Summary of SARS-CoV-2 virus variants in Ireland

Prepared by HPSC on 20/09/2023
Please note: Data are provisional

Latest information on SARS-CoV-2 variants in Ireland

Since February 2023, XBB (and other recombinant) SARS-CoV-2 variants have dominated circulating SARS-CoV-2 variants worldwide. Since mid-June 2023 a new variant EG.5 which is a descendant of one of these XBB lineages (XBB.1.9.2) and related lineages with the F456L mutation in the spike protein have been increasing in predominance globally and in Ireland. These 'XBB.1.5-like + F456L' lineages accounted for 48.7% of SARS-CoV-2 sequences in Ireland in the latest five weeks of data (weeks 32 to 36 2023). A new WHO and ECDC variant under monitoring, BA.2.86 has not been detected in Ireland to date.

Since mid-June 2023, the EG.5 lineage (XBB.1.9.2 sublineage) has emerged in several parts of the world in increasing numbers and it may continue to spread globally over the coming months. It was added to the WHO list of variants of interest on August 9th 2023, and classified by the UKHSA as a designated variant on July 31st 2023. The ECDC have included EG.5 under the umbrella of 'XBB.1.5-like + F456L' lineages that have similar spike protein profiles including the F456L mutation. This grouping was added to the ECDC list of variants of interest on August 10th 2023. It also includes lineages such as XBB.1.16.6, FE.1 and FL.1.5.1. The EG.5 lineage appears to have a growth advantage compared to other currently circulating variants which is thought to be due to a combination of immune escape associated with the presence of the F456L mutation and waning immunity in the population. There is no evidence to date of increased disease severity or additional public health risks compared to other currently circulating lineages.

To date in Ireland there have been 316 COVID-19 cases confirmed as infected with EG.5 or sublineages. Of these cases, 133 (42.1%) were associated with outbreaks in hospital or healthcare settings (Figure 5). The lineage has increased in prevalence since week 26 2023 and between week 32 to week 36 2023 in Ireland accounting for 32.4% of sequences in this time period (Table 1b).

A new variant with an unusually high number of mutations, BA.2.86, was detected in Israel first on August 13th 2023. It has since been found in several countries including Denmark, UK, USA and South Africa. It was designated as a variant under monitoring by the WHO on August 17th 2023. There have been no cases detected in Ireland to date.

To date, 105,692 SARS-CoV-2 positive specimens have been sequenced in Ireland since late 2020 (Appendix Table 1, Figure 1a and 1b). This report summarises all reported SARS-CoV-2 WGS data in Ireland since the start of the pandemic and also focuses on WGS data from 2023 and more recent weeks. Omicron sequencing results since week 14 2023, and for the most recent five weeks, are shown in Figures 3a and 3b, 4a and 4b, Tables 1a and 1b and Table 2.

Note: There is typically a lag time of 1-3 weeks between a case being notified, selected for sequencing and sequencing being completed. Therefore the % of cases notified in this time period who are ultimately sequenced will be higher than reported here.

