



Weekly Report on Severe Acute Respiratory Infection (SARI), Week 49 2022 (week ending 11/12/2022)

This report includes data on SARI hospitalised cases, aged 15 years and older who were admitted to St. Vincent's University Hospital (SVUH), Dublin up to week 49 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 49 2022 (week ending 11/12/2022):
 - There were 23 SARI cases reported in week 49 2022, an increase compared to 13 SARI cases reported during week 48 2022
 - The incidence rate per emergency hospitalisations was 89.8 per 1,000 emergency admissions, an increase compared to 55.1 per 1,000 during week 48 2022
 - The incidence rate per hospital catchment population was 7.6 per 100,000 population aged ≥15 years, an increase compared to the rate of 4.3 per 100,000 in week 48 2022
 - The highest proportion of SARI cases was among those aged 65 years and older (n=14; 60.9%), median age was 71 years (interquartile range (IQR): 60–78)
 - Among SARI cases admitted in week 49 2022, 21 (91.3%) were reported as having underlying medical conditions
 - SARS-CoV-2 PCR testing was carried out on 22 (95.6%) SARI cases, three (13.6%) of which tested positive, a decrease compared to 53.8% (n=7) in week 48 2022
 - Influenza PCR testing was carried out on 21 (91.3%) SARI cases, six (28.6%) of which tested positive for influenza A (not subtyped), compared to 7.7% (n=1) positivity in week 48 2022.
 - Respiratory syncytial virus (RSV) PCR testing was carried out on 21 (91.3%) SARI cases, three (14.3%) of which tested positive, compared to 23.1% (n=3) positivity in week 48 2022
- There were 81 SARI cases admitted to St. Vincent's University Hospital (SVUH) between weeks 46 and 49 2022. In total, during 2022, 650 SARI cases have been admitted to SVUH
 - The median age of SARI cases admitted during weeks 46-49 2022 was 72 years (IQR: 63-80 years), the median age of all cases admitted in 2022 was 75 years (IQR: 63-83 years)
 - Among SARI cases admitted during weeks 46–49 2022, 87.7% (n=71) reported having underlying medical conditions; overall 94.5% (n=614) of those admitted during 2022 reported having underlying conditions
 - Among SARI cases for whom admission to ICU is known, admitted during weeks 46-49 2022, 45.5% (15/33) were reported to have been admitted to ICU and/or required respiratory support, compared to 58.0% (318/548) during weeks 1-49 2022
 - Among SARI cases admitted since the roll-out of the second COVID-19 booster (22/04/2022) who tested positive by PCR for SARS-CoV-2 with known vaccination status, 73.9% (65/88) had not received a second booster vaccine dose >7 days prior to their onset of illness
 - Of those discharged, with known outcome, admitted during 2022, 10.2% (n=53) died in hospital

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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 $\geq 38^{\circ}\text{C}$, 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 dates¹

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

27/09/2021 (Week 39 2021) – Rollout of the first COVID-19 booster vaccination

22/04/2022 (Week 16 2022) – Rollout of the second COVID-19 booster vaccination

Week number refers to the week of hospital admission. Weeks run from Monday to Sunday, as per the international ISO week².

¹ Refer to [Health Protection Surveillance Centre \(hpsc.ie\)](https://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, 650 SARI cases were admitted to St. Vincent’s University Hospital (SVUH) during 2022 (weeks 1-49 2022).

In week 49 2022:

- 23 SARI cases were reported in week 49 2022, compared to 13 SARI cases reported in week 48 2022 (Figure 1).
- The SARI incidence rate was 7.6 per 100,000 hospital catchment population aged ≥15 years, compared to the rate of 4.3 per 100,000 in week 48 2022.
- The SARI incidence rate per emergency hospitalisations was 89.8 per 1,000, compared to the rate of 55.1 per 1,000 in week 48 2022.

