MONASH University

SPRINT SARI

SHORT PERIOD INCIDENCE STUDY OF SEVERE ACUTE RESPIRATORY INFECTION (SPRINT-SARI)

SPRINT SARI Annual Report

2024

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About this report

This report is divided into:
- Table of contents
- Executive summary
- Totals for 2024
- Adult summary
- Paediatric summary
- Conclusions

SPRINT-SARI AUS 2024 Annual Report on COVID-19 and non-COVID SARI Admissions to Intensive Care Units in Australia

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TABLE OF CONTENTS

EXECUTIVE SUMMARY 2024

SPRINT-SARI Australia is a national, multi-centre registry of critically ill Severe Acute Respiratory Infection (SARI) patients admitted to Intensive Care Units (ICUs).

From **January 1st to 31 December 2024**, the SPRINT-SARI AUS database collected data on **4,377 ICU patients** from **53 sites** across all six Australian states and two territories, including **1,397 Polymerase Chain Reaction (PCR) or Rapid Antigen Tests (RAT) confirmed COVID-19 cases**. Compared to the last few years, cases of admission with severe COVID-19 have reduced, while the incidence of influenza has increased.

To date, there are over **16,212** patients (**13,041** Adult; **3,167** Paediatric)* in the SPRINT-SARI database and this data.
*4 patients have no date of birth recorded

Key points to highlight in 2024 included:

- This included **2,726** adults and **1,649** paediatric cases
- **1,397** COVID-19 cases, which was the least number of cases since 2020
- **863** influenza cases, which has increased since 2023
- **530** RSV cases, which was the main cause of admission in paediatric cases
- **1,585** cases other than COVID-19, influenza or Respiratory syncytial virus (RSV), which has remained stable

SPRINT SARI has provided 12 monthly reports to the Commonwealth National Respiratory Infections Surveillance Committee (NRISC) group, reports to state governments, 74 sites, and produced 22 publications.

Background and Methods

SPRINT-SARI International is a global collaboration designed to characterise patients with Severe Acute Respiratory Infection (SARI), inform clinical management, and strengthen health system readiness for emerging outbreaks. SPRINT-SARI Australia is a national, multi-centre registry of critically ill SARI patients admitted to Intensive Care Units (ICUs). It was rapidly mobilised in March 2020 by the Australian and New Zealand Intensive Care Society Clinical Trials Group (ANZICS-CTG), the Australian and New Zealand Intensive Care Research Centre (ANZIC-RC), and Monash University to capture real-time data on patients with Coronavirus Disease 2019 (COVID-19), supporting both frontline clinical care and the national public health response.

Scope and Evolution:

- 2020 (March–June): Adults with confirmed or suspected COVID-19 (PCR/RAT).

- From July 2020: Only confirmed COVID-19 cases.
- From June 2022: Expanded to non-COVID viral SARI (Influenza A/B, Parainfluenza, RSV, and other respiratory viruses).
- Paediatric cases now included.

Methods & Data Collection:

Data are entered by trained ICU research coordinators into a secure REDCap database hosted by Monash University. The Case Report Form (CRF), aligned with international standards, captures demographics, pathogen testing, treatments (IMV, ECMO, RRT, prone positioning), and outcomes. In 2022, the CRF was streamlined to a minimum dataset (version 4.5) to reduce site workload while maintaining essential surveillance capability.

Impact since 2020:

- Over **16,212** patients (**13,041** Adult; **3,167** Paediatric)*
  *4 patients have no date of birth recorded
- Monthly contributions to the Australian Respiratory Surveillance Reports.
- Informed Australia's COVID-19 preparedness and response strategies.
- Supported more than **22 peer-reviewed publications**.

Key Considerations:

- Data reflect only ICU-managed SARI cases, not all infections.
- Some records are incomplete; transfers aggregated where possible.
- Analyses are descriptive; causal interpretations should be made cautiously.

Acknowledgements:

The success of SPRINT-SARI relies on the dedication of ICU research coordinators and clinicians across Australia, and the leadership of the SPRINT-SARI Management Committee, particularly during the most challenging phases of the COVID-19 pandemic.

Summary

During the year of 2024, a total of **76 ICU sites** were participating in the SPRINT-SARI COVID-19 database, and **53 ICU sites** contributed data. A total of **4,377 ICU COVID-19 admissions** were reported to SPRINT-SARI in the period. Considering PCR-positive and RAT-positive patients, **1,397 COVID-19** admissions were reported to SPRINT-SARI.

Table 1 provides a breakdown by State and Territory.

Table 1. Overview by State/Territory – Participation and Admissions

	Number of ICU Sites		Number of ICU Admissions		
State / Territory	Participating	Contributing Data	Confirmed COVID-19	Non-COVID SARI	Paediatric patient
NSW	17	10	278	699	438
VIC	25	18	520	831	408
QLD	15	12	204	662	533
WA	9	5	92	373	252
SA	5	4	217	254	3
TAS	2	2	27	21	0
NT	2	1	31	80	10
ACT	1	1	28	60	5
Total	**76**	**53**	**1397**	**2980**	**1649**

Notes: *ICU admissions with strong clinical suspicion of COVID-19 (with negative swab or awaiting swab) are managed as COVID-19.

Number of ICU admissions

The daily number of ICU beds occupied by COVID-19 patients are shown in **Figure 1** and a State/Territory breakdown of admissions is presented in **Figure 2**.

Figure 1. Daily number of ICU beds occupied by patients with confirmed or strong clinical suspicion of COVID-19

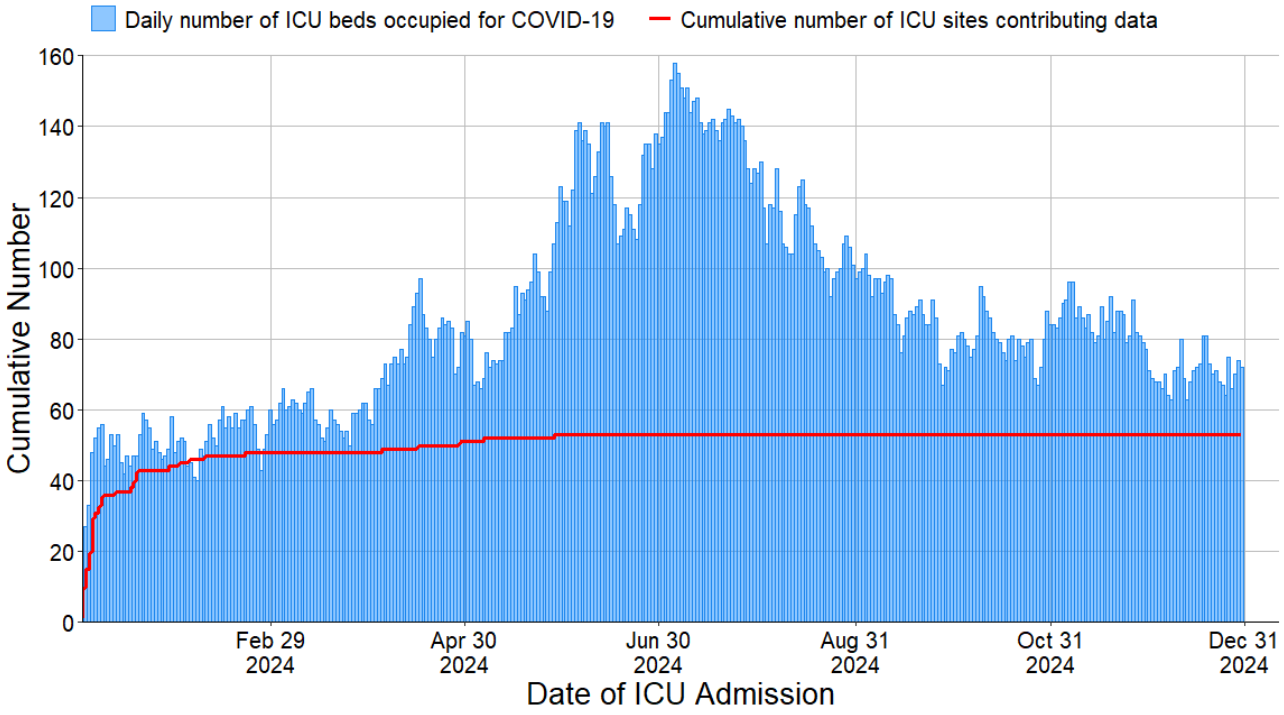
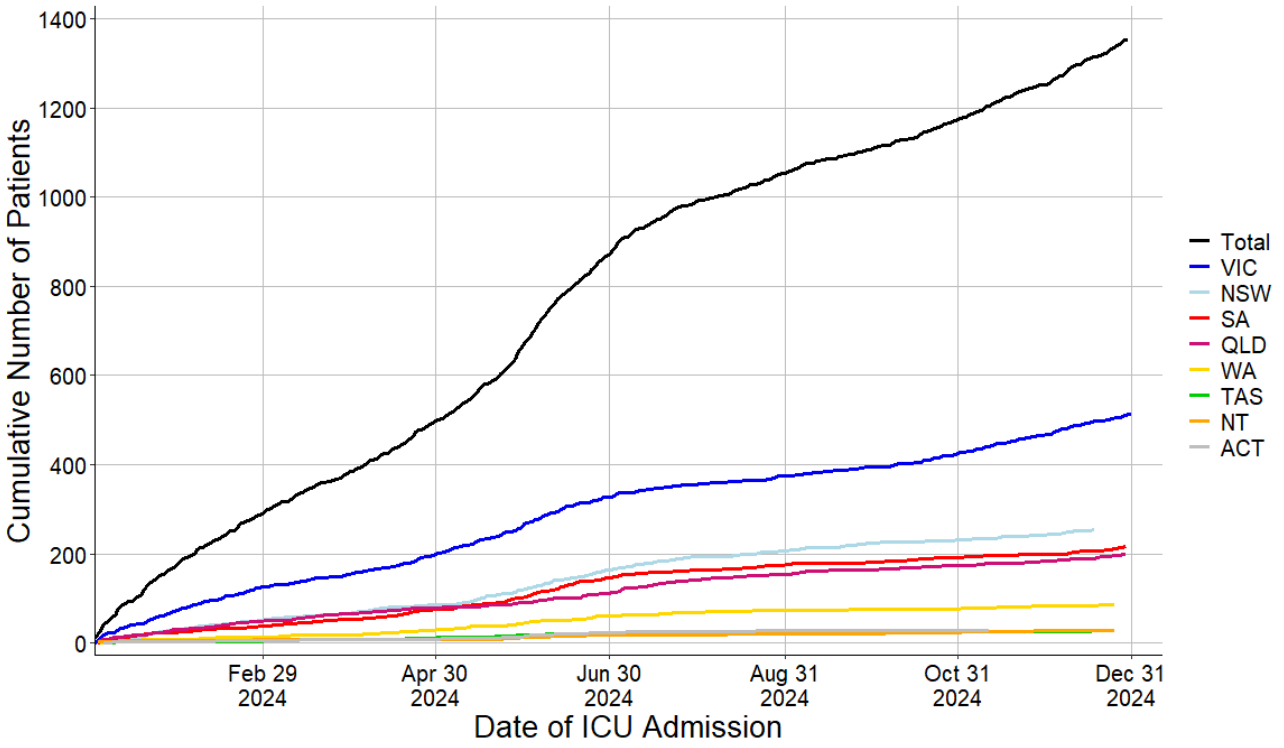


Figure 2. Cumulative number of ICU admissions with confirmed or strong clinical suspicion of COVID-19 by State and Territory



Demographics

Patient characteristics of ICU admissions are provided in **Table 2** and **Figures 3 to 5**.