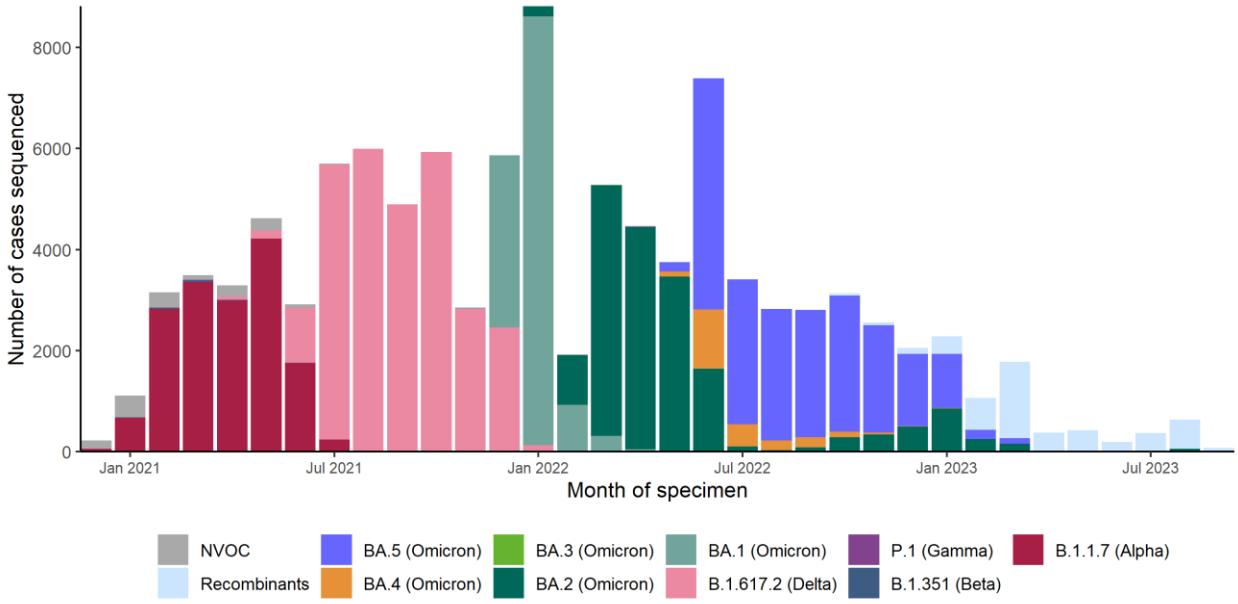

Figure 1a: SARS-CoV-2 whole genome sequencing results, specimen collection dates from December 2020 to September 2023, Ireland.

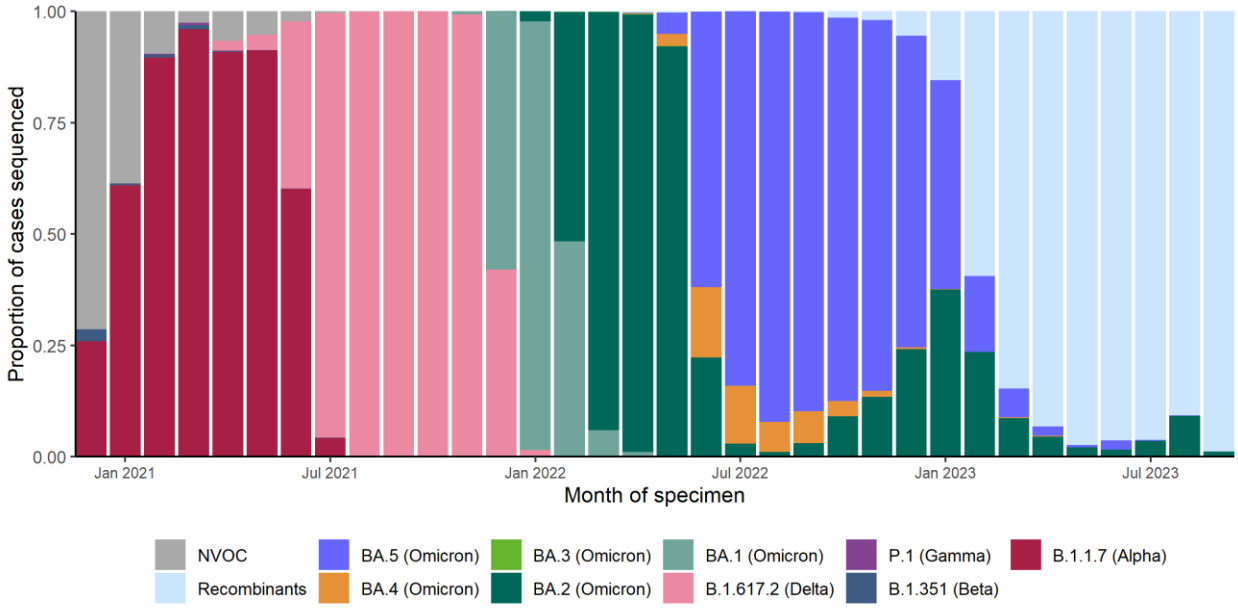

Figure 1b: Proportion of sequenced SARS-CoV-2 specimens, by variant of concern or interest, specimen collection dates, December 2020 to September 2023, Ireland.