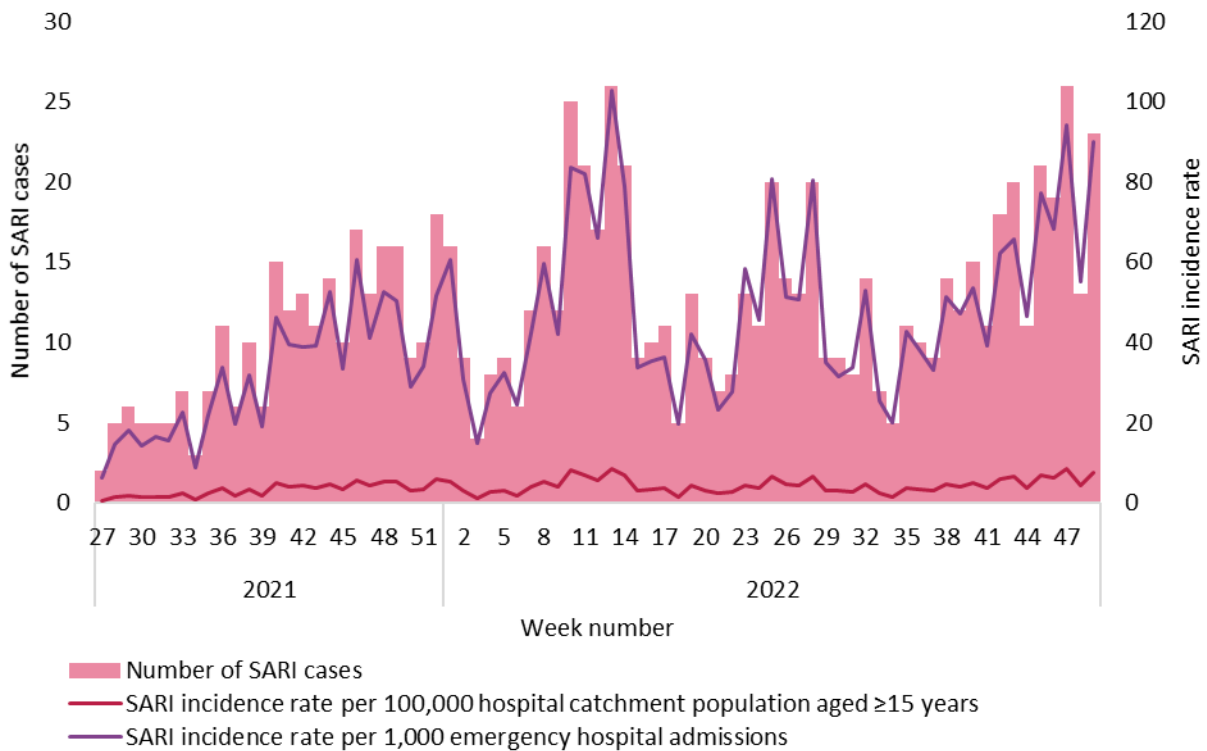


Figure 1 Number and incidence of SARI hospitalised cases (emergency admission) by week of hospital admission, since SARI surveillance began to current week (week 49) 2022 (n=902).

NOTE: Data were extracted from the SARI surveillance database at HPSC on 14/12/2022, 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 49 2022, of the 23 SARI cases reported:

- Males accounted for a higher proportion of SARI cases (n=14, 60.9%) (Table 1)
- The median age of SARI cases admitted was 71 years (interquartile range: 60 - 78 years)
- The incidence rate amongst those aged 65 years and older was 23.4 per 100,000, compared to the rate of 11.7 per 100,000 in week 48 2022.

Table 1 Number and proportion of SARI cases by sex and age, for the current week, weeks 46 to 49, 2022, and for weeks 1-49 2022.

		Week 49, 2022		Weeks 46-49 2022		Weeks 1-49 2022	
		n	%	n	%	n	%
Total number of SARI cases		23		81		650	
Sex	Male	14	60.9	36	44.4	332	51.1
	Female	9	39.1	45	55.6	318	48.9
Age (years)	Mean	67		69		72	
	Median	71		72		75	
	Interquartile range	60 - 78		63 - 80		63 - 83	
	Range	25 - 84		20 - 92		16 - 101	
Age group	15-24 years	0	0.0	2	2.5	15	2.3
	25-34 years	1	4.3	1	1.2	14	2.2
	35-44 years	1	4.3	4	4.9	21	3.2
	45-54 years	1	4.3	3	3.7	39	6.0
	55-64 years	6	26.1	16	19.8	85	13.1
	65-74 years	6	26.1	21	25.9	142	21.8
	75-84 years	8	34.8	25	30.9	200	30.8
85+ years	0	0.0	9	11.1	134	20.6	

*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.