Table 2. Characteristics of patients admitted to ICU

	2024			pre-2024			Overall		
	COVID SARI N = 1,397[1]	**non-COVID SARI** N = 2,980[1]	**Overall** N = 4,377[1]	**COVID SARI** N = 10,163[1]	**non-COVID SARI** N = 1,672[1]	**Overall** N = 11,835[1]	**COVID SARI** N = 11,560[1]	**non-COVID SARI** N = 4,652[1]	**Overall** N = 16,212[1]
Age	57.0 (24.6)	31.3 (28.4)	39.5 (29.8)	57.3 (20.3)	25.7 (27.1)	52.9 (24.0)	57.3 (20.8)	29.3 (28.1)	49.3 (26.4)
Age group									
0-9 years	124 (8.9%)	1,123 (37.7%)	1,247 (28.5%)	321 (3.2%)	775 (46.4%)	1,096 (9.3%)	445 (3.8%)	1,898 (40.8%)	2,343 (14.5%)
10-19 years	68 (4.9%)	377 (12.7%)	445 (10.2%)	285 (2.8%)	233 (13.9%)	518 (4.4%)	353 (3.1%)	610 (13.1%)	963 (5.9%)
20-29 years	48 (3.4%)	145 (4.9%)	193 (4.4%)	524 (5.2%)	59 (3.5%)	583 (4.9%)	572 (4.9%)	204 (4.4%)	776 (4.8%)
30-39 years	54 (3.9%)	127 (4.3%)	181 (4.1%)	835 (8.2%)	76 (4.5%)	911 (7.7%)	889 (7.7%)	203 (4.4%)	1,092 (6.7%)
40-49 years	77 (5.5%)	196 (6.6%)	273 (6.2%)	1,046 (10.3%)	101 (6.0%)	1,147 (9.7%)	1,123 (9.7%)	297 (6.4%)	1,420 (8.8%)
50-59 years	175 (12.5%)	276 (9.3%)	451 (10.3%)	1,683 (16.6%)	117 (7.0%)	1,800 (15.2%)	1,858 (16.1%)	393 (8.5%)	2,251 (13.9%)
60-69 years	317 (22.7%)	345 (11.6%)	662 (15.1%)	2,169 (21.3%)	137 (8.2%)	2,306 (19.5%)	2,486 (21.5%)	482 (10.4%)	2,968 (18.3%)
70-79 years	348 (24.9%)	270 (9.1%)	618 (14.1%)	2,242 (22.1%)	120 (7.2%)	2,362 (20.0%)	2,590 (22.4%)	390 (8.4%)	2,980 (18.4%)
80-89 years	166 (11.9%)	108 (3.6%)	274 (6.3%)	978 (9.6%)	50 (3.0%)	1,028 (8.7%)	1,144 (9.9%)	158 (3.4%)	1,302 (8.0%)
≥ 90 years	20 (1.4%)	11 (0.4%)	31 (0.7%)	79 (0.8%)	3 (0.2%)	82 (0.7%)	99 (0.9%)	14 (0.3%)	113 (0.7%)
Sex									
Male	806 (57.7%)	1,575 (52.9%)	2,381 (54.4%)	6,181 (60.9%)	913 (54.6%)	7,094 (60.0%)	6,987 (60.5%)	2,488 (53.5%)	9,475 (58.5%)
Female	591 (42.3%)	1,402 (47.1%)	1,993 (45.6%)	3,975 (39.1%)	759 (45.4%)	4,734 (40.0%)	4,566 (39.5%)	2,161 (46.5%)	6,727 (41.5%)
Received COVID-19 vaccine	766 (81.9%)	-	766 (81.9%)	5,159 (63.0%)	0 (0.0%)	5,159 (62.9%)	5,925 (64.9%)	0 (0.0%)	5,925 (64.9%)
Number of vaccinations									
1	12 (1.6%)	-	12 (1.6%)	569 (11.1%)	-	569 (11.1%)	581 (9.9%)	-	581 (9.9%)
2	135 (18.0%)	-	135 (18.0%)	1,796 (35.1%)	-	1,796 (35.1%)	1,931 (32.9%)	-	1,931 (32.9%)
3	231 (30.8%)	-	231 (30.8%)	1,675 (32.7%)	-	1,675 (32.7%)	1,906 (32.5%)	-	1,906 (32.5%)
4	160 (21.3%)	-	160 (21.3%)	897 (17.5%)	-	897 (17.5%)	1,057 (18.0%)	-	1,057 (18.0%)
5	141 (18.8%)	-	141 (18.8%)	169 (3.3%)	-	169 (3.3%)	310 (5.3%)	-	310 (5.3%)
6	72 (9.6%)	-	72 (9.6%)	13 (0.3%)	-	13 (0.3%)	85 (1.4%)	-	85 (1.4%)

	2024			pre-2024			Overall		
	COVID SARI N = 1,397[1]	**non-COVID SARI** N = 2,980[1]	**Overall** N = 4,377[1]	**COVID SARI** N = 10,163[1]	**non-COVID SARI** N = 1,672[1]	**Overall** N = 11,835[1]	**COVID SARI** N = 11,560[1]	**non-COVID SARI** N = 4,652[1]	**Overall** N = 16,212[1]
Pregnant									
Yes	5 (0.9%)	16 (1.4%)	21 (1.2%)	153 (3.9%)	4 (0.5%)	157 (3.4%)	158 (3.6%)	20 (1.1%)	178 (2.8%)
No	466 (83.1%)	781 (67.2%)	1,247 (72.3%)	3,098 (79.9%)	360 (48.9%)	3,458 (74.9%)	3,564 (80.3%)	1,141 (60.1%)	4,705 (74.2%)
Unknown	24 (4.3%)	88 (7.6%)	112 (6.5%)	161 (4.2%)	22 (3.0%)	183 (4.0%)	185 (4.2%)	110 (5.8%)	295 (4.7%)
N/A	66 (11.8%)	278 (23.9%)	344 (20.0%)	467 (12.0%)	350 (47.6%)	817 (17.7%)	533 (12.0%)	628 (33.1%)	1,161 (18.3%)
Indigenous	70 (5.0%)	269 (9.0%)	339 (7.7%)	387 (3.8%)	136 (8.1%)	523 (4.4%)	457 (4.0%)	405 (8.7%)	862 (5.3%)
BMI‡	28.1 (7.5)	26.2 (8.8)	26.9 (8.4)	29.9 (7.8)	26.3 (8.9)	29.6 (8.0)	29.7 (7.8)	26.2 (8.8)	28.9 (8.2)
BMI category									
Underweight	77 (5.7%)	364 (12.9%)	441 (10.6%)	239 (2.4%)	129 (8.1%)	368 (3.2%)	316 (2.8%)	493 (11.2%)	809 (5.1%)
Normal weight	253 (18.6%)	415 (14.7%)	668 (16.0%)	1,399 (13.9%)	141 (8.9%)	1,540 (13.2%)	1,652 (14.5%)	556 (12.6%)	2,208 (14.0%)
Overweight	265 (19.5%)	381 (13.5%)	646 (15.5%)	1,995 (19.9%)	135 (8.5%)	2,130 (18.3%)	2,260 (19.8%)	516 (11.7%)	2,776 (17.6%)
Obese - Class I	180 (13.2%)	206 (7.3%)	386 (9.2%)	1,377 (13.7%)	70 (4.4%)	1,447 (12.4%)	1,557 (13.7%)	276 (6.3%)	1,833 (11.6%)
Obese - Class II	96 (7.1%)	112 (4.0%)	208 (5.0%)	769 (7.7%)	42 (2.6%)	811 (7.0%)	865 (7.6%)	154 (3.5%)	1,019 (6.4%)
Obese - Class III	74 (5.4%)	141 (5.0%)	215 (5.1%)	756 (7.5%)	53 (3.3%)	809 (7.0%)	830 (7.3%)	194 (4.4%)	1,024 (6.5%)
Not stated	414 (30.5%)	1,197 (42.5%)	1,611 (38.6%)	3,503 (34.9%)	1,023 (64.2%)	4,526 (38.9%)	3,917 (34.4%)	2,220 (50.4%)	6,137 (38.8%)
Steroids	985 (71.1%)	1,580 (53.4%)	2,565 (59.0%)	7,072 (76.7%)	850 (52.1%)	7,922 (73.0%)	8,057 (75.9%)	2,430 (53.0%)	10,487 (69.0%)
Tocilizumab	50 (3.6%)	4 (0.1%)	54 (1.2%)	638 (6.3%)	0 (0.0%)	638 (5.4%)	688 (6.0%)	4 (0.1%)	692 (4.3%)
Neutralizing antibodies	2 (0.1%)	0 (0.0%)	2 (0.0%)	174 (1.7%)	0 (0.0%)	174 (1.5%)	176 (1.5%)	0 (0.0%)	176 (1.1%)
Remdesivir	794 (56.8%)	2 (0.1%)	796 (18.2%)	3,931 (38.7%)	1 (0.1%)	3,932 (33.2%)	4,725 (40.9%)	3 (0.1%)	4,728 (29.2%)
Invasive ventilation*	470 (33.7%)	975 (32.8%)	1,445 (33.1%)	3,489 (36.6%)	497 (29.8%)	3,986 (35.6%)	3,959 (36.2%)	1,472 (31.7%)	5,431 (34.9%)
Prone positioning†	43 (3.1%)	103 (3.5%)	146 (3.3%)	697 (13.6%)	96 (5.8%)	793 (11.7%)	740 (11.3%)	199 (4.3%)	939 (8.4%)
ECMO	11 (0.8%)	46 (1.5%)	57 (1.3%)	142 (1.5%)	44 (2.6%)	186 (1.7%)	153 (1.4%)	90 (1.9%)	243 (1.6%)
Dialysis	119 (8.5%)	180 (6.0%)	299 (6.8%)	462 (9.0%)	100 (6.0%)	562 (8.3%)	581 (8.9%)	280 (6.0%)	861 (7.7%)
Antibiotic therapy	1,181 (85.1%)	2,635 (89.1%)	3,816 (87.8%)	4,684 (81.6%)	1,440 (88.2%)	6,124 (83.1%)	5,865 (82.3%)	4,075 (88.8%)	9,940 (84.9%)

[1]Mean (SD); n (%)
*Mean and SD were based on at least one episode of mechanical ventilation
†Defined as at least one observation of prone positioning while not receiving invasive ventilation
‡BMI values < 15 or > 60 were excluded from the BMI analysis

Figure 3. Outcome of ICU admission

Age and sex distribution

The outcome of ICU admission for SARI, grouped by sex and age range are presented below.