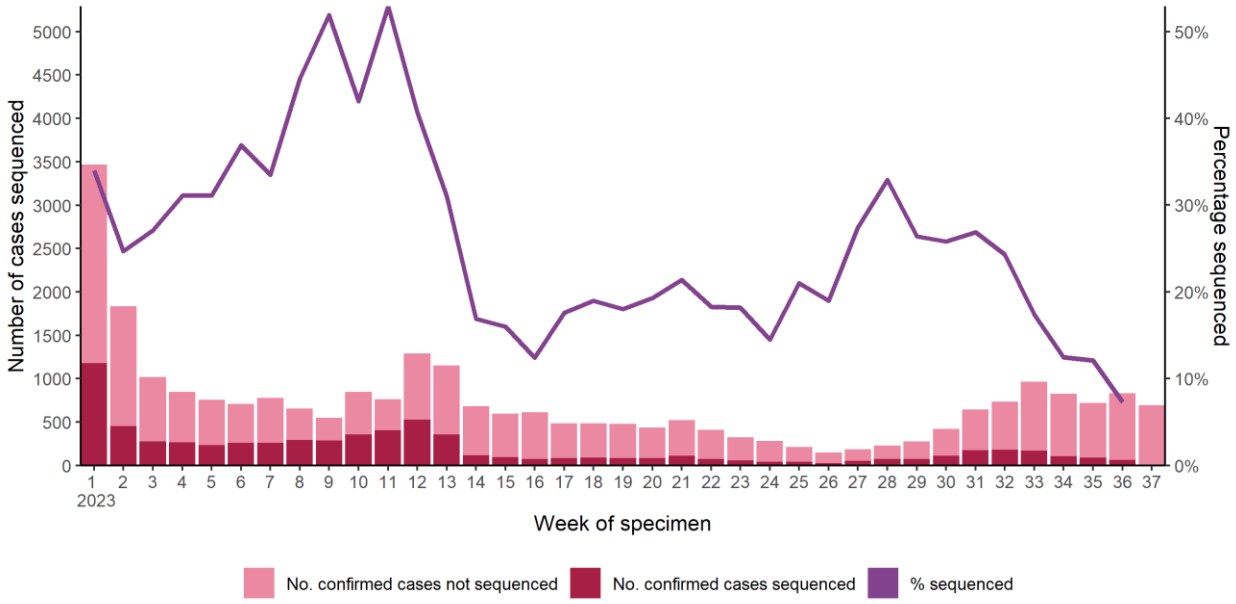

Figure 2: Number of confirmed cases of COVID-19 notified, by number sequenced/not sequenced, and percentage sequenced, week 1 2023 to 36 2023, Ireland.

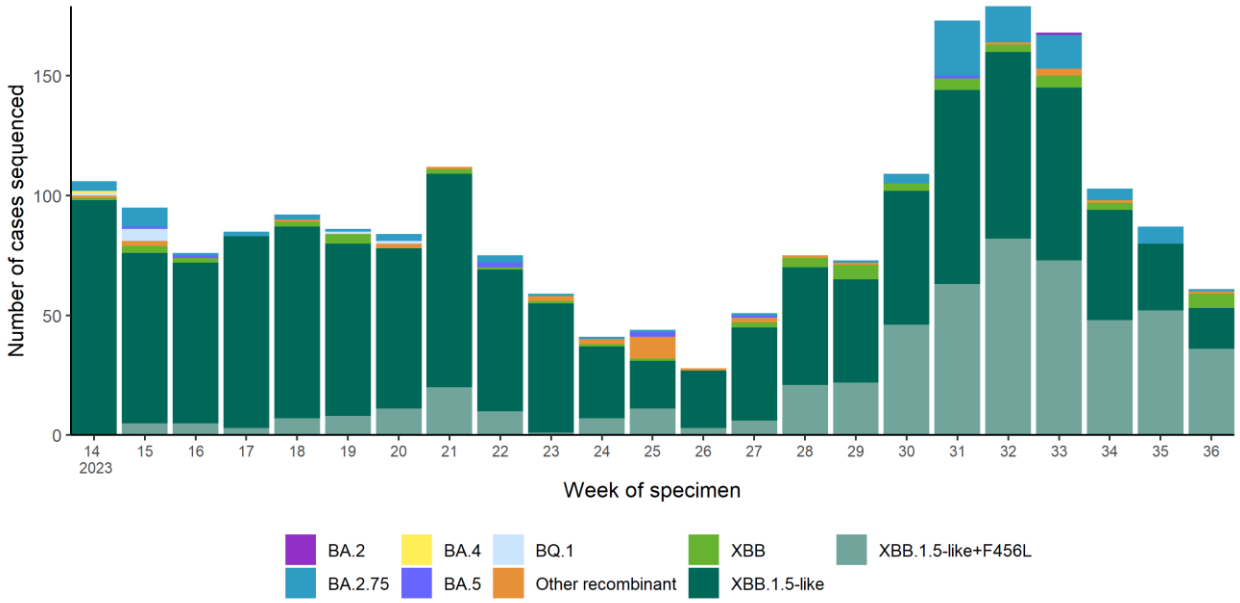

Figure 3a: SARS-CoV-2 whole genome sequencing results, specimen collection dates from week 14 2023 to week 36 2023, Ireland.[1]