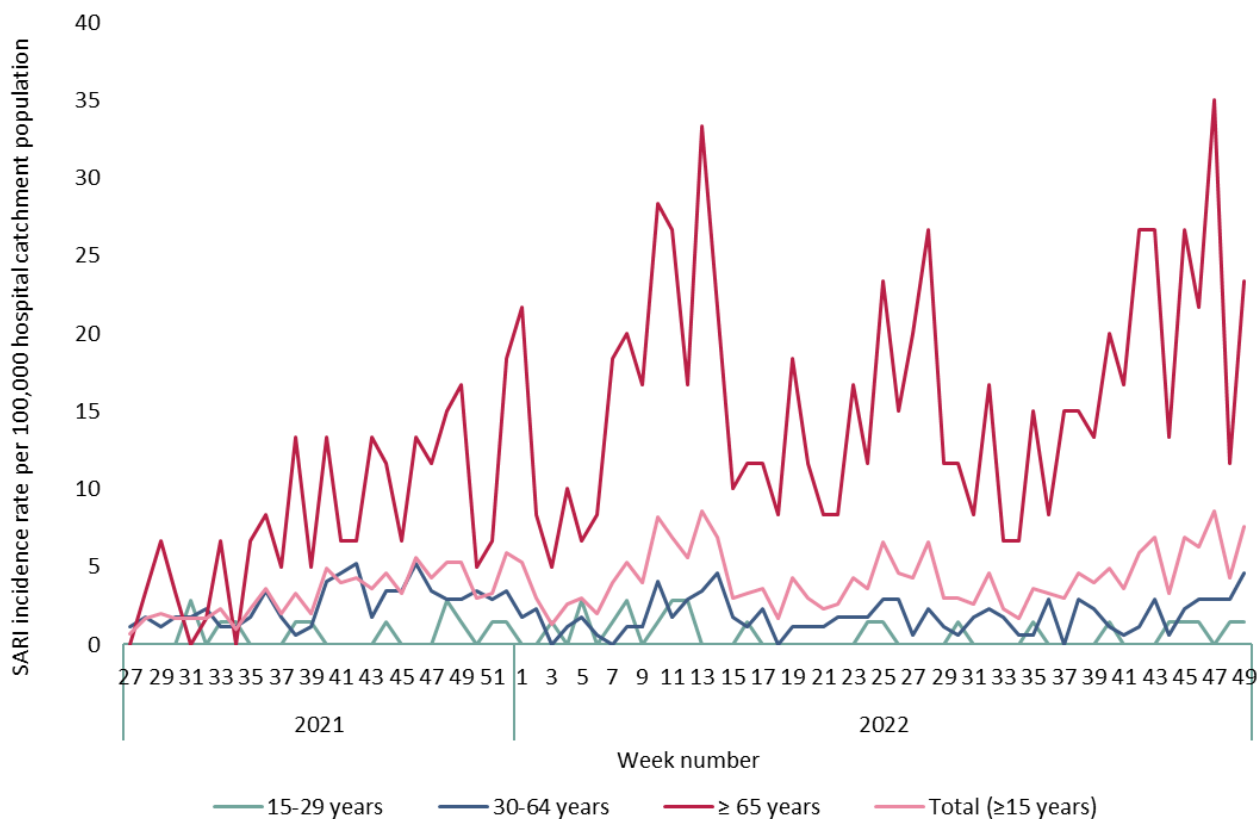


Figure 2 SARI incidence rate per 100,000 hospital catchment population by age group and week of hospital admission, since SARI surveillance began to the current week (week 49) 2022 (n=902)

Underlying medical conditions and risk factors

The number and proportion of individual underlying medical conditions, where known, among those that reported having underlying medical conditions are displayed in table 2.

Weekly proportions can be based on small numbers and can vary from week to week; caution is therefore advised interpreting changes in weekly proportions.

Table 2 Number and proportion of SARI cases with pre-existing conditions, reported on hospital admission, for current week, weeks 46 – 49 and weeks 1-49, 2022.

