Weekly Report on Severe Acute Respiratory Infection (SARI), Week 45 2022 (week ending 13/11/2022)

SARI hospitalised cases that were admitted to St. Vincent's University Hospital (SVUH), Dublin, during the fourth COVID-19 pandemic wave (05/07/2021 and 18/12/2021) and fifth wave (19/12/2021 – 13/11/2022). Please note that this report on SARI surveillance pertains to one hospital site only, data are not nationally representative. Therefore caution is advised when interpreting rates and trends as outlined in the report, which may fluctuate due to the low case numbers.

Key points

- In week 45 2022 (week ending 13/11/2022):
  - There were 20 SARI cases reported in week 45 2022, an increase compared to 11 SARI cases reported during week 44 2022
  - The incidence rate per emergency hospitalisations was 73.5 per 1,000 emergency admissions, an increase compared to 46.4 per 1,000 during week 44 2022
  - The incidence rate per hospital catchment population was 6.6 per 100,000 population aged ≥15 years, an increase compared to the rate of 3.6 per 100,000 in week 44 2022
  - The highest proportion of SARI cases was among those aged 65 years and older (n=15; 75%)
  - Among SARI cases admitted in week 45 2022, 95% (n=19) cases were reported as having underlying medical conditions
  - SARS-CoV-2 PCR testing was carried out on all SARI cases, one (5%) of which was positive, no SARI cases tested positive for SARS-CoV-2 in week 44 2022
  - Influenza PCR testing was carried out on all SARI cases, one (5%) of which tested positive for influenza A (not subtyped), there were no positive influenza cases in week 44 2022.
  - Respiratory syncytial virus (RSV) PCR testing was carried out on all SARI cases, four (20%) of which tested positive, compared to 45.5% (n=5) positivity in week 44 2022
- There were 590 SARI cases admitted to St. Vincent's University Hospital (SVUH) between 19/12/2021 to 13/11/2022 (Omicron, wave 5), compared to 230 SARI cases admitted between 05/07/2021 and 18/12/2021 (Delta, wave 4)
  - The median age of SARI cases admitted during wave 5 was 75 years (interquartile range (IQR): 63 - 83 years), compared to 64 years (IQR: 48-78 years) during wave 4
  - Among SARI cases admitted during wave 5, 94.9% (n=560) reported having underlying medical conditions, compared to 81.3% (n=187) during wave 4
  - Among SARI cases for whom admission to ICU is known, 57.8% (279/483) were reported to have been admitted to ICU and/or required respiratory support during wave 5, compared to 62.6% (144/230) during wave 4
  - Among SARI cases admitted during the 5th wave (since 19/12/2021), who tested positive by PCR for SARS-CoV-2 with known COVID-19 vaccination status, 11.4% (21/184) were not vaccinated, and 32.1% (n=59) had not received a booster vaccine dose >7 days prior to their illness
  - Of those discharged, with known outcome, admitted during wave 5, 10.7% (n=48) died in hospital, compared to 10% (n=23) during wave 4

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Background

Severe acute respiratory infection (SARI) is of major relevance to public health worldwide. Surveillance of SARI is essential to monitor the (co-) circulation of respiratory pathogens and to assess disease severity. Data collected as part of SARI surveillance can provide important early warning information in the context of respiratory disease outbreaks and pandemics. SARI data can also be used as a platform to measure vaccine and antiviral effectiveness and impact.

The objectives of SARI surveillance are:

- To describe the number and incidence of SARI cases by aetiology, time, place and person
- To describe and monitor trends, intensity of activity and severity of SARI infections
- To identify groups at risk of severe disease
- To detect unusual and unexpected events
- To assess the SARI burden of disease in the participating hospital
- To assess and monitor vaccine and antiviral effectiveness

Methods

SARI surveillance was implemented in one tertiary care adult hospital; St. Vincent's University Hospital, Dublin (SVUH). Surveillance commenced on the 5th of July 2021. SARI cases are identified from new admissions through the Emergency Department (E/D).The SARI surveillance system includes people who are aged 15 years or older.

Case definition

SARI cases are identified from new admissions through the Emergency Department, based on clinical symptoms. Patients that develop SARI during their admission, or are admitted through alternate routes, are not included in the surveillance system.

Clinical SARI case:

The European Centre for Disease Prevention and Control (ECDC) clinical SARI case definition is currently used for the SARI surveillance project in Ireland:

- ECDC SARI definition: A hospitalised (defined as hospitalised for at least 24 hours) person with acute respiratory infection, with at least one of the following symptoms: cough, fever, shortness of breath OR sudden onset of anosmia, ageusia or dysgeusia with onset of symptoms within 14 days prior to hospital admission.

The ECDC clinical SARI case definition has been used for the SARI surveillance project since week 34 2021. The World Health Organization (WHO) clinical SARI case definition was used from week 27 to week 33 2021. The WHO SARI definition is defined as follows A hospitalised* person with an acute respiratory infection, and history of fever or measured fever of ≥ 38°C, and cough, and onset within the last 10 days.

Denominator data

Denominator data for hospital catchment area are based on population projections for 2021. Population projections are provided by the Health Intelligence Unit (HIU) of the Health Service Executive (HSE) and were extracted from Health Atlas Ireland on 31/08/2021.

Denominator data on all-cause hospital admissions, via the Emergency Department, were provided by the SVUH statistics department.

Data collection and reporting

Clinical data were collected and managed using REDCap electronic data capture tools hosted at University College Dublin. Laboratory data is extracted from APEX, the laboratory information management system (LIMS), using IBM Cognos software hosted at SVUH.