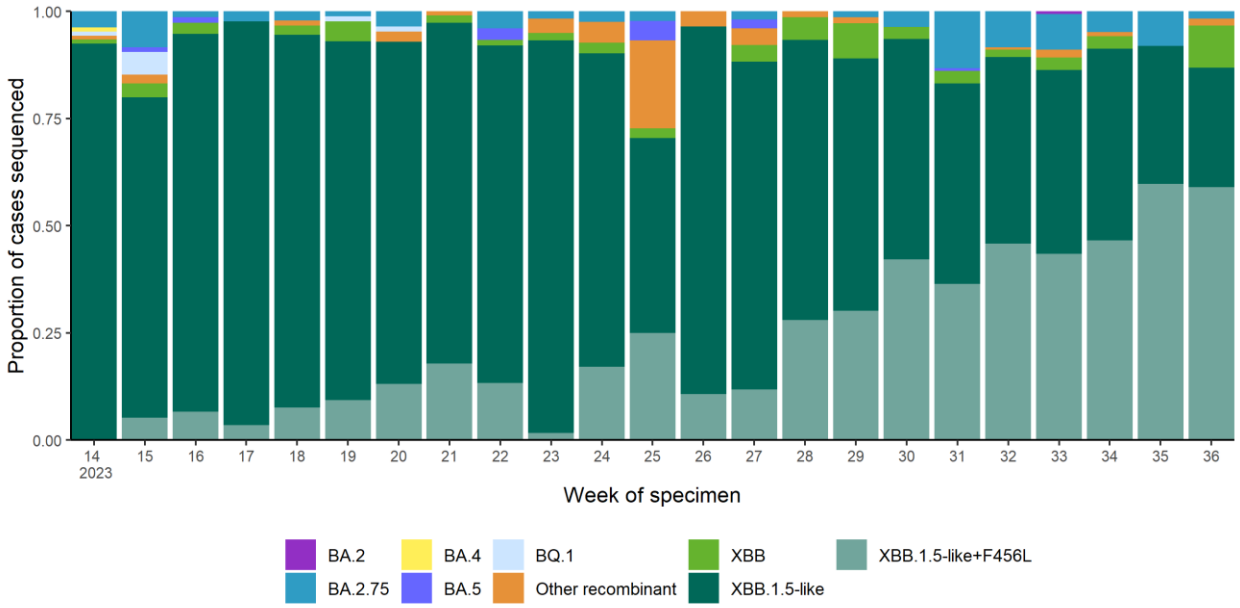

Figure 3b: Proportion of sequenced SARS-CoV-2 specimens by variant, specimen collection dates from week 14 2023 to week 36 2023, Ireland.

[1] As described by the ECDC, 'XBB.1.5-like' and 'XBB.1.5-like + F456L' refer to groupings of lineages that share sets of spike protein mutations