Underlying medical condition*	Week 49 2022 (n=21)		Weeks 46-49 2022 (n=71)		Weeks 1-49 2022 (n=614)	
	n	%	n	%	n	%
Heart disease	6	28.6	27	38.0	252	41.0
Hypertension	7	33.3	23	32.4	245	39.9
Lung disease	7	33.3	29	40.8	210	34.2
Cancer	5	23.8	14	19.7	131	21.3
Neurological disease	2	9.5	12	16.9	106	17.3
Asthma	1	4.8	14	19.7	93	15.1
Diabetes	4	19.0	10	14.1	102	16.6
Kidney disease	3	14.3	8	11.3	46	7.5
Intellectual disability	3	14.3	4	5.6	29	4.7
Immunocompromised	0	0.0	1	1.4	17	2.8
Obesity	0	0.0	0	0.0	16	2.6
Cystic fibrosis	0	0.0	0	0.0	2	0.3
Other chronic conditions**	10	47.6	37	52.1	296	48.2

*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.

Among female SARI cases aged 15-44 years admitted during weeks 46-49 2022, two (40%) were reported as being pregnant at the time of admission. In total during weeks 1-49 2022, 20.7% (n=6) of female SARI cases aged 15-44 years were reported as being pregnant at the time of admission.

Healthcare workers accounted for 1.3% (n=1) of SARI cases admitted during weeks 46-49 2022. In total during weeks 1-49 2022, 2.4% (n=15) of SARI cases were reported as being healthcare workers.

Symptoms

Information on clinical symptoms, either at or prior to hospital admission, was reported for all SARI cases. The most common symptoms reported 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 current week, weeks 46 to 49 2022, and weeks 1-49 2022.

Clinical symptom*	Week 49 2022 (n= 23)		Weeks 46 - 49 2022 (n= 81)		Weeks 1-49 2022 (n= 650)	
	n	%	n	%	n	%
Cough	17	73.9	66	81.5	505	77.7
Shortness of breath	15	65.2	57	70.4	480	73.8
Fever	13	56.5	33	40.7	299	46.0
General deterioration	10	43.5	38	46.9	270	41.5
Malaise	3	13.0	9	11.1	88	13.5
Headache	3	13.0	6	7.4	37	5.7
Muscular pain	1	4.3	4	4.9	37	5.7
Sore throat	0	0.0	7	8.6	46	7.1
Ageusia	0	0.0	0	0.0	4	0.6
Anosmia	0	0.0	0	0.0	4	0.6
Dysgeusia	0	0.0	0	0.0	3	0.5

*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 and there may be a delay between discharge and data collection, due to the manual data collection methods required.

Among those for whom discharge information is available, the most common complication reported was pneumonia, see table 4 for further information.

Table 4 Number and proportion of discharged SARI cases by complication, for weeks 46-49 2022, and weeks 1-49 2022

Complications*	Weeks 46-49 2022 (n=25)		Weeks 1-49 2022 (n=520)	
	n	%	n	%
Pneumonia	1	4.0	51	9.8
ARDS	0	0.0	44	8.5
Sepsis	0	0.0	11	2.1
Multiorgan failure	0	0.0	1	0.2
Myocarditis	0	0.0	1	0.2
Other complications**	5	20.0	140	26.9
No complications	20	80.0	304	58.5
Unknown	0	0.0	2	0.4

*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.

Information on ICU admission and respiratory support may be available prior to discharge, see table 5, however length of stay in ICU is only available after discharge, therefore, data on ICU length of stay for weeks 46-49 are not included, due to the small numbers involved.

Table 5 Number and proportion of SARI cases by respiratory support and ICU admission, for weeks 46-49 2022, weeks 1-49 2022

		Weeks 46-49 2022 (n=26)		Weeks 1-49 2022 (n=523)	
		n	%	n	%
Respiratory support	High-flow oxygen therapy*	14	53.8	300	57.4
	Invasive ventilation	1	3.8	15	2.9
	No respiratory support given	11	42.3	208	39.8
		(n=33)		(n=548)	
Admitted to ICU	Yes	1	3.0	25	4.6
	No	32	97.0	523	95.4
	Yes, and/or respiratory support	15	45.5	318	58.0
ICU length of stay (days)**	Mean	-	-	21	-
	Median	-	-	10	-
	Interquartile range	-	-	6 - 35	-
	Range	-	-	<1-72	-

*Non-invasive ventilation

**SARI cases which required invasive and/or non-invasive ventilation and/or ICU admission

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

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

PCR testing:

SARI cases are tested by PCR for SARS-CoV-2, influenza and RSV on admission. For a small proportion of cases, there is a lag time with testing for influenza and RSV³.