Case-based data are reported by SVUH to the HSE Health Protection Surveillance Centre (HPSC) on a weekly basis. Data are also reported by HPSC to ECDC via The European Surveillance System (TESSy) on weekly basis as part of European level SARI surveillance.

COVID-19 vaccination data were collected from the National COVID-19 Vaccination Management System (COVAX), and linked to SARI cases by the HSE-Integrated Information service, where data were available.

Reference dates[1]

05/07/2021 (Week 27 2021) – Commencement of SARI surveillance project

27/06/2021 (Week 26 2021) – the beginning of the 4th COVID-19 pandemic wave

19/12/2021 (Week 51 2021) – the beginning of the 5th COVID-19 pandemic wave

Week number refers to the week of hospital admission. Weeks run from Monday to Sunday, as per the international ISO week[2].

[1] Refer to Health Protection Surveillance Centre (hpsc.ie) for further details on the COVID-19 pandemic waves in Ireland
[2] Monday to Sunday (ISO week) used as per ECDC/WHO/international reporting protocol

Results

SARI cases and incidence rates

In total, 590 SARI cases were admitted to St. Vincent's University Hospital (SVUH) during the fifth pandemic wave (between 19/12/2021 and 13/11/2022); 230 SARI cases were admitted during the fourth pandemic wave (between 05/07/2021 to 18/12/2021).

In week 45 2022:

- 20 SARI cases were reported, compared to 11 SARI cases reported in week 44 2022 (Figure 1).
- The SARI incidence rate was 6.6 per 100,000 hospital catchment population aged ≥15 years, compared to the rate of 3.6 per 100,000 in week 44 2022.
- The SARI incidence rate per emergency hospitalisations was 73.5 per 1,000, compared to the rate of 46.4 per 1,000 in week 44 2022.

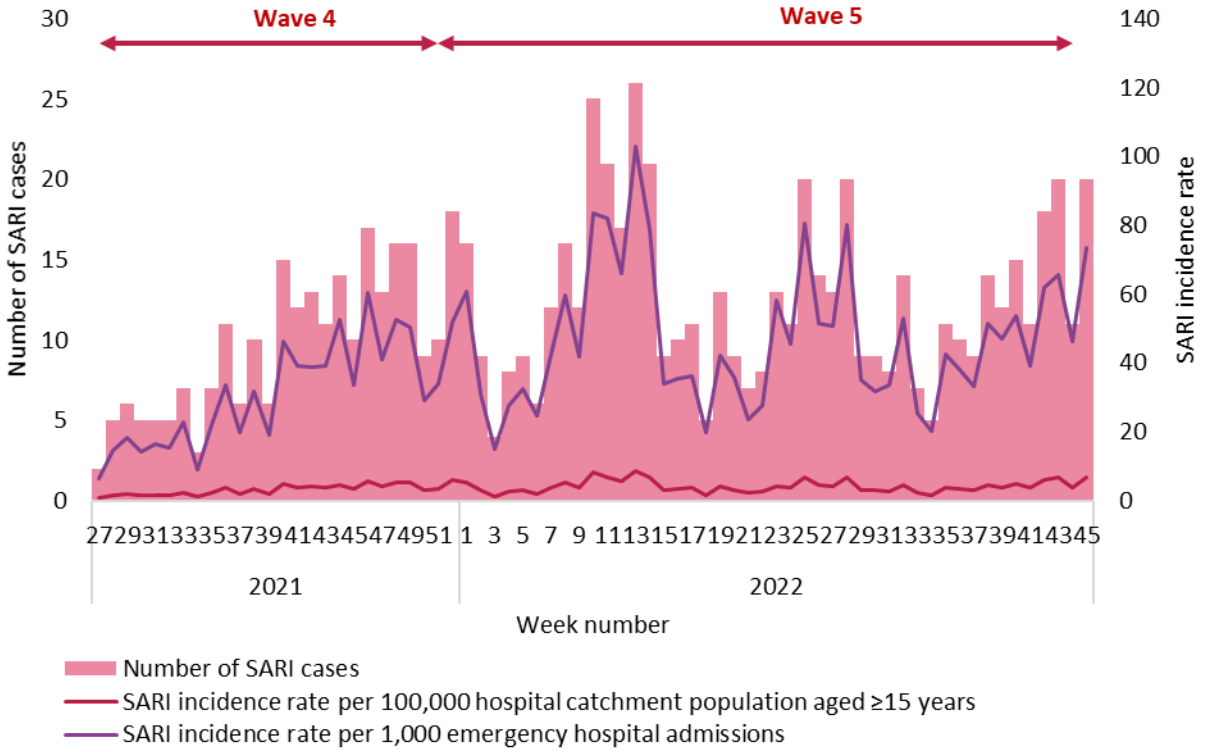

Figure 1 Number and incidence of SARI hospitalised cases (emergency admission) by week of hospital admission, week 27 2021 to week 45 2022 (n=820).

NOTE: Data were extracted from the SARI surveillance database at HPSC on 16/11/2022, and are subject to ongoing review, validation and update. As a result, figures in this report may differ from previously published figures.

Demographics

In week 45 2022, of the 20 SARI cases reported:

- Females accounted for a higher proportion of SARI cases (n=11, 55%) (Table 1)
- The median age of SARI cases admitted was 75 years (interquartile range: 66 - 83 years)
- The incidence rate amongst those aged 65 years and older was 25.0 per 100,000, compared to the rate of 13.3 per 100,000 in week 44 2022.