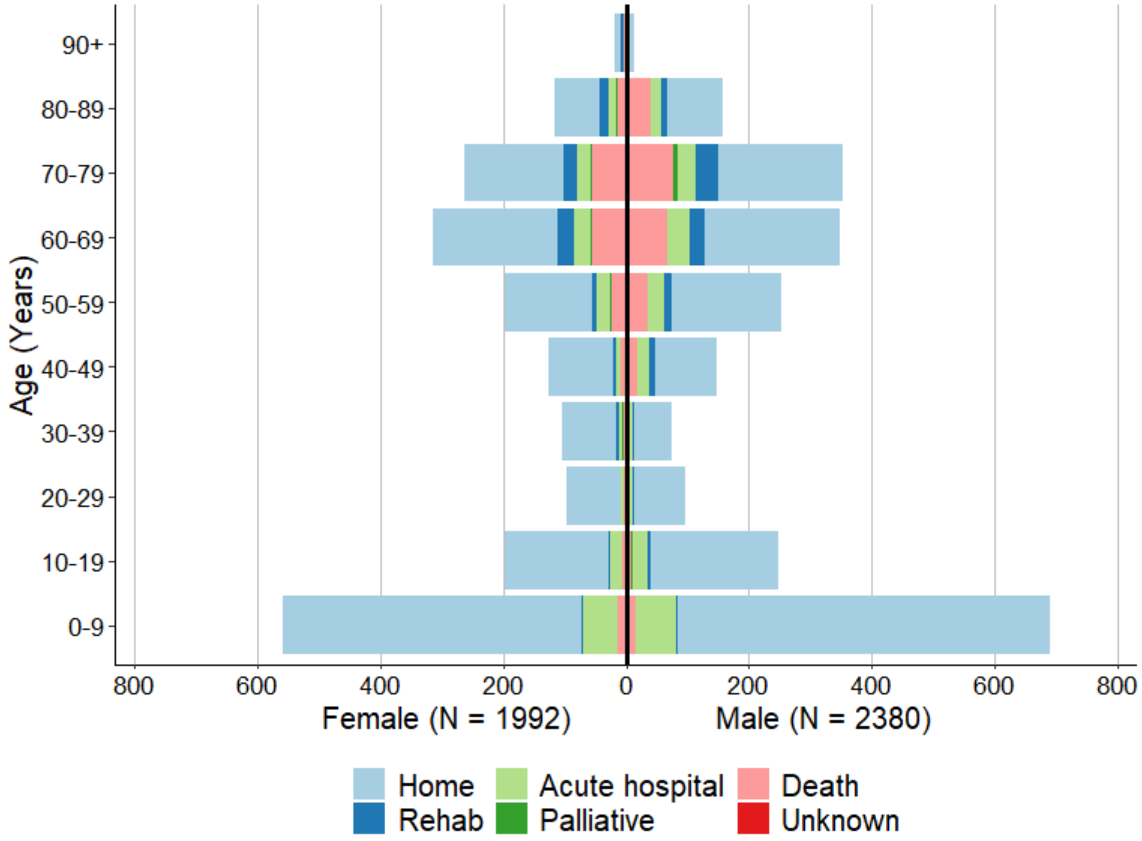


Figure 4. Age range and mortality distribution

Figure 4 presents the average percent mortality over the past 5 years (2020 to 2024), grouped by age range.

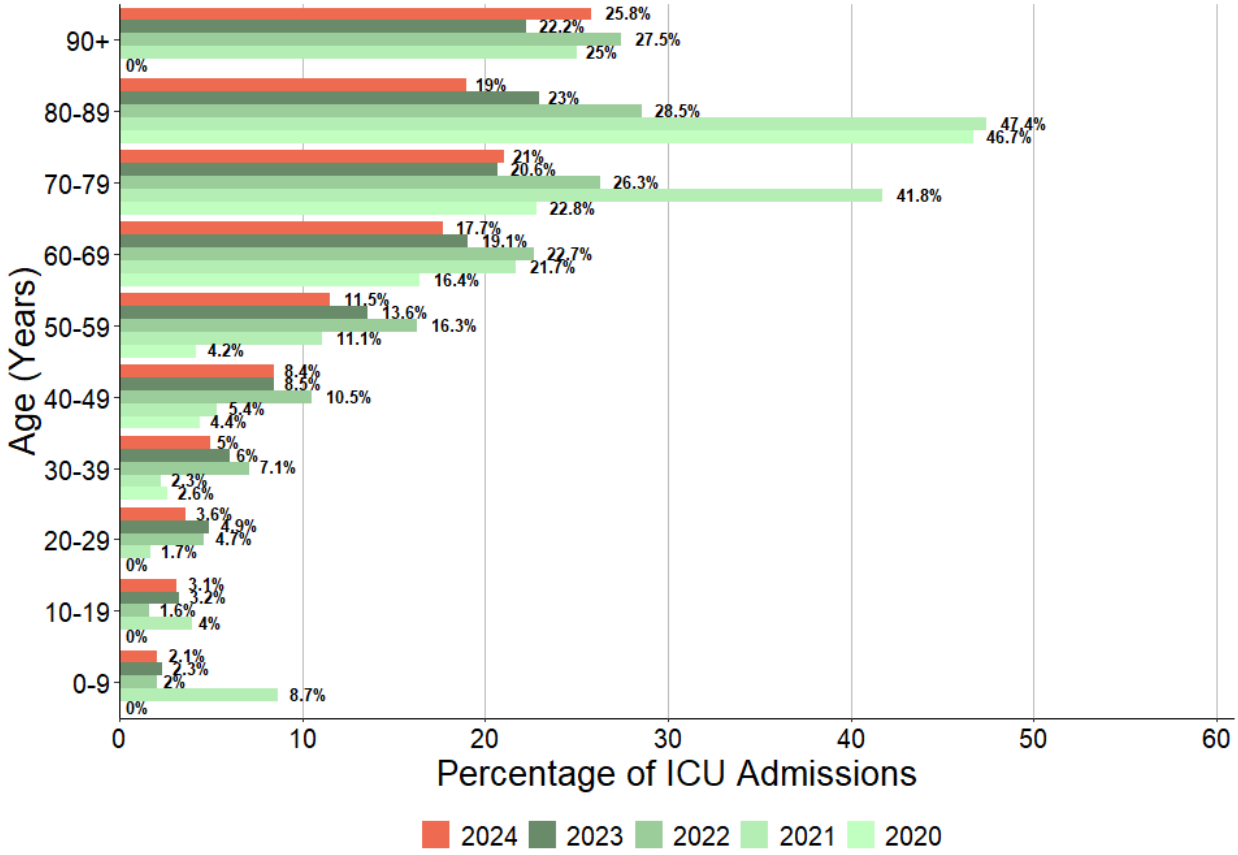
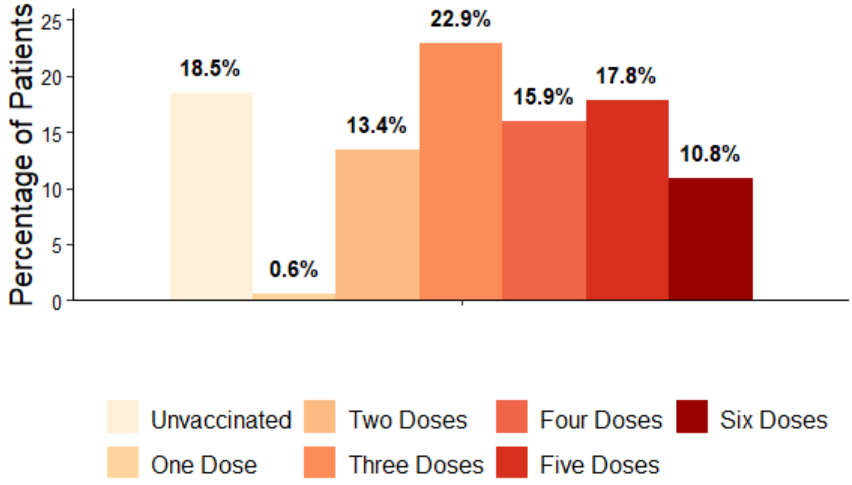


Figure 5. Hospital mortality according to vaccination status



Among patients who died, the percentage in each vaccination category is described in the graph.

Adult population

Analysis of Adult population (15 years and older)

Number of ICU admissions

The daily number of ICU beds occupied by Adult COVID-19 patients are shown in Figure 6 and a State/Territory breakdown of admissions is presented in Figure 7.

Figure 6. Daily number of ICU beds occupied by patients with confirmed or strong clinical suspicion of COVID-19

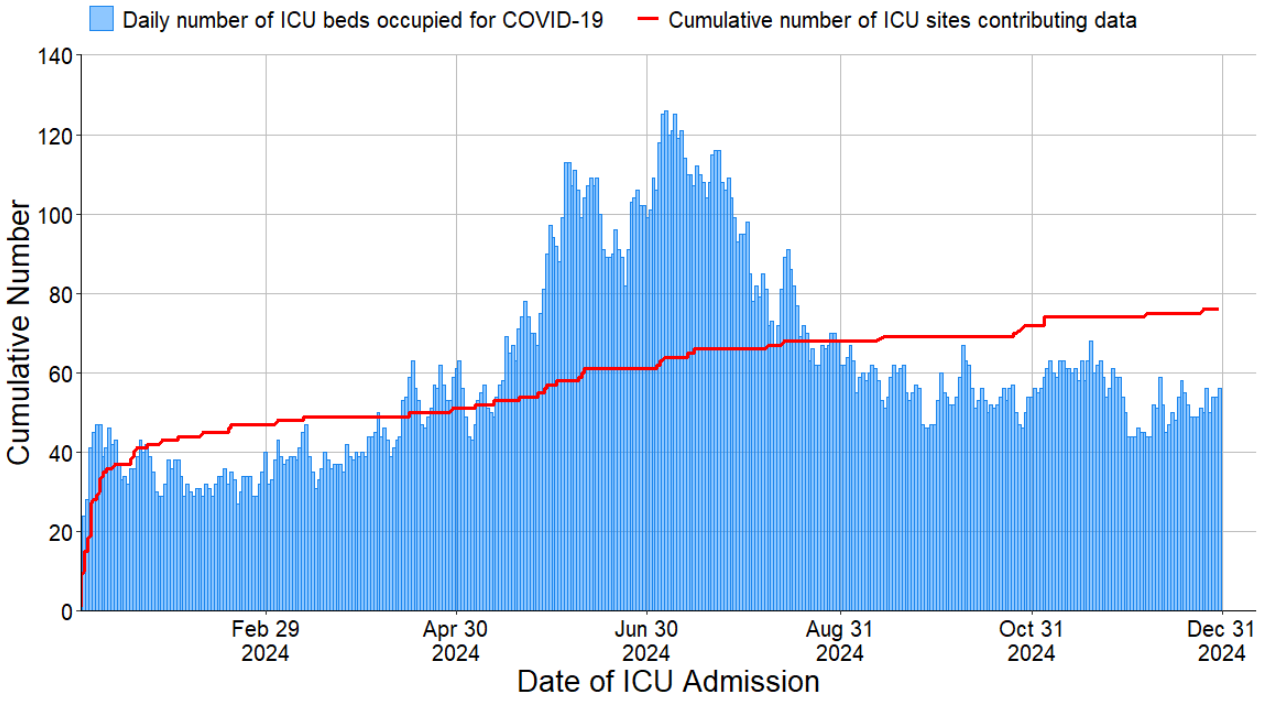
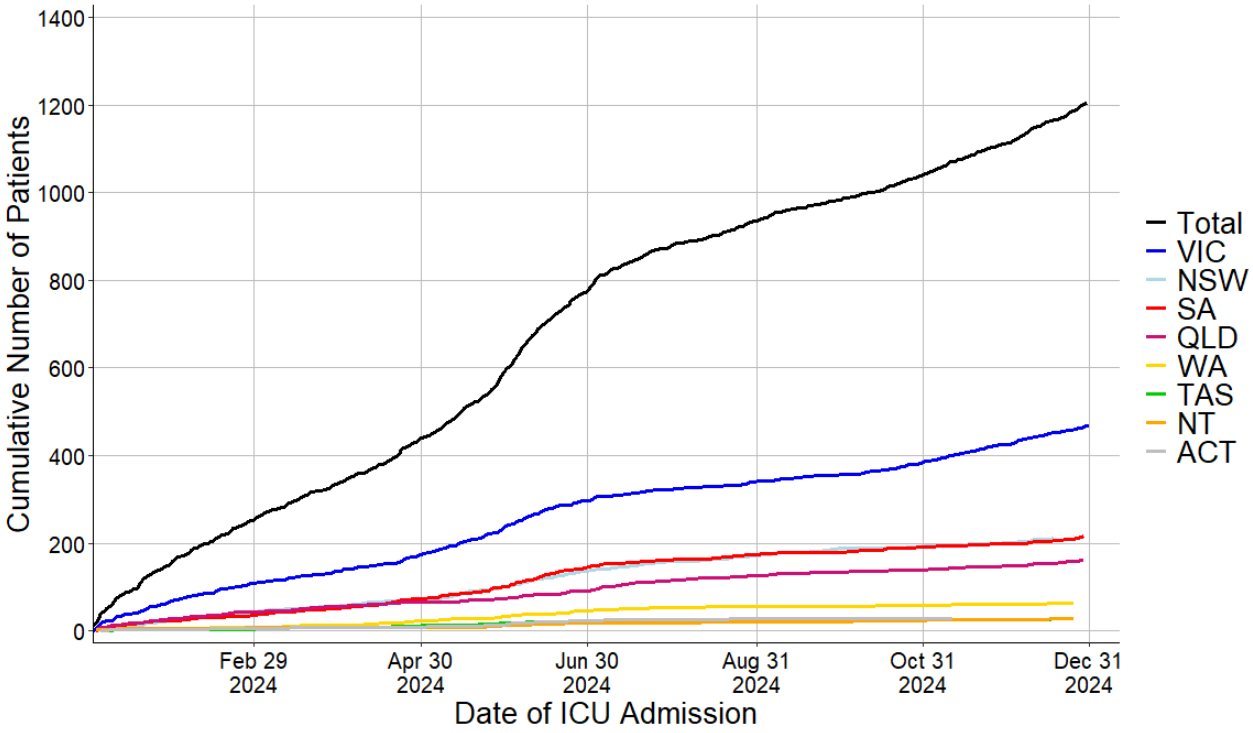


Figure 7. Cumulative number of ICU admissions with confirmed or strong clinical suspicion of COVID-19 by State and Territory



Demographics

Patient characteristics of Adult ICU admissions are provided in **Table 3** and **Figures 8** to **10**.