In week 49 2022:

- SARS-CoV-2 PCR testing was carried out on all SARI cases, three (13.6%) of which were positive, compared to 53.8% (n=7) positivity in week 48 2022 (Figure 3)
- Influenza PCR testing was carried out on 21 (91.3%) SARI cases, six (28.6%) of which were positive for influenza A (not subtyped), compared to one (7.7%) positive for influenza A (not subtyped) in week 48 2022.
- RSV PCR testing was carried out on 21 (91.3%) SARI cases, three (14.3%) of which were positive, compared to 23.1% (n=3) in week 48 2022.

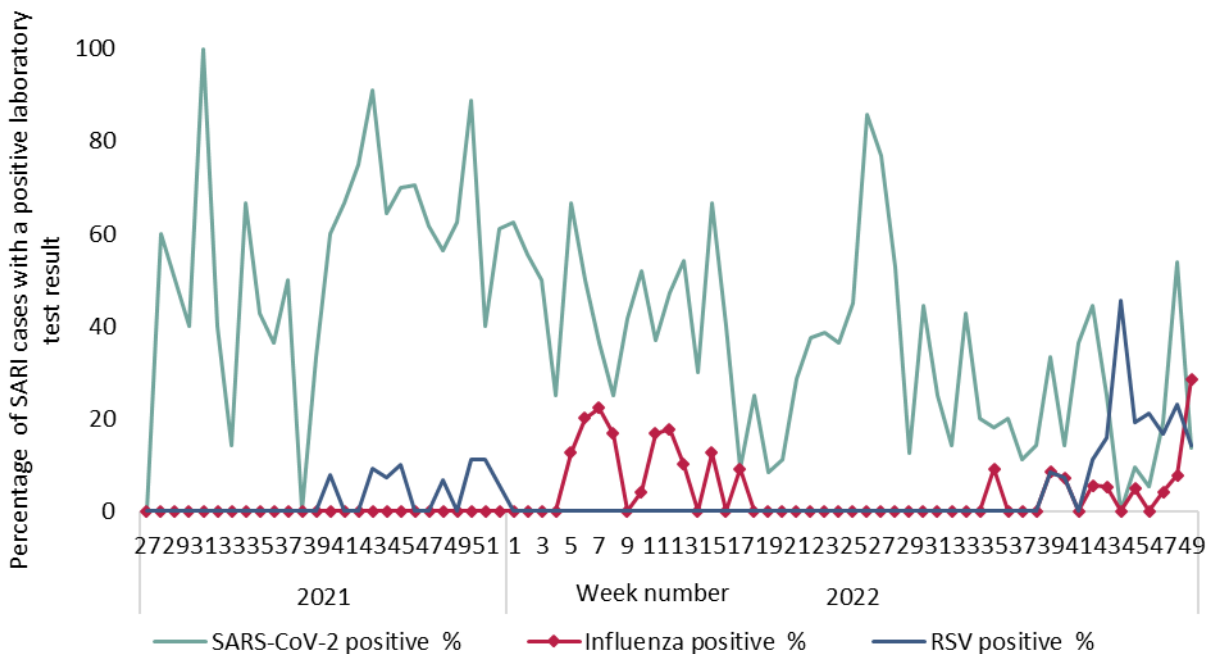


Figure 3 Percentage of SARI cases with a positive laboratory test result for SARS-CoV-2, influenza and RSV by week, since the beginning of SARI surveillance to the current week (week 49, 2022).

SARS CoV-2:

SARS-CoV-2 PCR testing is carried out on admission, table 6 displays the number and proportion of SARI cases tested for SARS-CoV-2 by PCR test result.