Table 1 Number and proportion of SARI cases by sex and age, for week 45 2022 and by pandemic wave.

		Week 45, 2022		Wave 5		Wave 4	
		n	%	n	%	n	%
Total number of SARI cases		20		590		230	
Sex	Male	9	45.0	308	52.2	120	52.2
	Female	11	55.0	282	47.8	110	47.8
Age (years)	Mean	72		72		63	
	Median	75		75		64	
	Interquartile range	66 - 83		63 - 83		48 - 78	
	Range	21 - 89		16 - 101		19 - 100	
Age group	15-24 years	1	5.0	15	2.5	5	2.2
	25-34 years	0	0.0	13	2.2	12	5.2
	35-44 years	0	0.0	17	2.9	27	11.7
	45-54 years	0	0.0	42	7.1	33	14.3
	55-64 years	4	20.0	73	12.4	40	17.4
	65-74 years	5	25.0	122	20.7	44	19.1
	75-84 years	6	30.0	180	30.5	39	17.0
	85+ years	4	20.0	128	21.7	30	13.0

*Surveillance excludes children under 15 years of age

The incidence rate per 100,000 hospital catchment population by age group is shown in Figure 2.

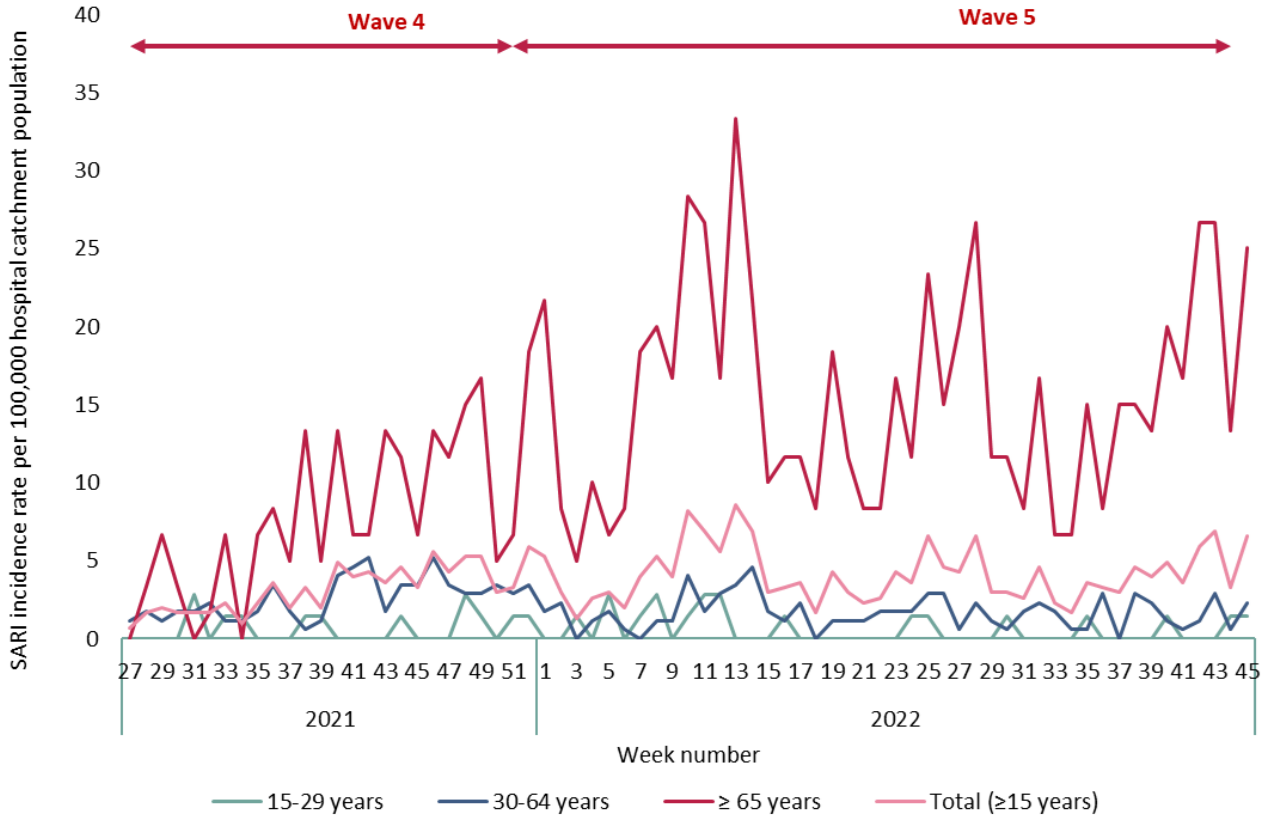

Figure 2 SARI incidence rate per 100,000 hospital catchment population by age group and week of hospital admission, week 27 2021 to week 45 2022 (n=820)

Underlying medical conditions and risk factors

Information on underlying medical conditions was reported for 818 (99.8%) SARI cases. Of those admitted during wave 5, 94.9% (n=560) reported having underlying medical conditions, compared to 81.3% (n=187) during wave 4.

Table 2 displays the number and proportion of individual underlying medical conditions, where known, among those who reported having underlying medical conditions. The most common underlying medical conditions reported during wave 5 were heart disease (n=229, 40.9%) and hypertension (n=224, 40%); which were also observed during wave 4.

Among female SARI cases admitted during wave 5, four (1.4%) were reported as being pregnant at the time of admission, compared to 1.8% (n=2) female SARI cases during wave 4.