Table 3. Characteristics of Adult patients admitted to ICU

	2024			pre-2024			Overall		
	COVID SARI N = 1,397[1]	**non-COVID SARI** N = 2,980[1]	**Overall** N = 4,377[1]	**COVID SARI** N = 10,163[1]	**non-COVID SARI** N = 1,672[1]	**Overall** N = 11,835[1]	**COVID SARI** N = 11,560[1]	**non-COVID SARI** N = 4,652[1]	**Overall** N = 16,212[1]
Age	57.0 (24.6)	31.3 (28.4)	39.5 (29.8)	57.3 (20.3)	25.7 (27.1)	52.9 (24.0)	57.3 (20.8)	29.3 (28.1)	49.3 (26.4)
Age group									
15-19 years	68 (5.4)	377 (20.4)	445 (14.4)	285 (2.9)	233 (26.1)	518 (4.9)	353 (3.2)	610 (22.3)	963 (7.0)
20-29 years	48 (3.8)	145 (7.9)	193 (6.2)	524 (5.4)	59 (6.6)	583 (5.5)	572 (5.2)	204 (7.5)	776 (5.6)
30-39 years	54 (4.3)	127 (6.9)	181 (5.8)	835 (8.6)	76 (8.5)	911 (8.5)	889 (8.1)	203 (7.4)	1,092 (7.9)
40-49 years	77 (6.1)	196 (10.6)	273 (8.8)	1,046 (10.7)	101 (11.3)	1,147 (10.8)	1,123 (10.2)	297 (10.9)	1,420 (10.3)
50-59 years	175 (14.0)	276 (15.0)	451 (14.6)	1,683 (17.2)	117 (13.1)	1,800 (16.9)	1,858 (16.9)	393 (14.4)	2,251 (16.4)
60-69 years	317 (25.3)	345 (18.7)	662 (21.4)	2,169 (22.2)	137 (15.3)	2,306 (21.6)	2,486 (22.6)	482 (17.6)	2,968 (21.6)
70-79 years	348 (27.8)	270 (14.6)	618 (20.0)	2,242 (23.0)	120 (13.4)	2,362 (22.2)	2,590 (23.5)	390 (14.2)	2,980 (21.7)
80-89 years	166 (13.2)	108 (5.9)	274 (8.8)	978 (10.0)	50 (5.6)	1,028 (9.6)	1,144 (10.4)	158 (5.8)	1,302 (9.5)
Sex									
Male	806 (57.7)	1,575 (52.9)	2,381 (54.4)	6,181 (60.9)	913 (54.6)	7,094 (60.0)	6,987 (60.5)	2,488 (53.5)	9,475 (58.5)
Female	591 (42.3)	1,402 (47.1)	1,993 (45.6)	3,975 (39.1)	759 (45.4)	4,734 (40.0)	4,566 (39.5)	2,161 (46.5)	6,727 (41.5)
Received COVID-19 vaccine	766 (81.9)	-	766 (81.9)	5,159 (63.0)	-	5,159 (62.9)	5,925 (64.9)	-	5,925 (64.9)
Number of vaccinations									
1	12 (1.6)	-	12 (1.6)	569 (11.1)	-	569 (11.1)	581 (9.9)	-	581 (9.9)
2	135 (18.0)	-	135 (18.0)	1,796 (35.1)	-	1,796 (35.1)	1,931 (32.9)	-	1,931 (32.9)
3	231 (30.8)	-	231 (30.8)	1,675 (32.7)	-	1,675 (32.7)	1,906 (32.5)	-	1,906 (32.5)
4	160 (21.3)	-	160 (21.3)	897 (17.5)	-	897 (17.5)	1,057 (18.0)	-	1,057 (18.0)
5	141 (18.8)	-	141 (18.8)	169 (3.3)	-	169 (3.3)	310 (5.3)	-	310 (5.3)
6	72 (9.6)	-	72 (9.6)	13 (0.3)	-	13 (0.3)	85 (1.4)	-	85 (1.4)
Pregnant									
Yes	5 (0.9)	16 (1.4)	21 (1.2)	153 (3.9)	4 (0.5)	157 (3.4)	158 (3.6)	20 (1.1)	178 (2.8)
No	466 (83.1)	781 (67.2)	1,247 (72.3)	3,098 (79.9)	360 (48.9)	3,458 (74.9)	3,564 (80.3)	1,141 (60.1)	4,705 (74.2)
Unknown	24 (4.3)	88 (7.6)	112 (6.5)	161 (4.2)	22 (3.0)	183 (4.0)	185 (4.2)	110 (5.8)	295 (4.7)
N/A	66 (11.8)	278 (23.9)	344 (20.0)	467 (12.0)	350 (47.6)	817 (17.7)	533 (12.0)	628 (33.1)	1,161 (18.3)

	2024			pre-2024			Overall		
	COVID SARI N = 1,397[1]	**non-COVID SARI** N = 2,980[1]	**Overall** N = 4,377[1]	**COVID SARI** N = 10,163[1]	**non-COVID SARI** N = 1,672[1]	**Overall** N = 11,835[1]	**COVID SARI** N = 11,560[1]	**non-COVID SARI** N = 4,652[1]	**Overall** N = 16,212[1]
Indigenous	70 (5.0)	269 (9.0)	339 (7.7)	387 (3.8)	136 (8.1)	523 (4.4)	457 (4.0)	405 (8.7)	862 (5.3)
BMI‡	28.1 (7.5)	26.2 (8.8)	26.9 (8.4)	29.9 (7.8)	26.3 (8.9)	29.6 (8.0)	29.7 (7.8)	26.2 (8.8)	28.9 (8.2)
BMI category									
Underweight	77 (5.7)	364 (12.9)	441 (10.6)	239 (2.4)	129 (8.1)	368 (3.2)	316 (2.8)	493 (11.2)	809 (5.1)
Normal weight	253 (18.6)	415 (14.7)	668 (16.0)	1,399 (13.9)	141 (8.9)	1,540 (13.2)	1,652 (14.5)	556 (12.6)	2,208 (14.0)
Overweight	265 (19.5)	381 (13.5)	646 (15.5)	1,995 (19.9)	135 (8.5)	2,130 (18.3)	2,260 (19.8)	516 (11.7)	2,776 (17.6)
Obese - Class I	180 (13.2)	206 (7.3)	386 (9.2)	1,377 (13.7)	70 (4.4)	1,447 (12.4)	1,557 (13.7)	276 (6.3)	1,833 (11.6)
Obese - Class II	96 (7.1)	112 (4.0)	208 (5.0)	769 (7.7)	42 (2.6)	811 (7.0)	865 (7.6)	154 (3.5)	1,019 (6.4)
Obese - Class III	74 (5.4)	141 (5.0)	215 (5.1)	756 (7.5)	53 (3.3)	809 (7.0)	830 (7.3)	194 (4.4)	1,024 (6.5)
Not stated	414 (30.5)	1,197 (42.5)	1,611 (38.6)	3,503 (34.9)	1,023 (64.2)	4,526 (38.9)	3,917 (34.4)	2,220 (50.4)	6,137 (38.8)
Steroids	985 (71.1)	1,580 (53.4)	2,565 (59.0)	7,072 (76.7)	850 (52.1)	7,922 (73.0)	8,057 (75.9)	2,430 (53.0)	10,487 (69.0)
Tocilizumab	50 (3.6)	4 (0.1)	54 (1.2)	638 (6.3)	0 (0.0)	638 (5.4)	688 (6.0)	4 (0.1)	692 (4.3)
Neutralizing antibodies	2 (0.1)	0 (0.0)	2 (0.0)	174 (1.7)	0 (0.0)	174 (1.5)	176 (1.5)	0 (0.0)	176 (1.1)
Remdesivir	794 (56.8)	2 (0.1)	796 (18.2)	3,931 (38.7)	1 (0.1)	3,932 (33.2)	4,725 (40.9)	3 (0.1)	4,728 (29.2)
Invasive ventilation*	470 (33.7)	975 (32.8)	1,445 (33.1)	3,489 (36.6)	497 (29.8)	3,986 (35.6)	3,959 (36.2)	1,472 (31.7)	5,431 (34.9)
Prone positioning†	43 (3.1)	103 (3.5)	146 (3.3)	697 (13.6)	96 (5.8)	793 (11.7)	740 (11.3)	199 (4.3)	939 (8.4)
ECMO	11 (0.8)	46 (1.5)	57 (1.3)	142 (1.5)	44 (2.6)	186 (1.7)	153 (1.4)	90 (1.9)	243 (1.6)
Dialysis	119 (8.5)	180 (6.0)	299 (6.8)	462 (9.0)	100 (6.0)	562 (8.3)	581 (8.9)	280 (6.0)	861 (7.7)
Antibiotic therapy	1,181 (85.1)	2,635 (89.1)	3,816 (87.8)	4,684 (81.6)	1,440 (88.2)	6,124 (83.1)	5,865 (82.3)	4,075 (88.8)	9,940 (84.9)

[1]Mean (SD); n (%)
*Mean and SD were based on at least one episode of mechanical ventilation
†Defined as at least one observation of prone positioning while not receiving invasive ventilation
‡BMI values < 15 or > 60 were excluded from the BMI analysis

Figure 8. Outcome of Adult ICU admission

The outcome of Adult ICU admission for SARI, grouped by sex and age range are presented below.

