.1 (Gamma) and B.1.617.2 (Delta) variants of concern, specimen dates from week 51 (December 13th 2020) to week 21* (May 29th 2021)

Characteristics	B.1.351 (Beta)		P.1 (Gamma)		B.1.617.2 (Delta)	
	Number	%	Number	%	Number	%
Age group						
≤18 yrs	15	20.8	2	6.9	15	11.9
19-34 yrs	16	22.2	13	44.8	73	57.9
35-44 yrs	20	27.8	8	27.6	25	19.8
45-64 yrs	17	23.6	6	20.7	12	9.5
65+ yrs	4	5.6	0	0	1	0.8
Unknown	0	0	0	0	0	0
Sex						
Male	33	45.8	15	51.7	76	60.3
Female	39	54.2	14	48.3	50	39.7
Unknown	0	0	0	0	0	0
Total	72		29		126	

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

Table 3. Summary of sequenced cases infected with variants of interest, specimen dates from week 51 (December 13th 2020) to week 21* (May 29th 2021)

Characteristics	P.2 (Zeta)		B.1.525 (Eta)		B.1.526 (Iota)		B.1.1.318		B.1.617.1 (Kappa)		B.1.429 (Epsilon)	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Age group												
≤18 yrs	1	6.7	17	28.8	9	81.8	65	34.0	7	6.5	2	28.6
19-34 yrs	7	46.7	17	28.8	0	0	40	20.9	90	84.1	2	28.6
35-44 yrs	5	33.3	17	28.8	0	0	37	19.4	4	3.7	1	14.3
45-64 yrs	1	6.7	6	10.2	2	18.2	32	16.8	5	4.7	2	28.6
65+ yrs	1	6.7	2	3.4	0	0	17	8.9	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	1	0.9	0	0
Sex												
Male	7	46.7	24	40.7	7	63.6	79	41.4	56	52.3	3	42.9
Female	8	53.3	35	59.3	4	36.4	112	58.6	50	46.7	4	57.1
Unknown	0	0	0	0	0	0	0	0	1	0.9	0	0
Total	15		59		11		191		107		7	

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

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

Acknowledgements

Sincere thanks are extended to all those who participate in the collection and reporting of data used in this report. This includes the National Virus Reference Laboratory staff, notifying clinicians, public health doctors, nurses, surveillance scientists, contact tracers, microbiologists, laboratory staff, staff in ICU units and administration staff.

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>