Healthcare workers accounted for 2.4% (n=14) of SARI cases admitted during wave 5, compared to 4.8% (n=11) during wave 4.

Table 2 Number and proportion of SARI cases with pre-existing conditions, reported on hospital admission, for week 45 2022 and by pandemic wave.

Underlying medical condition*	Week 45 2022 (n=19)		Wave 5 (n=560)		Wave 4 (n=187)	
	n	%	n	%	n	%
Heart disease	9	45.0	229	**40.9**	57	**30.5**
Hypertension	10	50.0	224	**40.0**	75	**40.1**
Lung disease	8	40.0	187	33.4	55	29.4
Cancer	5	25.0	119	21.3	38	20.3
Neurological disease	6	30.0	101	18.0	34	18.2
Asthma	4	20.0	78	13.9	28	15.0
Diabetes	7	35.0	92	16.4	37	19.8
Kidney disease	1	5.0	38	6.8	20	10.7
Intellectual disability	1	5.0	27	4.8	14	7.5
Immunocompromised	0	0.0	16	2.9	7	3.7
Obesity	0	0.0	17	3.0	20	10.7
Cystic fibrosis	0	0.0	3	0.5	2	1.1
Other chronic conditions**	8	40.0	270	48.2	120	64.2

*SARI cases could be reported with one or more underlying medical condition

** Data reported on other chronic conditions may include some of the chronic conditions listed above; these data are under review and may change over time.

Symptoms

Information on clinical symptoms, either at or prior to hospital admission, was reported for all SARI cases. The most common symptoms during both waves 4 and 5, were cough and shortness of breath (Table 3).

Table 3 Number and proportion of SARI cases with clinical symptoms, either at or prior to hospital admission, for week 45 2022 and by pandemic wave.

Clinical symptom*	Week 45 2022 (n=20)		Wave 5 (n=590)		Wave 4 (n=230)	
	n	%	n	%	n	%
Cough	18	**90.0**	460	**78.0**	206	**89.6**
Shortness of breath	13	**65.0**	438	**74.2**	190	**82.6**
Fever	8	40.0	277	46.9	117	50.9
General deterioration	12	60.0	239	40.5	88	38.3
Malaise	1	5.0	84	14.2	67	29.1
Headache	1	5.0	35	5.9	29	12.6
Muscular pain	0	0.0	39	6.6	21	9.1
Sore throat	0	0.0	41	6.9	12	5.2
Ageusia	0	0.0	5	0.8	16	7.0
Anosmia	0	0.0	5	0.8	13	5.7
Dysgeusia	0	0.0	7	1.2	7	3.0

*SARI cases could be reported with one or more clinical symptom

Severe clinical course during hospitalisation

Information on the clinical course during hospitalisation is only available after discharge; information on ICU admission is available prior to discharge.

In summary, 76.1% (n=449) of SARI cases admitted during wave 5 have discharge information available, compared to all SARI cases admitted during wave 4.

Among those for whom discharge information is available, and who were admitted during wave 5, 13.1% (n=59) were reported as having pneumonia, compared to 28.7% (n=66) during wave 4 (Table 4).

Information on ICU admission is available for 81.9% (n=483) of SARI cases admitted during wave 5 and for all cases admitted during wave 4. Among those, 57.8% (n=279) were admitted to ICU and/or required respiratory support during wave 5, compared to 62.6% (n=144) admitted during wave 4.

Data collection is ongoing for those not yet discharged from hospital.

Table 4 Number and proportion of SARI cases by complication, respiratory support and ICU admission, for wave 4 and wave 5

	Wave 5 (n=449)		Wave 4 (n=230)	
Complications*	**n**	**%**	**n**	**%**
Pneumonia	59	13.1	66	28.7
Sepsis	11	2.4	5	2.2
ARDS	43	9.6	5	2.2
Myocarditis	0	0.0	2	0.9
Long COVID	1	0.2	1	0.4
Multiorgan failure	1	0.2	0	0.0
Other complications**	123	27.4	45	19.6
No complications	241	53.7	129	56.1
Unknown	5	1.1	2	0.9
	Wave 5 (n=450)		**Wave 4 (n=230)**	
Respiratory support	**n**	**%**	**n**	**%**
High-flow oxygen therapy (non-invasive ventilation)	261	58.0	127	55.2
Invasive ventilation	15	3.3	17	7.4
Other respiratory support	0	0.0	0	0.0
No respiratory support given	174	38.7	86	37.4
	Wave 5 (n=483)		**Wave 4 (n=230)**	
Admitted to ICU	**n**	**%**	**n**	**%**
Yes	25	5.2	19	8.3
No	458	94.8	211	91.7

*SARI cases could be reported with one or more complication

**Data reported on “other complications” may include some of the complications listed above; these data are under review and may change over time.

Laboratory testing for SARS-CoV-2, influenza and RSV

PCR testing:

SARS-CoV-2 PCR testing is carried out on admission. For a small proportion of SARI cases, there is a lag time with testing for influenza and RSV[3].

In week 45 2022:

- SARS-CoV-2 PCR testing was carried out on all SARI cases, one (5%) of which was positive, there were no positive cases in week 44 2022 (Figure 3)
- Influenza PCR testing was carried out on all cases, one (5%) of which was positive (influenza A (not subtyped), there were no positive cases in week 44 2022.
- RSV PCR testing was carried out on all SARI cases, four (20%) of which were positive, compared to 45.5% (n=5) in week 44 2022.