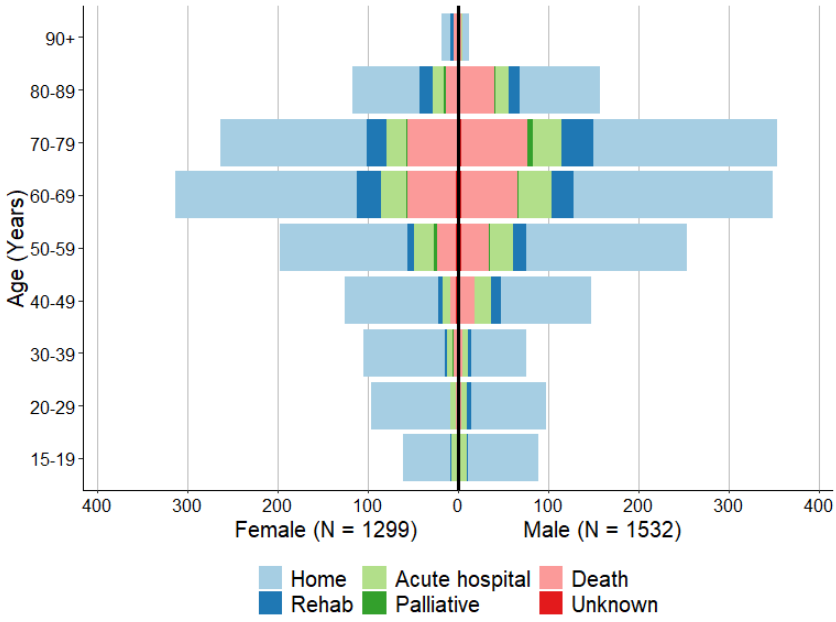
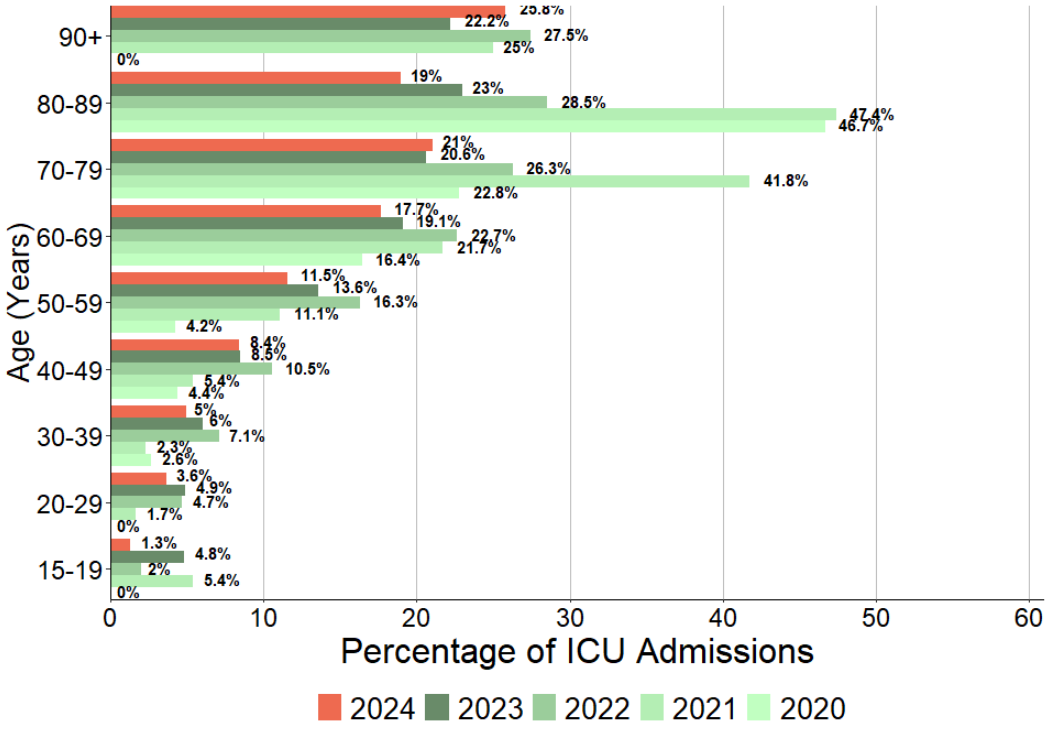


Figure 9. Age range and mortality distribution

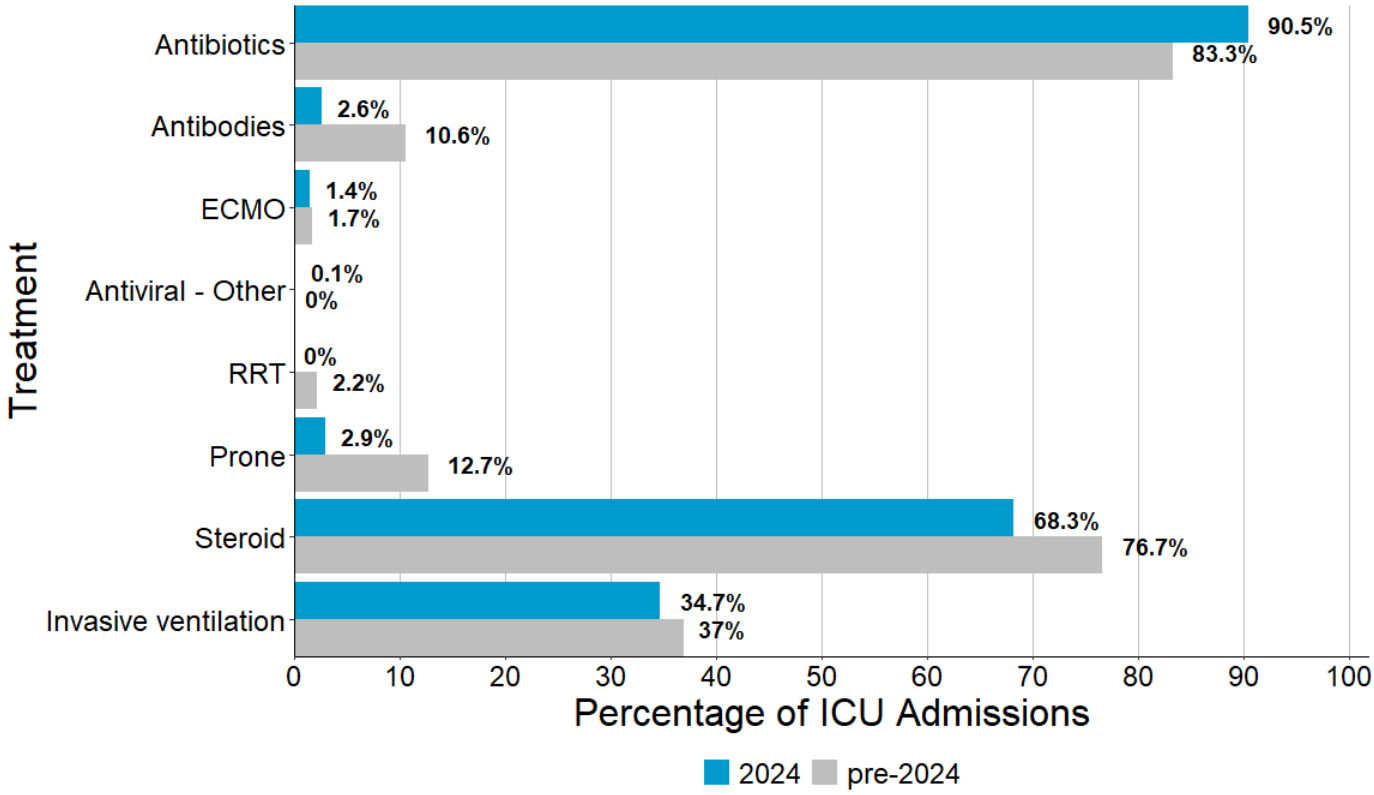
Figure 9 presents the average percent mortality over the past 5 years (2020 to 2024), grouped by age range.



Treatments

Figure 10. Treatment reported at any time during ICU admission according to the phase

The treatments received by patients at any time during ICU admission are presented in Figures 10 and 11 for ICU admissions.



Comorbidities

The prevalence and type of reported comorbidities in ICU admissions is displayed in Figures 11 and 12.