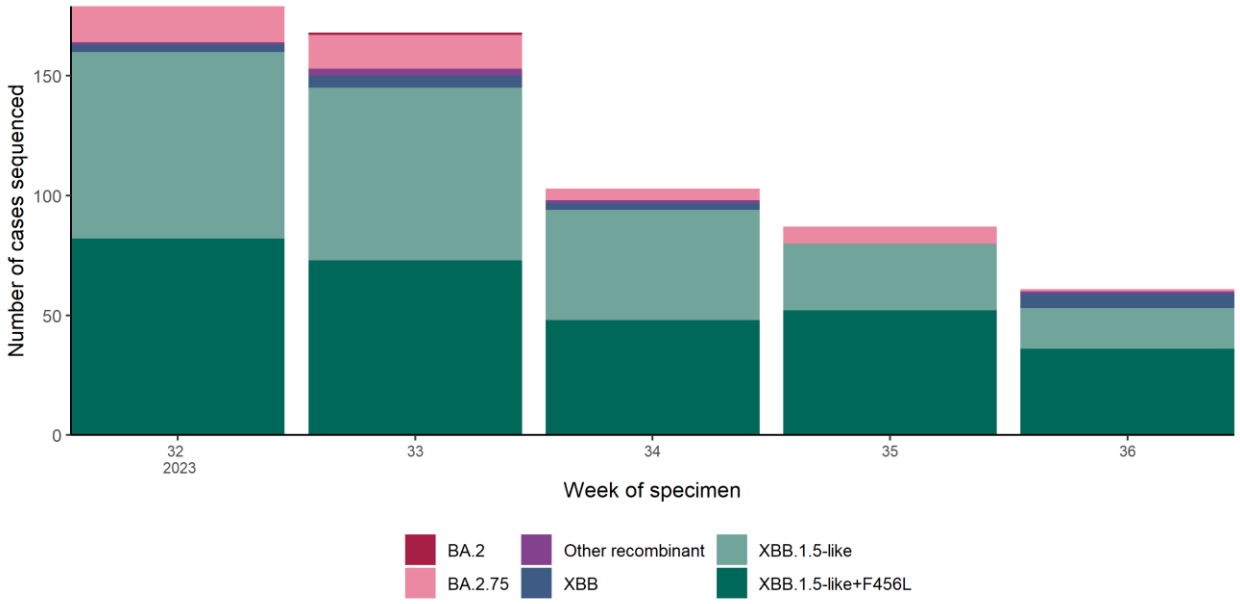

Figure 4a: SARS-CoV-2 whole genome sequencing results by week specimen collected from week 32 2023 to week 36 2023, Ireland.

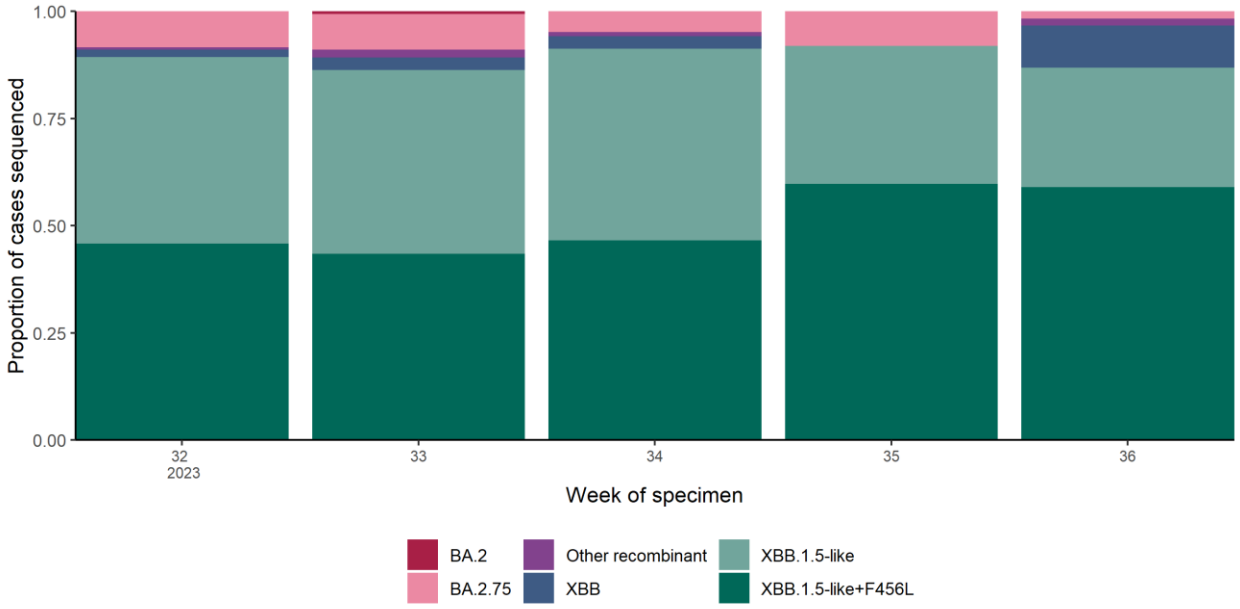

Figure 4b: SARS-CoV-2 whole genome sequencing results by proportion by week specimen collected from week 32 2023 to week 36 2023, Ireland.

Table 1a: Pango lineage designations of COVID-19 cases from week 32 2023 to week 36 2023 by week, Ireland.

Pangolin lineage	32	33	34	35	36	Total
XBB.1.5-like+F456L	82	73	48	52	36	291
XBB.1.5-like	78	72	46	28	17	241
BA.2.75	15	14	5	7	1	42
XBB	3	5	3	0	6	17
Other recombinant	1	3	1	0	1	6
BA.2	0	1	0	0	0	1
Total	179	168	103	87	61	598

Table 1b: Pango lineage designations of COVID-19 cases from week 32 2023 to week 36 2023 by week, Ireland.