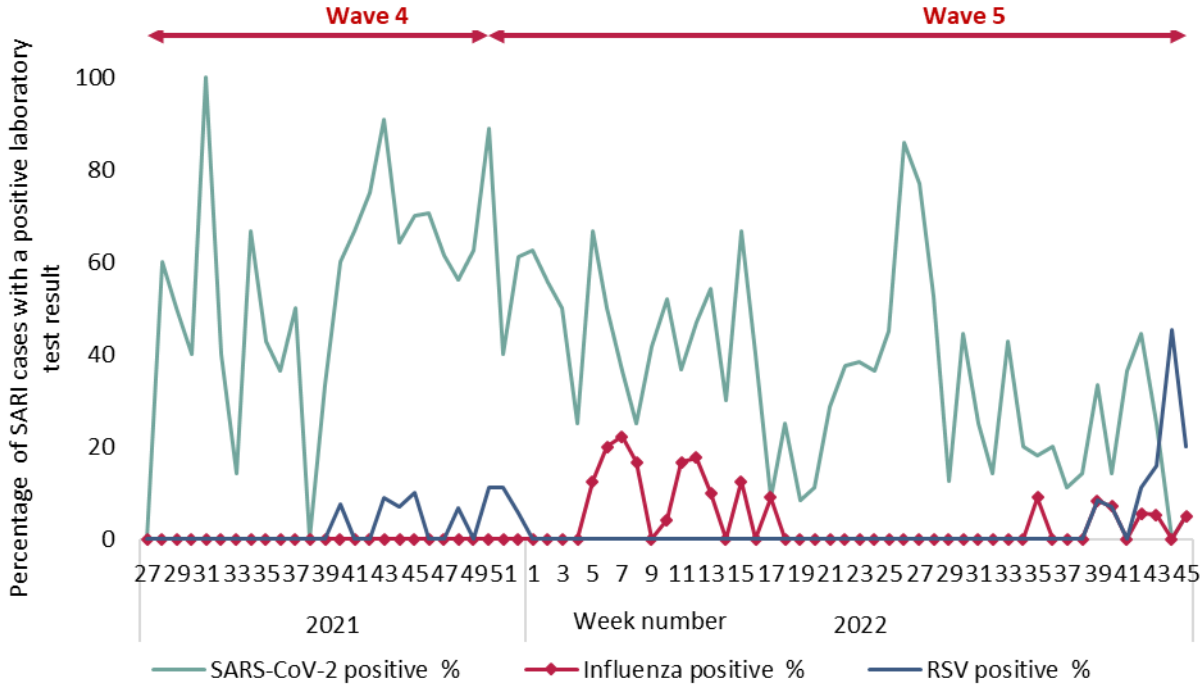

Figure 3 Percentage of SARI cases with a positive laboratory test result for SARS-CoV-2, influenza and RSV by week, weeks 27 2021 - 45 2022

Of those admitted to SVUH during wave 5, 37% (n=214) tested positive by PCR for SARS-CoV-2, compared to 57.2% (n=131) during wave 4 (Table 5).

During the 2022/2023 influenza season (weeks 40-45 2022), 4.2% (4 of 95) of those admitted tested positive for influenza A; 2 A(H1)pdm09; 1 A(H3) and 1 A(not subtyped). Two (0.9%) SARI cases admitted during the 2022 summer season (weeks 21 to 39 2022), tested positive for influenza A; 1 A(H1)pdm09 and 1 A(H3).

[3] Due to reagent supply issues, samples are occasionally sent to external laboratories for influenza and RSV testing.

During the 2021/2022 influenza season (weeks 40 2021 to 20 2022), 4% (17 of 425) of those admitted tested positive for influenza A, 16 A(H3), 1 A (not subtyped)

During 2022/2023 season (weeks 40-45 2022) 15.8% (15 of 95) of those admitted tested positive for RSV, 1 (<0.5%) SARI case admitted during the 2022 summer season (weeks 21 to 39 2022) tested positive for RSV.

During the 2021/2022 season (weeks 40 2021 to 20 2022) 1.9% (8 of 425) of those admitted tested positive for RSV.

Table 5 Number and proportion of SARI cases by laboratory test result, for week 45 2022 and by pandemic wave

Laboratory test	Laboratory test result	Week 45 2022		Wave 5		Wave 4	
		n	%	n	%	n	%
Tested for SARS-CoV-2	Total tested	20		579		229	
	Positive	1	**5.0**	214	**37.0**	131	**57.2**
	Negative	19	95.0	338	58.4	90	39.3
	Indeterminate*	0	0.0	27	4.7	8	3.5
Tested for influenza A	Total tested	20		547		165	
	Positive	1	**5.0**	23	**4.2**	0	**0.0**
	Negative	19	95	524	95.8	165	100
Tested for influenza B	Total tested	20		547		165	
	Positive	0	**0.0**	0	**0.0**	0	**0.0**
	Negative	20	100	547	100	165	100
Tested for RSV	Total tested	20		547		165	
	Positive	4	**20.0**	18	**3.3**	6	**3.6**
	Negative	16	80	529	96.7	159	96.4

* Ct value (cycle threshold) >30

Genomic analysis:

SARS-CoV-2:

SARI samples that are positive for SARS-CoV-2 and that have a cycle threshold (Ct) value <25 are referred to the National Virus Reference Laboratory (NVRL) for whole genome sequencing (WGS). In total, for both waves 4 and 5, 267 (77.4%) SARS-CoV-2 positive SARI samples have met the Ct criteria for WGS; 237 (88.8%) have been sent for WGS, 3 (1.1%) samples are waiting to be sent and 27 (10.1%) SARI samples that met the Ct eligibility criteria were not sent for WGS, for reasons such as insufficient sample volume, or the sample could not be located.