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

Table 6 Number and proportion of SARI cases tested for SARS-CoV-2, for current week, weeks 46 to 49, 2022 and weeks 1-49, 2022

Laboratory test	Laboratory test result	Week 49 2022 (n=22)		Weeks 46-49 2022 (n=75)		Weeks 1-49 2022 (n=638)	
		n	%	n	%	n	%
Tested for SARS-CoV-2	Positive	3	13.6	16	20.0	218	34.2
	Negative	18	81.8	62	77.5	391	61.3
	Indeterminate*	1	4.5	2	2.5	29	4.5

* Ct value (cycle threshold) >30

RSV and influenza:

The influenza surveillance season runs from week 40 (early October) to week 20 (end of May) each season. During this time, seasonal influenza viruses and RSV usually circulate at higher levels, compared to the summer period.

Samples that are PCR positive for influenza are sent to the NVRL for influenza typing/subtyping/genetic and antigenic characterisation.

Table 7 displays the influenza type/subtype for all influenza positive samples and RSV PCR test results during the 2022/2023 influenza season (weeks 40-49 2022).

Table 7 Number of positive RSV and influenza SARI cases and influenza type/subtype for current week, preceding week and 2022/2023 season

Positive laboratory result	Week 49 2022 (n=21)		Week 48 2022 (n=13)		2022/2023 season (n=171)	
	n	%	n	%	n	%
RSV	3	14.3	3	23.1	29	17.0
Influenza A (H1)pdm09	0	0	0	0	2	1.2
Influenza A (H3)	0	0	0	0	1	0.6
Influenza A (not subtyped)	6	28.6	1	7.7	8	4.7
Influenza B	0	0	0	0	1	0.6
Total influenza	6	28.6	1	7.7	12	7.0

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 for whole genome sequencing (WGS).

Since SARI surveillance began (week 27 2021) to week 44 2022, all WGS testing was performed in the National Virus Reference Laboratory (NVRL). The molecular lab in SVUH has been identified as a spoke WGS testing site as part of the national SARS-CoV-2 WGS surveillance programme, and from week 45 2022, SARI WGS testing will be performed on-site at SVUH.

In 2022 (weeks 1 to 49), 84.9% (n=185) SARS-CoV-2 positive SARI samples have met the Ct criteria for WGS, of these 9.7% (n=18) were not sequenced, for reasons such as insufficient sample volume, or the sample could not be located, results are pending on 8.6% (n=16), and results have been received for 81.6% (n=151), see figure 4 below.

Omicron has been the dominant variant identified in SARI cases admitted in 2022, 99.3% (n=150) of samples sequenced were identified as Omicron, the last Delta variant was identified in week 1 2022.

ECDC has placed the Omicron sublineages with K444X and N460X spike mutations and BA.4 and BA.5 sublineages with the spike mutation R346X on the list of variants under monitoring (VUMs). There have been eight SARI cases identified with the R346X mutation, admitted between weeks 34 and 47 2022 , and seven cases identified with the K444X/N460X mutation admitted between weeks 39 and 47 2022.

Figure 4 shows sequenced SARI cases by week of hospitalisation and Pango Lineage for cases admitted since SARI surveillance began to the current week, further information on Pango Lineage is available in the appendix (Table A1 and A2).

Further sequencing data on cases admitted since week 47 2022, are still awaited.