Figure 11. Number of comorbidities reported in admitted ICU patients

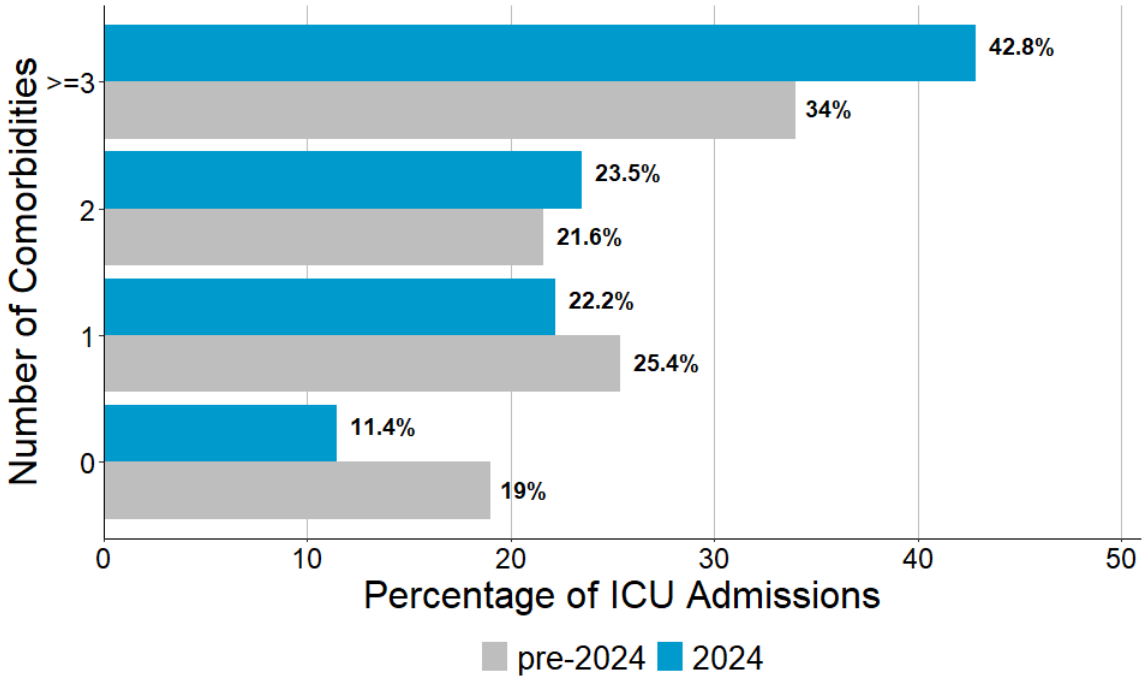


Figure 12. Prevalence of comorbidities for admitted ICU patients

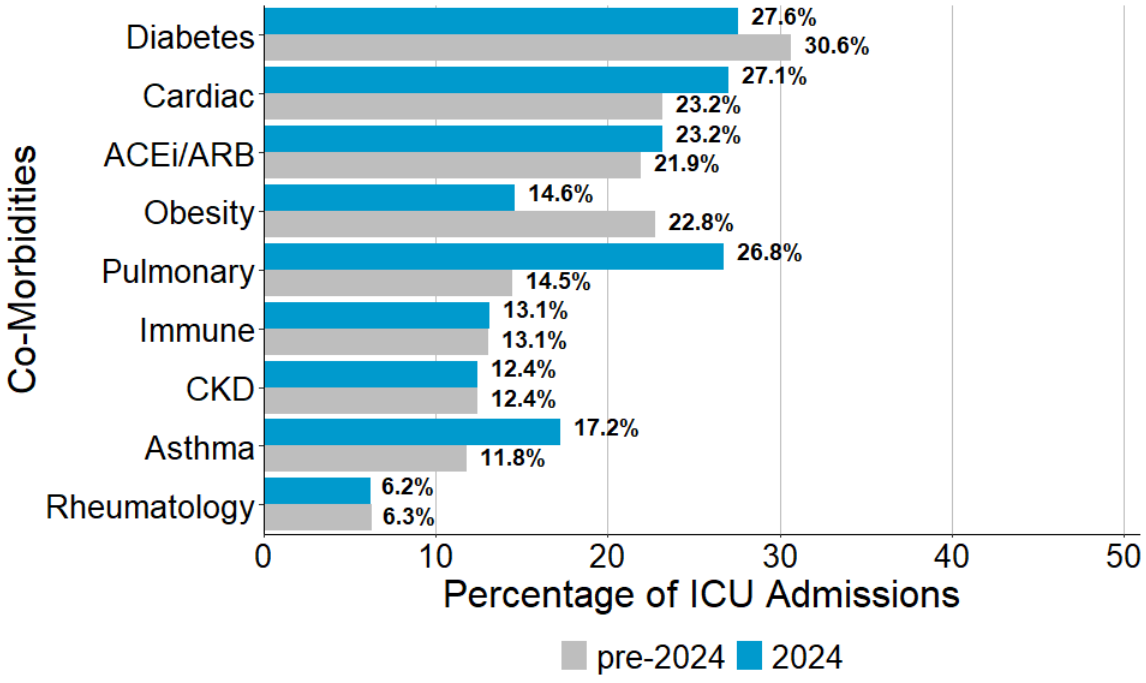
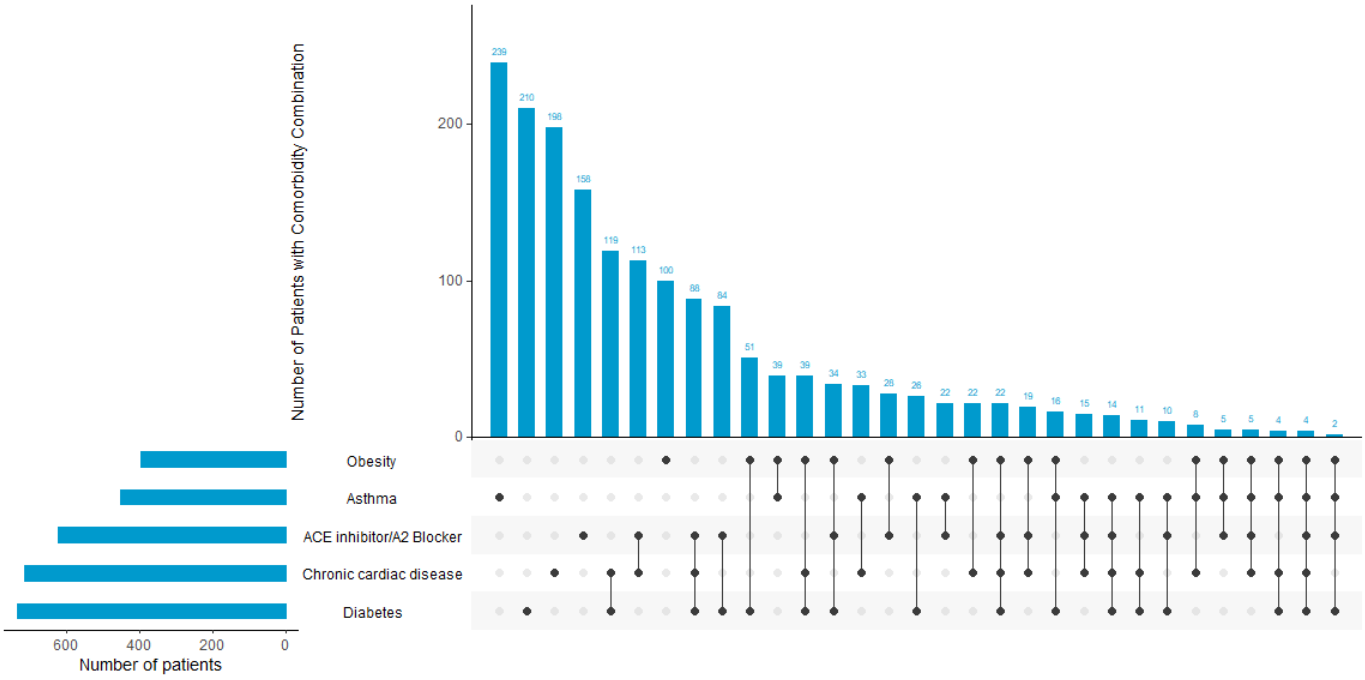


Figure 13. Distribution of common combinations of reported comorbidities in 2024



Outcome

Table 4. Patient outcome summary

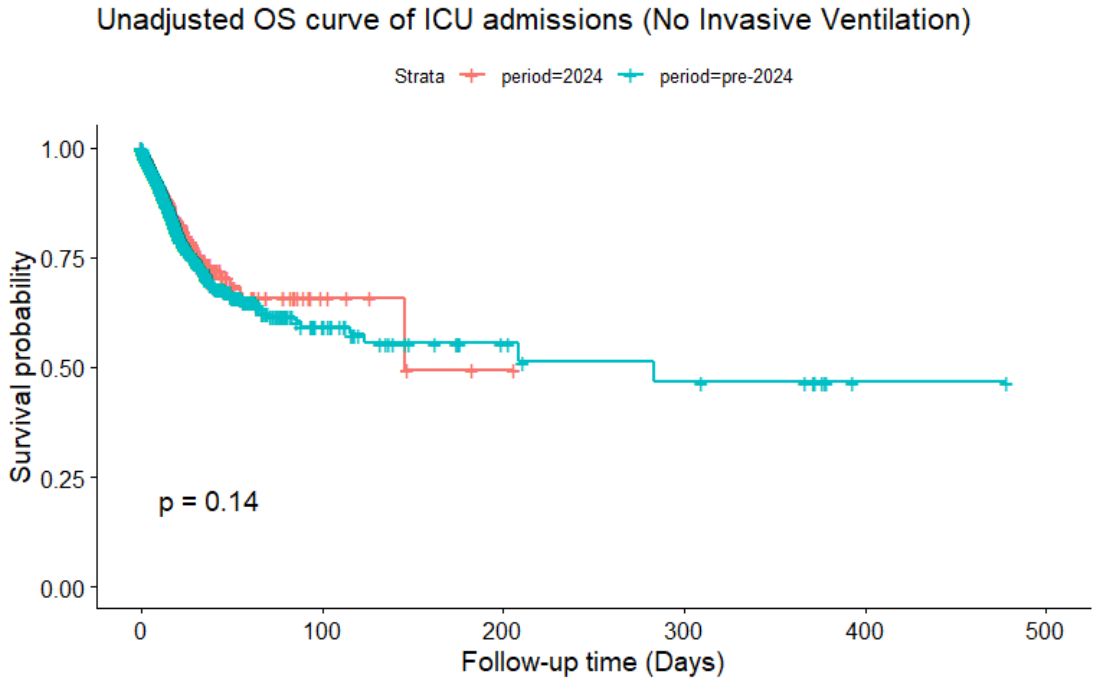
ICU and hospital outcomes are summarised for ICU admissions. P-values are calculated using t-test (continuous variables) or Chi-square test (categorical variables). The Pearson residuals and expected counts of Chi-square test are listed. High residual values indicate large deviations between the observe counts and expected counts.

	2024			pre-2024			Overall		
	COVID SARI N = 1,231[1]	**non-COVID SARI** N = 1,603[1]	**Overall** N = 2,834[1]	**COVID SARI** N = 9,717[1]	**non-COVID SARI** N = 746[1]	**Overall** N = 10,463[1]	**COVID SARI** N = 10,948[1]	**non-COVID SARI** N = 2,349[1]	**Overall** N = 13,297[1]
Length of stay (ICU)	5.5 (7.0)	6.3 (9.8)	6.0 (8.7)	8.1 (14.7)	7.9 (20.6)	8.0 (15.2)	7.8 (14.1)	6.8 (14.1)	7.6 (14.1)
Length of stay (Hospital)	14.4 (16.9)	14.5 (22.7)	14.5 (20.4)	16.7 (24.6)	15.8 (26.8)	16.7 (24.8)	16.5 (23.9)	14.9 (24.1)	16.2 (23.9)
Days of ventilation*	6.2 (7.7)	8.6 (17.4)	7.6 (14.3)	11.3 (24.3)	10.7 (25.0)	11.3 (24.3)	10.8 (23.1)	9.3 (20.1)	10.5 (22.6)
ICU outcome									
Death	124 (10.1%)	138 (8.6%)	262 (9.2%)	1,346 (13.9%)	71 (9.5%)	1,417 (13.5%)	1,470 (13.4%)	209 (8.9%)	1,679 (12.6%)
Home	57 (4.6%)	95 (5.9%)	152 (5.4%)	339 (3.5%)	37 (5.0%)	376 (3.6%)	396 (3.6%)	132 (5.6%)	528 (4.0%)
Other hospital	41 (3.3%)	45 (2.8%)	86 (3.0%)	317 (3.3%)	25 (3.4%)	342 (3.3%)	358 (3.3%)	70 (3.0%)	428 (3.2%)
Other rehab	0 (0.0%)	2 (0.1%)	2 (0.1%)	32 (0.3%)	1 (0.1%)	33 (0.3%)	32 (0.3%)	3 (0.1%)	35 (0.3%)
Unknown	4 (0.3%)	6 (0.4%)	10 (0.4%)	60 (0.6%)	1 (0.1%)	61 (0.6%)	64 (0.6%)	7 (0.3%)	71 (0.5%)
Wards	1,005 (81.6%)	1,317 (82.2%)	2,322 (81.9%)	7,623 (78.5%)	611 (81.9%)	8,234 (78.7%)	8,628 (78.8%)	1,928 (82.1%)	10,556 (79.4%)
Hospital outcome									
Death	205 (16.7%)	195 (12.2%)	400 (14.1%)	1,758 (18.1%)	98 (13.1%)	1,856 (17.7%)	1,963 (17.9%)	293 (12.5%)	2,256 (17.0%)
Discharged home	763 (62.0%)	1,184 (73.9%)	1,947 (68.7%)	6,180 (63.6%)	517 (69.3%)	6,697 (64.0%)	6,943 (63.4%)	1,701 (72.4%)	8,644 (65.0%)
Palliative discharge	10 (0.8%)	9 (0.6%)	19 (0.7%)	43 (0.4%)	1 (0.1%)	44 (0.4%)	53 (0.5%)	10 (0.4%)	63 (0.5%)
Transfer to another facility (rehab)	104 (8.4%)	84 (5.2%)	188 (6.6%)	949 (9.8%)	38 (5.1%)	987 (9.4%)	1,053 (9.6%)	122 (5.2%)	1,175 (8.8%)
Transfer to other facility (acute hospital)	139 (11.3%)	121 (7.5%)	260 (9.2%)	667 (6.9%)	90 (12.1%)	757 (7.2%)	806 (7.4%)	211 (9.0%)	1,017 (7.6%)
Unknown	10 (0.8%)	10 (0.6%)	20 (0.7%)	120 (1.2%)	2 (0.3%)	122 (1.2%)	130 (1.2%)	12 (0.5%)	142 (1.1%)

[1]Mean (SD); n (%)
*Mean and SD were calculated based on data of patients with at least one episode of mechanical ventilation treatment during their ICU admission.

Figure 14. Kaplan-Meier curve

The over-all unadjusted survival status of ICU admissions with and without invasive ventilation are shown in Figure 14. The survival data is censored when patients were deceased in hospital or discharged from the hospital. P-values were calculated using log-ranked test.



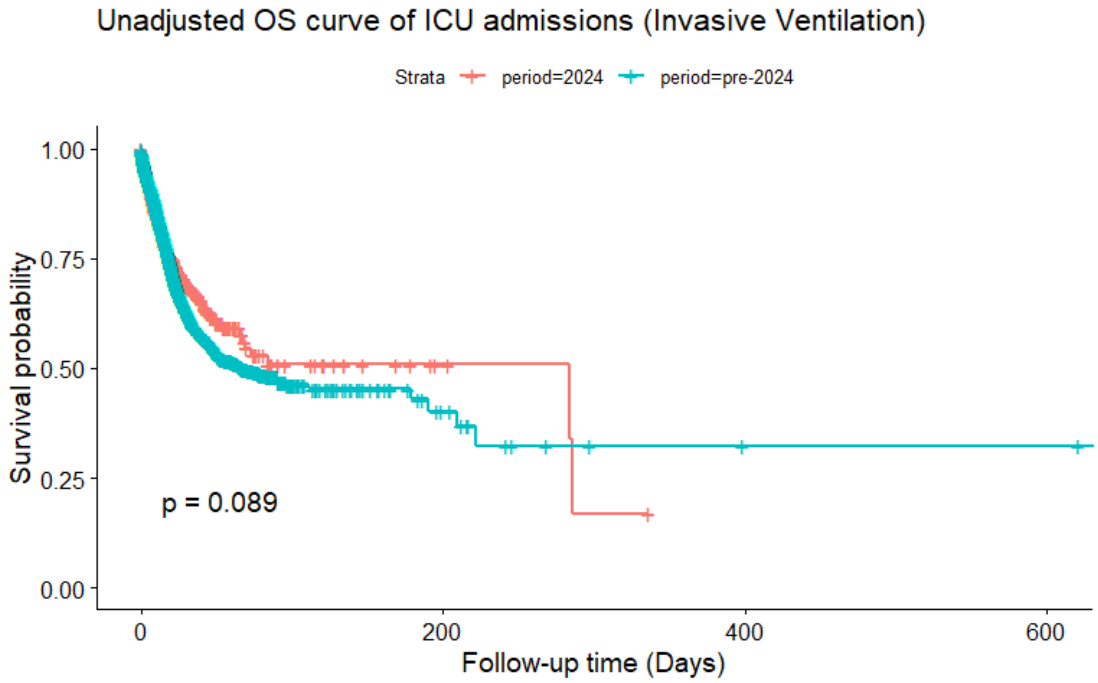


Figure 15. SARI Pathogen by Age Group

The numbers of each pathogen causing SARI ICU admissions, by age group, is displayed in Figure 15.