Of the 237 samples sent to NVRL for WGS, results have been received for 202 (85.2%) samples, 14 (5.9%) samples could not be sequenced (due to insufficient sample volume or high Ct value), and 21 (8.9%) are currently being sequenced and results are pending.

All SARI cases that have undergone whole genome sequencing up to week 47 2021 were Delta (B.1.617.2) and Delta sublineages. In total, 31.2% (63 of 202) of all sequenced SARI cases reported since July 2021 (weeks 28 2021 to week 36 2022) were identified as Delta variant. The last Delta variant SARI case was detected in week 1 2022.

The first Omicron variant was identified in a SARI case admitted to SVUH in week 48 2021. Between weeks 2 and 36 2022 inclusive, all SARI cases sequenced and reported from the NVRL were Omicron variants, in total 68.8% (139 of 202) of sequenced SARI cases were identified as Omicron. Figure 4 shows sequenced SARI cases by week of hospitalisation and Pango Lineage, further information on Pango Lineage is available in the appendix (Table A1).

ECDC has placed the Omicron BA.4 and BA.5 sublineages with the spike mutation R346X on the list of variants under monitoring (VUMs). There have been two SARI cases identified with this mutation, admitted in weeks 34 and 36 2022.

Further sequencing data on cases admitted since week 36 2022, are not yet available.

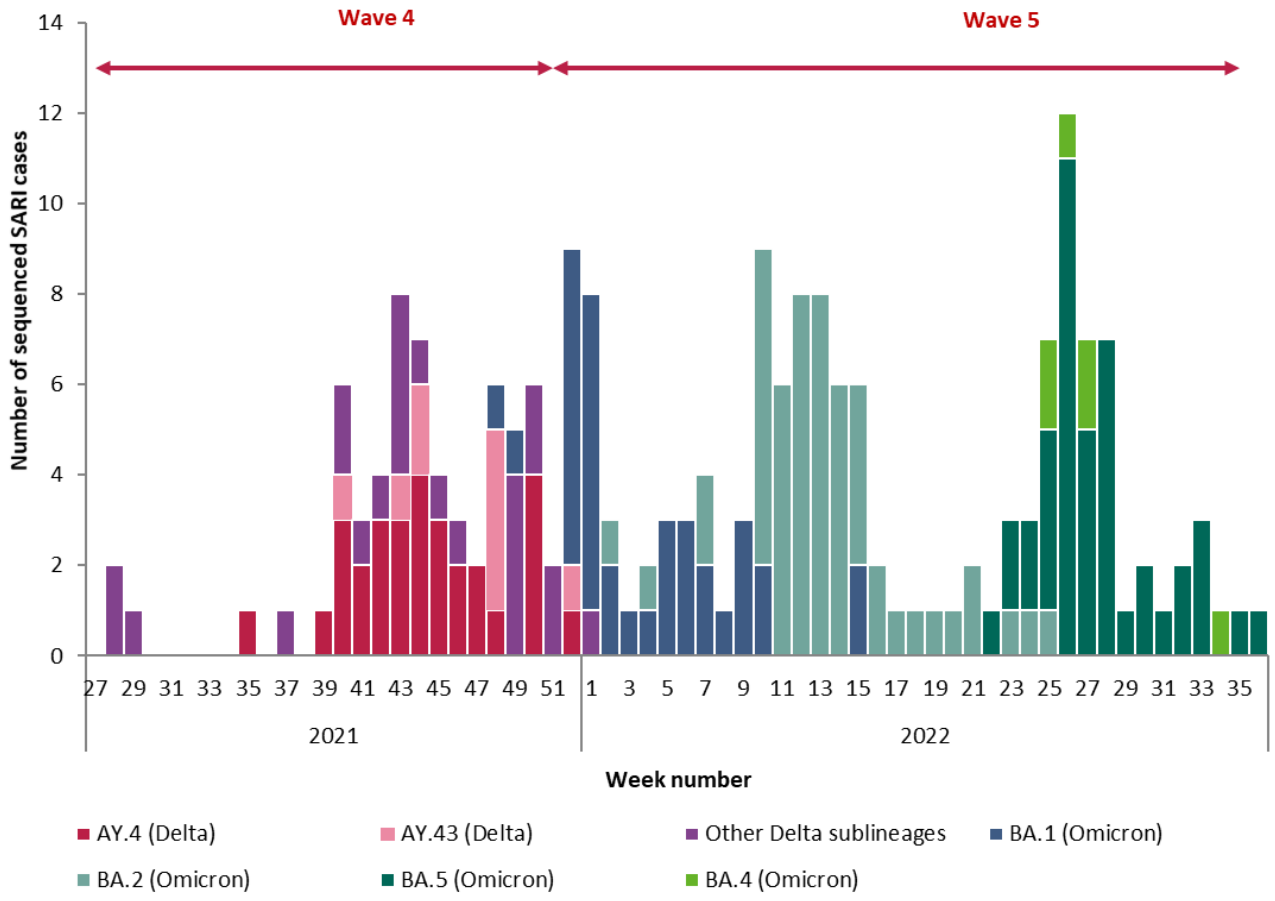

Figure 4 Number of SARI cases sequenced and reported by the National Virus Reference Laboratory, by week of hospitalisation, week 27 2021 to week 36 2022, (n=202)

COVID-19 Vaccination status

Amongst the SARI cases, admitted during wave 5 (since 19/12/2021), who tested positive by PCR for SARS-CoV-2 with known COVID-19 vaccination status, 11.4% (21/184) were not vaccinated and 32.1% (n=59) had not received either a first or second booster vaccine dose >7 days prior to the epidemiological date of their episode of illness. (Table 6).