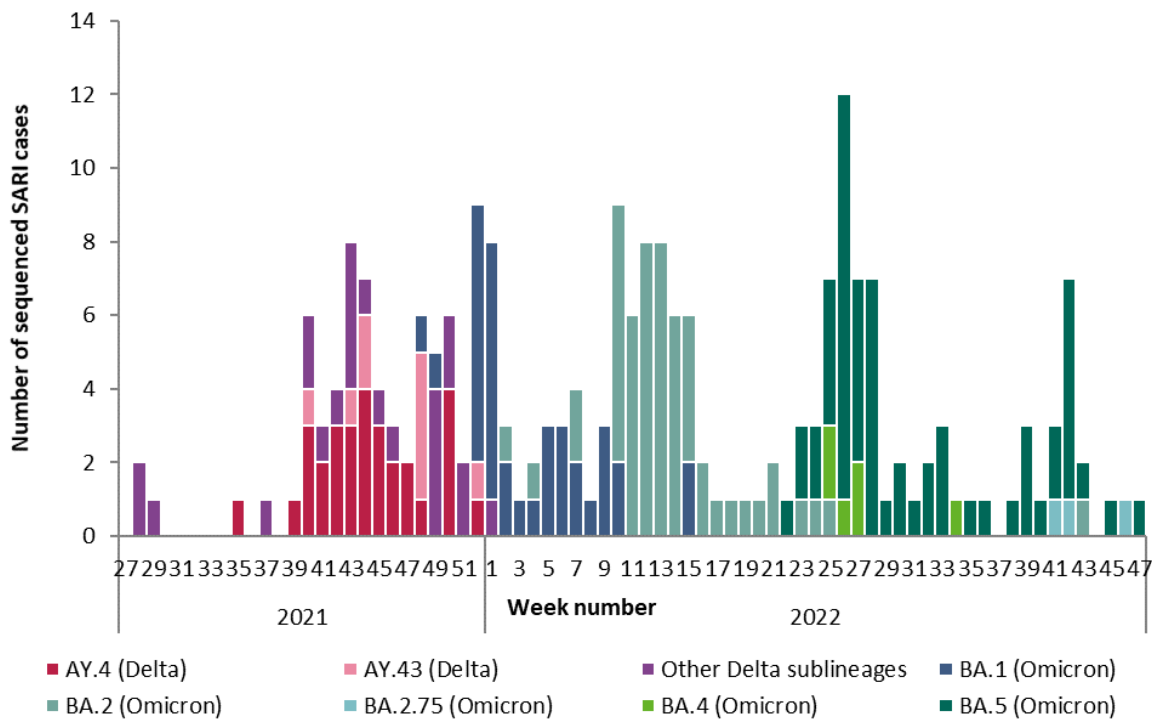


Figure 4 Number of SARI cases sequenced and reported by the National Virus Reference Laboratory, by week of hospitalisation, since SARI surveillance began to the week 47 2022 (n=222)

COVID-19 Vaccination status

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.

Amongst the SARI cases, admitted since the rollout of the second booster (22/04/2022), who tested positive by PCR for SARS-CoV-2 with known COVID-19 vaccination status, 73.9% (n=65) had not received a second booster vaccine dose >7 days prior to the epidemiological date of their episode of illness (Table 8).

Refer to the technical notes for the full list of definitions regarding epidemiological date and COVID-19 vaccination status⁴.

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

Table 8 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* (n=306)		Weeks 1-49 2022 (n=492)	
	Vaccine status	n	%	n
Not vaccinated	9	10.2	19	10.7
Primary series - Partial	0	0.0	1	0.6
Primary series - Complete	8	9.1	28	15.7
First booster	48	54.5	107	60.1
Second booster	23	26.1	23	12.9
Total	88	100	178	100
SARS CoV-2 PCR negative				
Vaccine status	n	%	n	%
Not vaccinated	3	1.4	7	2.2
Primary series - Partial	0	0.0	0	0.0
Primary series - Complete	18	8.3	33	10.5
First booster	115	52.8	192	61.1
Second booster	82	37.6	82	26.1
Total	218	100	314	100

*Rollout of second booster began on 22/04/2022

Table 9 displays the clinical course and outcome of those admitted since the rollout of the second booster (22/04/2022) by SARS CoV-2 PCR result and vaccination status.

Data collection for clinical course and outcome is on-going for those still admitted.

Table 9 Number and proportion of SARI cases, admitted since the rollout of the second booster, by COVID-19 vaccination status, and SARS-CoV-2 PCR result (n=306)

SARS CoV-2 PCR positive			Required respiratory support		ICU admission		Died in hospital	
Vaccination status	n	%	n	%	n	%	n	%
Not vaccinated	9	10.2	3	8.3	0	0.0	0	0.0
Primary series - Partial	0	0.0	0	0.0	0	0.0	0	0.0
Primary series - Complete	8	9.1	3	8.3	0	0.0	0	0.0
First booster	48	54.5	20	52.8	2	66.7	3	75.0
Second booster	23	26.1	11	30.6	1	33.3	1	25.0
Total	88	100	37	100	3	100	4	100
SARS CoV-2 PCR negative								
Vaccination status	n	%	n	%	n	%	n	%
Not vaccinated	3	1.4	3	2.9	0	0.0	1	8.3
Primary series - Partial	0	0.0	0	0.0	0	0.0	0	0.0
Primary series - Complete	18	8.3	7	6.9	0	0.0	1	8.3
First booster	115	53.2	60	58.8	4	80.0	4	33.3
Second booster	82	37.2	35	31.4	1	20.0	7	50.0
Total	218	100	105	100	5	100	13	100

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

Outcome

Of the 650 SARI cases admitted during 2022, 80% (n=520) have been discharged (Table 10). During weeks 46 to 49 2022, 81 SARI cases were admitted to St Vincent's University Hospital, discharge data are available for 30.9% (n=25), collection of discharge data is a manual process, therefore there is a significant lag time between discharge and data collection.