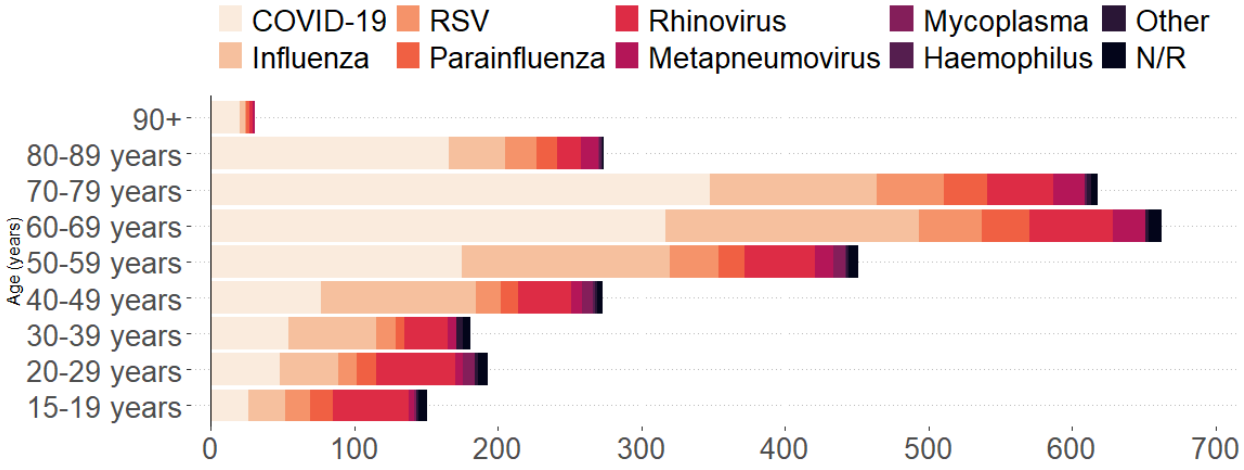


Figure 16. SARI Pathogen type

The percentage of patient presentations to ICU with SARI, listed by pathogen type, is displayed in Figure 16.

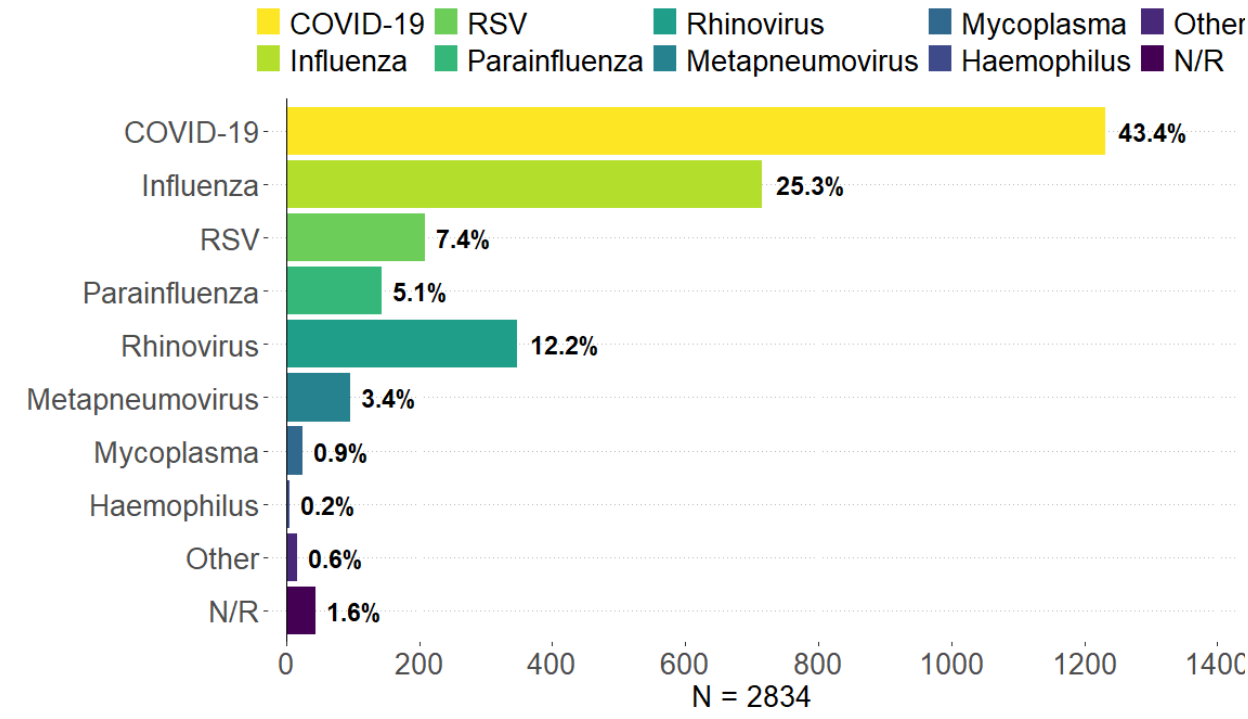
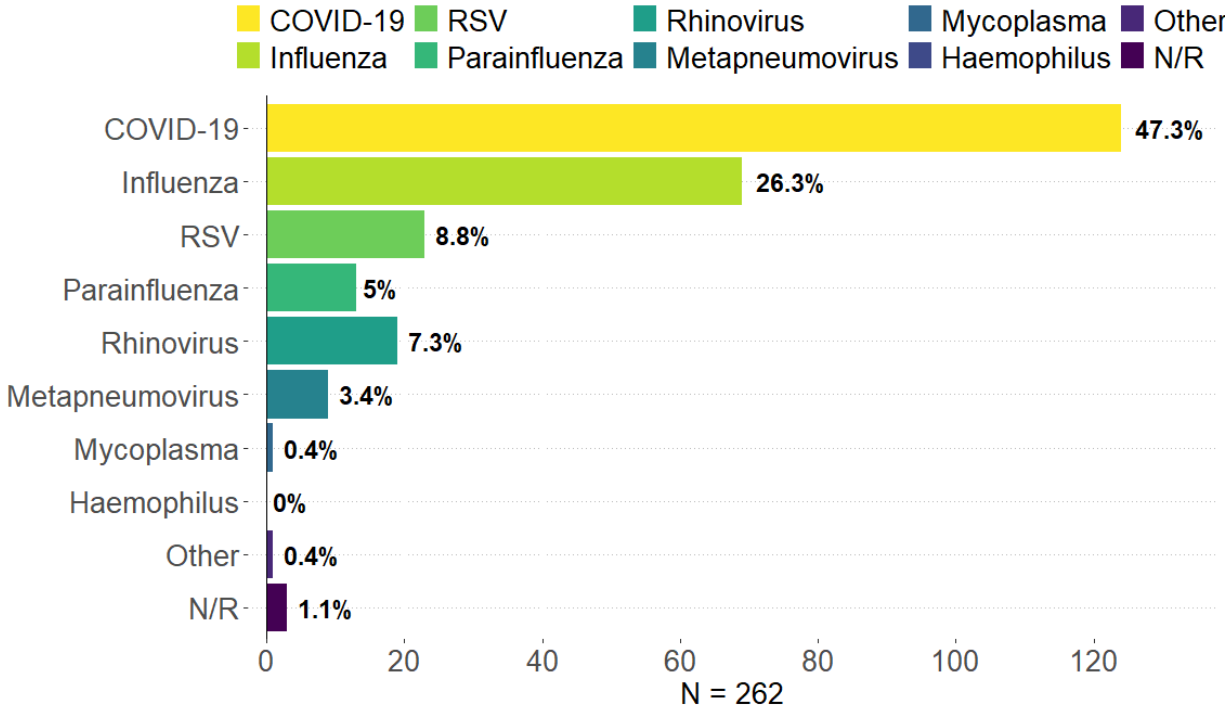


Figure 17. Mortalities of Patients admitted to ICU with SARI, by Pathogen type

Numbers of deaths in ICU of patients admitted with SARI, by initial pathogen. Death may not be attributable to the diagnosed pathogen and may have been from other causes.



Paediatric population

Analysis of Paediatric population (0 to 14 years old)

Number of ICU admissions

The daily number of ICU beds occupied by Paediatric COVID-19 patients are shown in Figure 18 and a State/Territory breakdown of admissions is presented in Figure 19.

Figure 18. Daily number of ICU beds occupied by patients with confirmed or strong clinical suspicion of COVID-19