Vaccination data are available approximately one week after cases are notified, therefore the vaccination status for the current week's SARI cases is recorded as unknown.

Refer to the technical notes for the full list of definitions regarding epidemiological date and COVID-19 vaccination status[4].

NOTE: Data are provisional and subject to ongoing review, validation and update.

Table 6 Number and proportion of SARI cases by COVID-19 vaccination status, SARS-CoV-2 PCR result and date of hospitalisation

SARS CoV-2 PCR positive	Admitted since rollout of second booster[1] (n=255)		Admitted since rollout of first booster[2] (n=600)		Admitted during wave 5[3] (n=461)		Admitted during wave 4[4] (n=204)	
Vaccine status	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Not vaccinated	9	11.0	54	19.4	21	11.4	48	40.3
Primary series - Partial	0	0.0	1	0.4	1	0.5	2	1.7
Primary series - Complete	8	9.8	95	34.2	37	20.1	66	55.5
First booster	46	56.1	109	39.2	106	57.6	3	2.5
Second booster	19	23.2	19	6.8	19	10.3	0	0.0
Total	**82**	**100**	**278**	**100**	**184**	**100**	**119**	**100**
SARS CoV-2 PCR negative								
Vaccine status	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Not vaccinated	3	1.7	14	4.3	9	3.2	9	10.6
Primary series - Partial	0	0.0	0	0.0	0	0.0	1	1.2
Primary series - Complete	14	8.1	55	17.1	31	11.2	59	69.4
First booster	103	59.5	200	62.1	184	66.4	16	18.8
Second booster	53	30.6	53	16.5	53	19.1	0	0.0
Total	**173**	**100**	**322**	**100**	**277**	**100**	**85**	**100**

[1]The second COVID-19 vaccination booster was rolled out on 22/04/2022

[2]The first COVID-19 vaccination booster was rolled out on 27/09/2021

[3]Wave 5 from 19/12/2021 to present; [4]Wave 4 from 05/07/2021 to 18/12/2021

Table 7 displays the clinical course and outcome of those admitted during wave 5 by SARS CoV-2 PCR result and vaccination status. Data collection for clinical course and outcome is on-going for those admitted during wave 5.
Further information on those admitted during wave 4 is available in the appendix (Table A2).

[4] Refer to www.hse.ie for further information on the COVID-19 vaccination rollout.

Table 7 Number and proportion of SARI cases, admitted during wave 5 (19/12/2021 to 13/11/2022), by COVID-19 vaccination status, and SARS-CoV-2 PCR result (n=461)

SARS CoV-2 PCR positive			Required respiratory support		ICU admission		Died in hospital	
Vaccination status	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Not vaccinated	21	11.4	11	12.4	1	12.5	1	5.6
Primary series - Partial	1	0.5	1	1.1	0	0.0	0	0.0
Primary series - Complete	37	20.1	22	24.7	2	25.0	5	27.8
First booster	106	57.6	49	55.1	4	50.0	11	61.1
Second booster	19	10.3	6	6.7	1	12.5	1	5.6
Total	**184**	**100**	**89**	**100**	**8**	**100**	**18**	**100**
SARS CoV-2 PCR negative								
Vaccination status	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Not vaccinated	9	3.2	4	3.0	0	0.0	0	0.0
Primary series - Partial	0	0.0	0	0.0	0	0.0	0	0.0
Primary series - Complete	31	11.2	18	13.6	1	12.5	3	17.6
First booster	184	66.4	95	72.0	7	87.5	12	70.6
Second booster	53	19.1	15	11.4	0	0.0	2	11.8
Total	**277**	**100**	**132**	**100**	**8**	**100**	**17**	**100**

Outcome

Of the 590 SARI cases admitted during wave 5, 76.1% (n=449) have been discharged (Table 8). During wave 4, 230 SARI cases were admitted to St Vincent's University Hospital, all of these cases have been discharged.

Of the 48 cases admitted during wave 5, who died in hospital, 35 (72.9%) were male and 13 (27.1%) were female. The median age was 82 years (interquartile range 75 – 87 years).

Of the 23 cases admitted during wave 4, who died in hospital, 17 (73.9%) were male and six (26.1%) were female. The median age was 85 years (interquartile range 73 – 91 years).

Table 8 Number and proportion of discharged SARI cases by outcome and hospital length of stay and by pandemic wave.

		Wave 5 (n=449)		Wave 4 (n=230)	
		n	**%**	**n**	**%**
Outcome	Discharged alive	390	86.9	202	87.8
	Transferred to another hospital	11	2.4	5	2.2
	Died in hospital	48	10.7	23	10.0
Hospital length of stay (number of days)	Mean	11		14	
	Median	6		6	
	Interquartile range	3 - 13		3 - 13	
	Range	1 - 123		1 - 347	

Acknowledgements

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Technical notes

1. SARI case

A SARI case refers to an individual patient episode of care.

2. Epidemiological date

Epidemiological date is used to determine timing of Severe Acute Respiratory Infections. Epidemiological date is based on the earliest date available on the case, taken from date of onset of symptoms, laboratory specimen collection date, and date of hospitalisation.