Pangolin lineage	32	33	34	35	36	Total
XBB.1.5-like+F456L	45.8%	43.5%	46.6%	59.8%	59.0%	48.7%
XBB.1.5-like	43.6%	42.9%	44.7%	32.2%	27.9%	40.3%
BA.2.75	8.4%	8.3%	4.9%	8.0%	1.6%	7.0%
XBB	1.7%	3.0%	2.9%	0.0%	9.8%	2.8%
Other recombinant	0.6%	1.8%	1.0%	0.0%	1.6%	1.0%
BA.2	0.0%	0.6%	0.0%	0.0%	0.0%	0.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 2: Pango lineage designations of COVID-19 cases in the last five week period (weeks 32 to week 36 2023) and percentage difference in prevalence compared to the previous five week period (weeks 27 to 31 2023), Ireland.

Pangolin lineage	Number of cases last 5 weeks	% last 5 weeks	Number of cases previous 5 weeks	% previous 5 weeks	% difference*
EG.5.1	83	13.9	89	18.5	-4.6
XBB.1.16	70	11.7	70	14.6	-2.9
EG.5.1.1	62	10.4	30	6.2	4.2
XBB.1.16.6	52	8.7	19	4.0	4.7
DV.7	34	5.7	27	5.6	0.1
XBB.1.5	30	5.0	12	2.5	2.5
EG.5.1.3	21	3.5	0	0.0	3.5
XBB.2.3	16	2.7	33	6.9	-4.2
XBB.1.16.11	15	2.5	12	2.5	0.0
GK.1	14	2.3	11	2.3	0.0
EG.5.2	13	2.2	0	0.0	2.2
GE.1	13	2.2	13	2.7	-0.5
XBB.1.9.1	13	2.2	9	1.9	0.3
FL.1.5.1	11	1.8	1	0.2	1.6
FL.20.1	6	1.0	0	0.0	1.0
FU.2	6	1.0	0	0.0	1.0
XBB.1.16.15	6	1.0	0	0.0	1.0
XBB.1.9.2	6	1.0	20	4.2	-3.2
EG.5.1.5	5	0.8	0	0.0	0.8
EG.5.1.6	5	0.8	0	0.0	0.8
XBB.1.5.72	5	0.8	17	3.5	-2.7
XBB.1.5.86	5	0.8	2	0.4	0.4
Total	598	100.8	481	99.4	1.4

*red indicates >=5% increase; green indicates >=5% decrease

Reasons for sequencing

The reason for sequencing is being reported by the hospital laboratories but is not yet routinely reported by the NVRL (Figure 5).