Of the 53 cases admitted during 2022, who died in hospital, 36 (67.9%) were male and 17 (32.1%) were female. The median age was 81 years (interquartile range 75 – 87 years).

Table 10 Number and proportion of discharged SARI cases by outcome and hospital length of stay, for weeks 46 to 49, 2022, and weeks 1-49 2022.

		Weeks 46-49 2022 (n=25)		Weeks 1-49 2022 (n=520)	
		n	%	n	%
Outcome	Discharged alive	24	96.0	457	87.9
	Transferred to another hospital	0	0.0	10	1.9
	Died in hospital	1	4.0	53	10.2
Hospital length of stay (days)	Mean	5		11	
	Median	4		6	
	Interquartile range	3 - 6		3 - 12	
	Range	1 - 13		1 - 136	

Acknowledgements

Sincere thanks are extended to all those who participate in SARI surveillance, including those in St. Vincent's University Hospital, the UCD Clinical Research Centre and the National Virus Reference Laboratory. Thanks to members of the HSE Integrated Information Services (IIS) for work on the SARI-COVAX data linkages.

Thanks also to Melissa Brady and Naomi Petty-Saphon, HPSC, for work on establishing the SARI surveillance pilot project.

This report was produced by the SARI surveillance team at HPSC: Róisín Duffy, Adele McKenna, Lisa Domegan, Joan O'Donnell.

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 Pango lineage, SARI cases week 27 2021 to week 47, 2022, (n=222)

Virus variant	Number of cases	% sequenced cases
Total sequenced	222	
Delta and Delta sublineages:	63	28.4
AY.4	30	13.5
AY.43	9	4.1
B.1.617.2	5	2.3
AY.122	4	1.8
AY.5	4	1.8
AY.4.5	2	0.9
AY.4.6	2	0.9
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	0.9

Virus variant	Number of cases	% sequenced cases
Total sequenced	222	
Omicron sublineages	159	71.6
BA.1 lineages:		
BA.1	22	9.9
BA.1.1	14	6.3
BA.2 lineages:		
BA.2	41	18.5
BA.2.9	6	2.7
BA.2.3	5	2.3
BA.2.1	1	0.5
BA.2.18	1	0.5
BA.2.40.1	1	0.5
BA.2.75 lineages		
BN.1.2	1	0.5
BN.1.9	1	0.5
CV.1	1	0.5
BA.4 lineages:		
BA.4	3	1.4
BA.4.1	1	0.5
BA.4.4	1	0.5
BA.4.6	1	0.5
BA.5 lineages:		
BA.5.1	19	8.6
BA.5.2	8	3.6
BA.5.2.1	8	3.6
BA.5	5	2.3
BE.1	4	1.8
BA.5.2.6	2	0.9
BF.7	3	1.4
BQ.1.8	2	0.9

BA.5.3	1	0.5
BE.1.1	1	0.5
BE.1.1.2	1	0.5
BF.1	1	0.5
BF.11.1	1	0.5
BQ.1	1	0.5
BQ.1.1.5	1	0.5
BQ.1.2	1	0.5

Table A2

Number of SARI cases sequenced and reported by Pango lineage and week of admission, SARI cases weeks 43 2021 to week 47, 2022

Virus variant	Pango lineage	2022 W47	2022 W46	2022 W45	2022 W44	2022 W43	Total
Omicron, BA.5	BA.5.2.6			1*			1
	BF.7	1*					1
	BQ.1.2					1†	1
Omicron, BA.2	BA.2					1	1
Omicron, BA.2.75	BN.1.9		1†				1
Total		1	1	1	0	2	5

*BA.4/BA.5 + R346X mutation

†K444X/N460X mutations