3. Vaccination status

For the purposes of SARI surveillance, vaccination status of cases is as follows:

- **Primary vaccination series – Partial completion**, if:
  - Received one dose of a recommended two-dose vaccine schedule and the epidemiological date is ≥14 days after receipt of dose one.
  - Date of receipt of dose two of a recommended two-dose vaccine schedule is <14 days before the epidemiological date.
  - No identifiable linked record on the National COVID-19 Immunisation system, of receiving dose two of a recommended two-dose COVID-19 vaccine schedule.

- **Primary vaccination series - Complete**, if:
  - Received one dose of a recommended one-dose vaccine schedule, and the epidemiological date is ≥14 days after receipt of the dose.
  - Received two doses of a recommended two-dose vaccine schedule, and the epidemiological date is ≥14 days after receipt of the second dose.
  - Received three doses of a recommended three-dose vaccine schedule, and the epidemiological date is >7 days after receipt of the third dose. The recommended primary series for immunocompromised individuals is three doses of a recommended vaccine.
  - Date of receipt of first booster dose is ≤7 days before the epidemiological date.
  - There is no identifiable linked record on the National COVID-19 Immunisation system of receiving a booster dose of a recommended COVID-19 vaccine schedule.

- **First booster dose**, if:
  - They had a first booster dose of a recommended vaccine schedule, and the epidemiological date is >7 days after receipt of the booster dose.
  - Date of receipt of second booster dose is ≤7 days before the epidemiological date.
  - There is no identifiable linked record on the National COVID-19 Immunisation system of receiving a second booster dose of a recommended COVID-19 vaccine schedule.

- **Second booster dose**, if:
  - They had a second booster dose of a recommended vaccine schedule, and the epidemiological date is >7 days after receipt of the booster dose.

- **Not vaccinated**, if the following applies:
    - Vaccination record on the National COVID-19 Immunisation system indicates the person was vaccinated after the epidemiological date.
    - The SARI patient was reported as not vaccinated on the SARI hospital clinical questionnaire, and there is no identifiable linked record of COVID-19 vaccination on the National COVID-19 Immunisation system.

- **Vaccine status unknown**, if:
    - The SARI patient is reported on the SARI hospital clinical questionnaire as vaccinated, however there is no identifiable linked record of COVID-19 vaccination on the National COVID-19 Immunisation system. Vaccination status is reported as unknown, until verified on the National COVID-19 Immunisation system.
    - The SARI patient is reported on the SARI hospital clinical questionnaire as vaccination status unknown, AND there is no identifiable linked record of COVID-19 vaccination on the National COVID-19 Immunisation system

Appendix

Table A1

Number and proportion of SARI cases sequenced and reported by the National Virus Reference Laboratory, by Pango lineage, SARI cases week 27 2021 to week 36, 2022, (n=202)

Virus variant	Number of cases	% sequenced cases
Total sequenced	**202**	
Delta and Delta sublineages:	**63**	**31.2**
AY.4	30	14.9
AY.43	9	4.5
B.1.617.2	5	2.5
AY.122	4	2.0
AY.5	4	2.0
AY.4.5	2	1.0
AY.4.6	2	1.0
AY.4.2.2	1	0.5
AY.6	1	0.5
AY.4.10	1	0.5
AY.46.6	1	0.5
AY.98	1	0.5
AY.4.2*	2	1.0
Omicron sublineages	**139**	**68.8**
BA.1 lineages:		
BA.1	22	10.9
BA.1.1	14	6.9
BA.2 lineages:		
BA.2	40	19.8
BA.2.9	6	3.0
BA.2.3	5	2.5
BA.2.1	1	0.5
BA.2.18	1	0.5
BA.2.40.1	1	0.5
BA.4 lineages:		
BA.4	3	1.5
BA.4.1	1	0.5
BA.4.4	1	0.5
BA.4.6	1	0.5
BA.5 lineages:		
BA.5.1	18	8.9
BA.5.2.1	8	4.0
BA.5	5	2.5
BA.5.2	5	2.5
BE.1	4	2.0
BA.5.3	1	0.5
BF.1	1	0.5
BF.7	1	0.5

* Variant of interest

Table A2

Number and proportion of SARI cases, admitted during wave 4 (05/07/2021 to 18/12/2021), by COVID-19 vaccination status, and SARS-CoV-2 PCR result (n=204)

SARS CoV-2 PCR positive			Required respiratory support		ICU admission		Died in hospital	
Vaccination status	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Not vaccinated	48	40.3	38	48.1	7	43.8	4	26.7
Primary series - Partial	2	1.7	1	1.3	0	0.0	0	0.0
Primary series - Complete	66	55.5	37	46.8	8	50.0	10	66.7
First booster	3	2.5	3	3.8	1	6.3	1	6.7
Second booster	0	0.0	0	0.0	0	0.0	0	0.0
Total	**119**	**100**	**79**	**100**	**16**	**100**	**15**	**100**
SARS CoV-2 PCR negative								
Vaccination status	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Not vaccinated	9	10.6	6	12.8	0	0.0	0	0.0
Primary series - Partial	1	1.2	1	2.1	1	33.3	0	0.0
Primary series - Complete	59	69.4	32	68.1	1	33.3	5	71.4
First booster	16	18.8	8	17.0	1	33.3	2	28.6
Second booster	0	0.0	0	0.0	0	0.0	0	0.0
Total	**85**	**100**	**47**	**100**	**3**	**100**	**7**	**100**