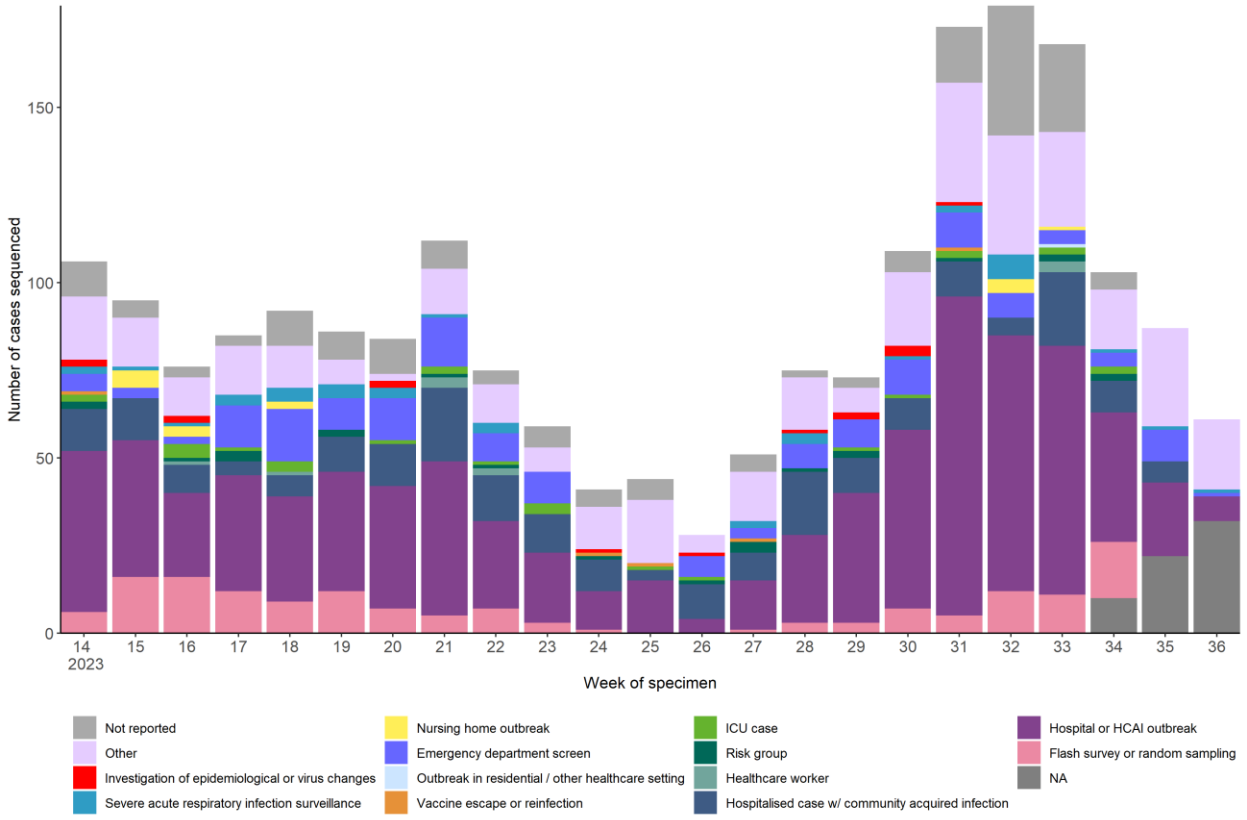

Figure 5: Reason for COVID-19 sequencing results provided from week 14 2023 to week 36 2023, Ireland.

Acknowledgements

Sincere thanks are extended to all those who participate in the collection and reporting of COVID-19 and SARS-CoV-2 sequencing data. This includes the National Virus Reference Laboratory staff, Enfer Laboratories, Beaumont Hospital, St James's Hospital, CHI Crumlin Hospital, St Vincent's University Hospital, Cork University Hospital, University Hospital Limerick, Galway University Hospital, Eurofins/Biomnis, Office of the Chief Information Officer, HSE Integrated Information Services (IIS), HSE Health Intelligence, Strategic Planning & Transformation Unit, notifying clinicians, public health doctors, nurses, surveillance scientists, contact tracers, microbiologists, laboratory staff, staff in ICU units and administration staff.

Appendix

Description of SARS-CoV-2 whole genome sequencing in Ireland

All medical practitioners, including the clinical directors of diagnostic laboratories, are required to notify the Medical Officer of Health (MOH) 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).

The National Virus Reference Laboratory (NVRL) undertakes whole genome sequencing (WGS) on a proportion of confirmed COVID-19 cases. Galway University Hospital, St James's Hospital, University Hospital Limerick, St Vincent's University Hospital, Cork University Hospital, Beaumont Hospital, CHI Crumlin Hospital and Enfer Laboratories have also undertaken sequencing on some confirmed cases of COVID-19. The COVID-19 WGS programme steering committee developed a framework for sequencing to ensure that WGS results included a representative sample of notified COVID-19 cases in the community and in hospitals/ICU. This framework also specified that smaller numbers of specimens from particular categories of cases be targeted for sequencing in order to detect new variants or variants associated with increased disease severity (travel related cases, cases associated with outbreaks in healthcare or other settings and cases with unusual clinical presentations, anti-viral resistance or chronic infection). Due to closure of community test centres on 30/03/2023, there is now a smaller volume of tests being performed as clinically appropriate, largely via GP sentinel sites, SARI surveillance and hospitalised cases, ICU cases and in special settings, e.g. outbreaks in health and care settings. Fully representative community flash surveys are no longer occurring. The framework for sequencing is currently under review.

HPSC link WGS results received from laboratories to epidemiological data on COVID-19 cases reported on the CIDR system. This report summarises WGS results and epidemiological data for COVID-19 cases that have been sequenced in Ireland since week 51 2020 (specimen dates between 13/12/2020 and 09/09/2023). The WGS results included in this report reflect all data available as of 18/09/2023. Epidemiological data on these cases were extracted from CIDR on 18/09/2023. 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.

WHO and ECDC variant working defintions

The World Health Organization (WHO) working definitions for 'SARS-CoV-2 variants of concern' (VOC), 'SARS-CoV-2 variants of interest' (VOI) and 'SARS-CoV-2 variants under monitoring' (VUM) are available here. The WHO list of VOCs, VOIs and VUMs is available here. The ECDC working definitions of list of VOCs, VOIs and VUMs are available here. The European Centre for Disease Prevention and Control (ECDC) list of VOCs, VOIs and VUMs is available here.

Table A1: Sequencing results for COVID-19 cases sampled week 51 2020 to week 36 2023.

Virus Variant	Number of cases	% sequenced cases
Variants of Concern		
Omicron Lineages		
BA.1 (Omicron)	5696	5.4
BA.1.10 (Omicron)	141	0.1
BA.1.15 (Omicron)	616	0.6
BA.1.15.1 (Omicron)	279	0.3
BA.1.17 (Omicron)	2077	2.0
BA.1.1.1 (Omicron)	132	0.1
BA.1.1 (Omicron)	2480	2.3
BA.1.1.15 (Omicron)	1359	1.3
BA.1 sublineages with <100 cases	413	0.4
BA.2 (Omicron)	11517	10.9
BA.2.1 (Omicron)	117	0.1
BA.2.3 (Omicron)	374	0.4
BA.2.36 (Omicron)	134	0.1
BA.2.9 (Omicron)	1003	0.9
BA.2.12.1 (Omicron)	1141	1.1
BA.2.18 (Omicron)	758	0.7
BA.2.23 (Omicron)	145	0.1
BA.2 sublineages with <100 cases	711	0.7
CV.1 (Omicron, BA.2.75 sublineage)	148	0.1
CH.1.1 (Omicron, BA.2.75 sublineage)	1023	1.0
CH.1.1.1 (Omicron, BA.2.75 sublineage)	227	0.2
BN.1 (Omicron, BA.2.75 sublineage)	121	0.1
BN.1.3.1 (Omicron, BA.2.75 sublineage)	141	0.1
BA.2.75 sublineages with <100 cases	787	0.7
BA.3 (Omicron)	11	0.0
BA.4 (Omicron)	1221	1.2
BA.4.1 (Omicron)	425	0.4
BA.4.6 (Omicron)	422	0.4
BA.4 sublineages with <100 cases	211	0.2
BA.5 (Omicron)	1100	1.0
BA.5.1 (Omicron)	3975	3.8

Virus Variant	Number of cases	% sequenced cases
BA.5.1.5 (Omicron)	101	0.1
BA.5.2 (Omicron)	5200	4.9
BA.5.2.1 (Omicron)	346	0.3
BF.1 (Omicron, BA.5.2 sublineage)	199	0.2
BF.5 (Omicron, BA.5.2 sublineage)	270	0.3
BF.7 (Omicron, BA.5.2 sublineage)	567	0.5
BF.11 (Omicron, BA.5.2 sublineage)	122	0.1
BA.5.2.6 (Omicron)	192	0.2
BE.1 (Omicron, BA.5.3 sublineage)	581	0.5
BE.1.1 (Omicron, BA.5.3 sublineage)	669	0.6
BQ.1 (Omicron, BA.5.3 sublineage)	752	0.7
BQ.1.8 (Omicron, BA.5.3 sublineage)	165	0.2
BQ.1.1 (Omicron, BA.5.3 sublineage)	1630	1.5
BQ.1.1.18 (Omicron, BA.5.3 sublineage)	136	0.1
BQ.1.1.22 (Omicron, BA.5.3 sublineage)	535	0.5
BE.9 (Omicron, BA.5.3 sublineage)	123	0.1
BA.5.5 (Omicron)	203	0.2
BA.5.6 (Omicron)	161	0.2
BA.5.9 (Omicron)	145	0.1
BA.5 sublineages with <100 cases	3210	3.0
B.1.1.529	23	0.0
XBB and sublineages	307	0.3
XBB.1.5-like sublineages	3681	3.5
XBB.1.5-like + F456L mutation	559	0.5
Other recombinants	157	0.1
B.1.617.2 (Delta)	28990	27.4
B.1.1.7 (Alpha)	16130	15.3
B.1.351 (Beta)	77	0.1
P.1 (Gamma)	33	0.0
Other variants of non-concern	1523	1.4
Total	**105692**	