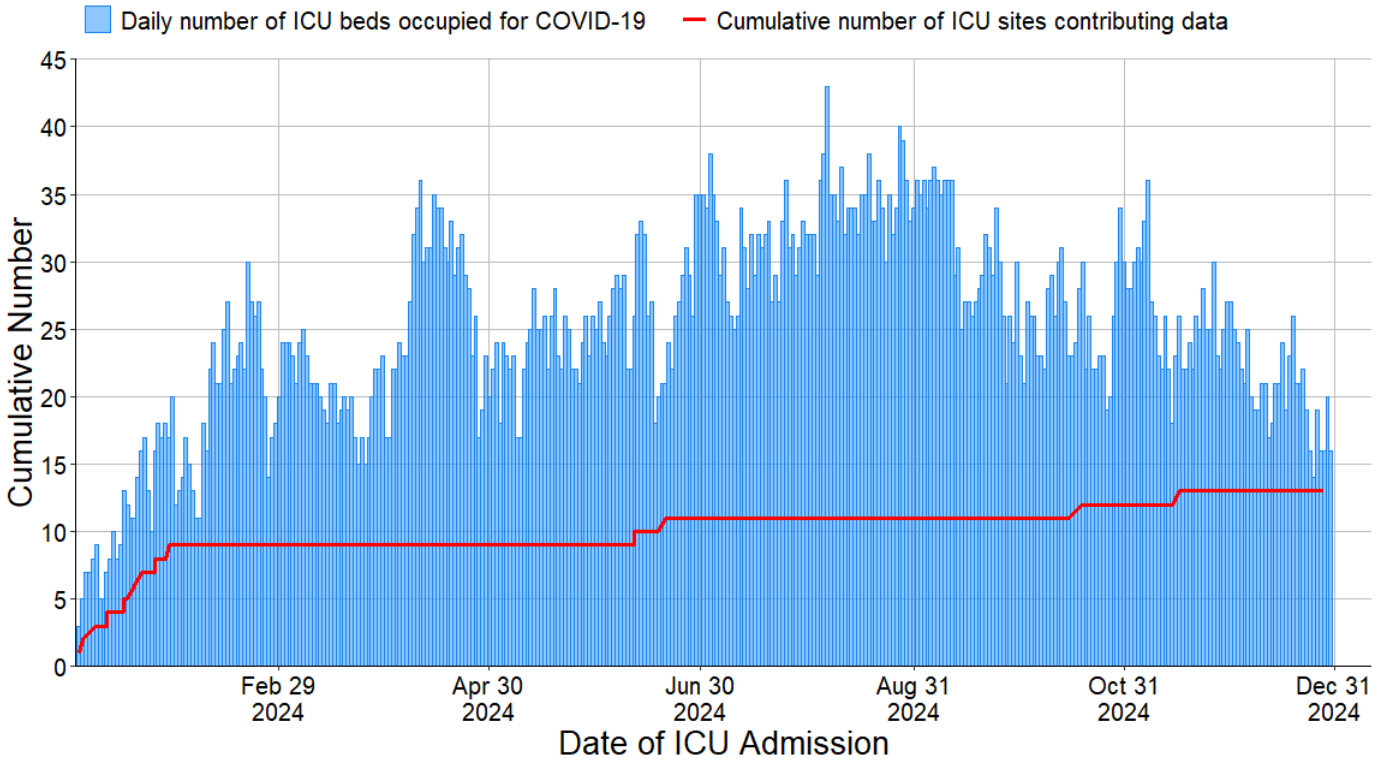
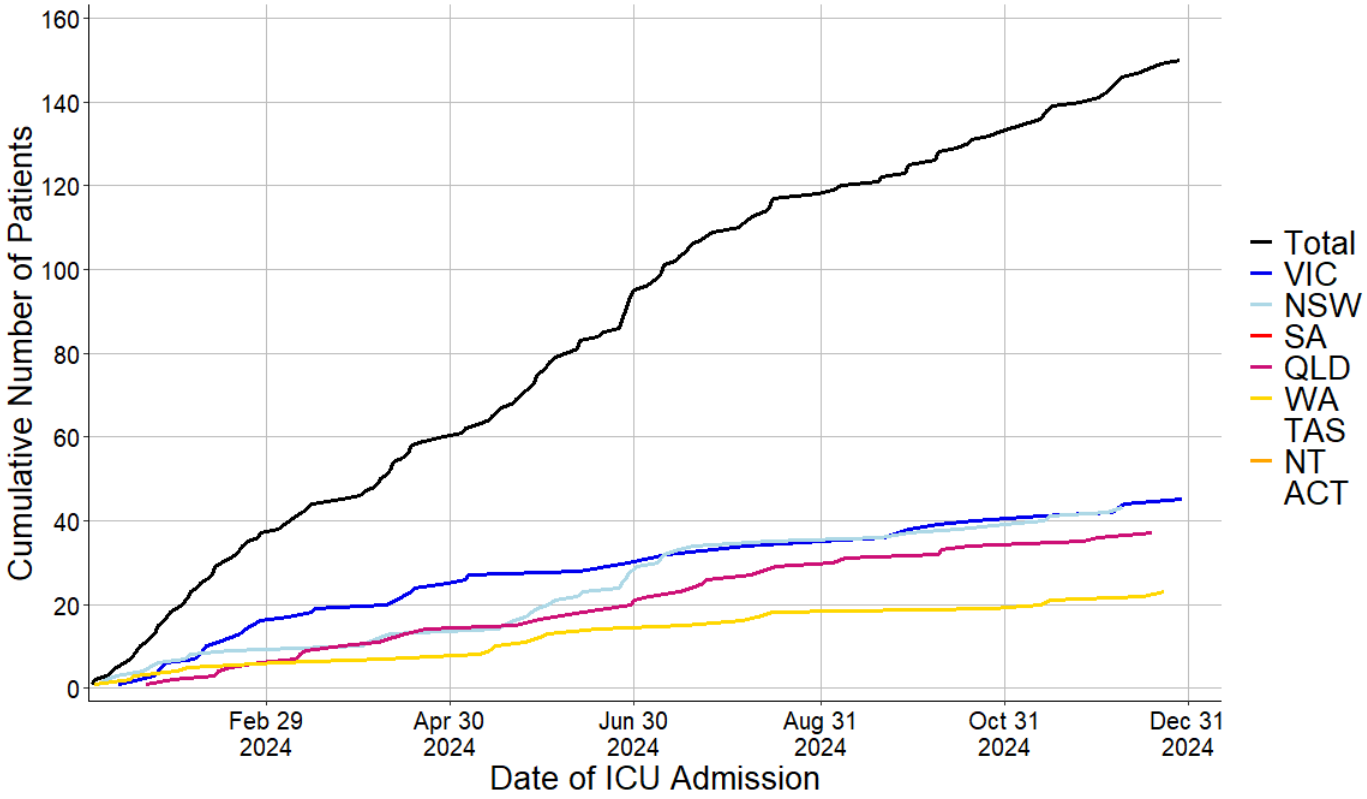


Figure 19. Cumulative number of ICU admissions with confirmed or strong clinical suspicion of COVID-19 by State and Territory



Demographics

Patient characteristics of Paediatric ICU admissions are provided in Table 5 and Figures 20 to 22.

Table 5. Characteristics of paediatric patients admitted to ICU

	2024			pre-2024			Overall		
	COVID SARI N = 166[1]	**non-COVID SARI** N = 1,375[1]	**Overall** N = 1,541[1]	**COVID SARI** N = 445[1]	**non-COVID SARI** N = 925[1]	**Overall** N = 1,370[1]	**COVID SARI** N = 611[1]	**non-COVID SARI** N = 2,300[1]	**Overall** N = 2,911[1]
Age	6.0 (4.1)	5.1 (3.9)	5.2 (3.9)	6.6 (4.2)	4.9 (3.8)	5.5 (4.0)	6.4 (4.2)	5.1 (3.8)	5.3 (3.9)
Age group									
0-4 years	75 (45.2%)	750 (54.5%)	825 (53.5%)	169 (38.0%)	523 (56.5%)	692 (50.5%)	244 (39.9%)	1,273 (55.3%)	1,517 (52.1%)
5-9 years	49 (29.5%)	373 (27.1%)	422 (27.4%)	152 (34.2%)	252 (27.2%)	404 (29.5%)	201 (32.9%)	625 (27.2%)	826 (28.4%)
10-14 years	42 (25.3%)	252 (18.3%)	294 (19.1%)	124 (27.9%)	150 (16.2%)	274 (20.0%)	166 (27.2%)	402 (17.5%)	568 (19.5%)
Sex									
Male	93 (56.0%)	755 (54.9%)	848 (55.0%)	257 (57.9%)	556 (60.1%)	813 (59.4%)	350 (57.4%)	1,311 (57.0%)	1,661 (57.1%)
Female	73 (44.0%)	620 (45.1%)	693 (45.0%)	187 (42.1%)	369 (39.9%)	556 (40.6%)	260 (42.6%)	989 (43.0%)	1,249 (42.9%)
Received COVID-19 vaccine	7 (9.1%)	-	7 (9.1%)	37 (11.4%)	0 (0.0%)	37 (11.3%)	44 (10.9%)	0 (0.0%)	44 (10.9%)
Number of vaccinations									
1	0 (0.0%)	-	0 (0.0%)	12 (34.3%)	-	12 (34.3%)	12 (28.6%)	-	12 (28.6%)
2	5 (71.4%)	-	5 (71.4%)	22 (62.9%)	-	22 (62.9%)	27 (64.3%)	-	27 (64.3%)
3	1 (14.3%)	-	1 (14.3%)	1 (2.9%)	-	1 (2.9%)	2 (4.8%)	-	2 (4.8%)
5	1 (14.3%)	-	1 (14.3%)	0 (0.0%)	-	0 (0.0%)	1 (2.4%)	-	1 (2.4%)
Indigenous	12 (7.2%)	106 (7.7%)	118 (7.7%)	33 (7.4%)	88 (9.5%)	121 (8.8%)	45 (7.4%)	194 (8.4%)	239 (8.2%)
BMI‡	16.1 (3.4)	17.3 (6.1)	17.2 (5.9)	17.7 (6.7)	16.7 (5.7)	17.0 (6.0)	17.1 (5.7)	17.2 (6.0)	17.2 (6.0)
BMI category									
Underweight	48 (28.9%)	414 (30.1%)	462 (30.0%)	63 (14.2%)	176 (19.0%)	239 (17.4%)	111 (18.2%)	590 (25.7%)	701 (24.1%)
Normal weight	6 (3.6%)	99 (7.2%)	105 (6.8%)	18 (4.0%)	37 (4.0%)	55 (4.0%)	24 (3.9%)	136 (5.9%)	160 (5.5%)
Overweight	3 (1.8%)	15 (1.1%)	18 (1.2%)	7 (1.6%)	8 (0.9%)	15 (1.1%)	10 (1.6%)	23 (1.0%)	33 (1.1%)
Obese - Class I	0 (0.0%)	6 (0.4%)	6 (0.4%)	2 (0.4%)	2 (0.2%)	4 (0.3%)	2 (0.3%)	8 (0.3%)	10 (0.3%)
Obese - Class II	0 (0.0%)	5 (0.4%)	5 (0.3%)	1 (0.2%)	0 (0.0%)	1 (0.1%)	1 (0.2%)	5 (0.2%)	6 (0.2%)
Obese - Class III	0 (0.0%)	8 (0.6%)	8 (0.5%)	1 (0.2%)	3 (0.3%)	4 (0.3%)	1 (0.2%)	11 (0.5%)	12 (0.4%)
Not stated	109 (65.7%)	828 (60.2%)	937 (60.8%)	353 (79.3%)	699 (75.6%)	1,052 (76.8%)	462 (75.6%)	1,527 (66.4%)	1,989 (68.3%)

	2024			pre-2024			Overall		
	COVID SARI N = 166[1]	**non-COVID SARI** N = 1,375[1]	**Overall** N = 1,541[1]	**COVID SARI** N = 445[1]	**non-COVID SARI** N = 925[1]	**Overall** N = 1,370[1]	**COVID SARI** N = 611[1]	**non-COVID SARI** N = 2,300[1]	**Overall** N = 2,911[1]
Steroids	90 (54.2%)	557 (40.7%)	647 (42.1%)	247 (59.7%)	375 (40.8%)	622 (46.6%)	337 (58.1%)	932 (40.7%)	1,269 (44.2%)
Tocilizumab	1 (0.6%)	1 (0.1%)	2 (0.1%)	3 (0.7%)	0 (0.0%)	3 (0.2%)	4 (0.7%)	1 (0.0%)	5 (0.2%)
Neutralizing antibodies	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (0.7%)	0 (0.0%)	3 (0.2%)	3 (0.5%)	0 (0.0%)	3 (0.1%)
Remdesivir	25 (15.1%)	1 (0.1%)	26 (1.7%)	70 (15.7%)	0 (0.0%)	70 (5.1%)	95 (15.5%)	1 (0.0%)	96 (3.3%)
Invasive ventilation*	66 (39.8%)	396 (28.8%)	462 (30.0%)	119 (27.5%)	226 (24.4%)	345 (25.4%)	185 (30.9%)	622 (27.1%)	807 (27.9%)
Prone positioning†	6 (3.6%)	57 (4.1%)	63 (4.1%)	21 (6.9%)	65 (7.1%)	86 (7.0%)	27 (5.7%)	122 (5.3%)	149 (5.4%)
ECMO	2 (1.2%)	14 (1.0%)	16 (1.0%)	3 (0.7%)	17 (1.8%)	20 (1.5%)	5 (0.8%)	31 (1.3%)	36 (1.2%)
Dialysis	4 (2.4%)	25 (1.8%)	29 (1.9%)	7 (2.3%)	23 (2.5%)	30 (2.4%)	11 (2.3%)	48 (2.1%)	59 (2.1%)
Antibiotic therapy	126 (75.9%)	1,148 (83.9%)	1,274 (83.0%)	223 (74.6%)	776 (84.6%)	999 (82.2%)	349 (75.1%)	1,924 (84.2%)	2,273 (82.6%)

[1]Mean (SD); n (%)
*Mean and SD were based on at least one episode of mechanical ventilation
†Defined as at least one observation of prone positioning while not receiving invasive ventilation
‡BMI values where height/length, weight or BMI values are outside the WHO *z*-score ranges for patient age were excluded from the BMI analysis

Figure 20. Outcome of Paediatric ICU admission

Age and sex distribution

The outcome of ICU admission for SARI, grouped by sex and age range are presented below.

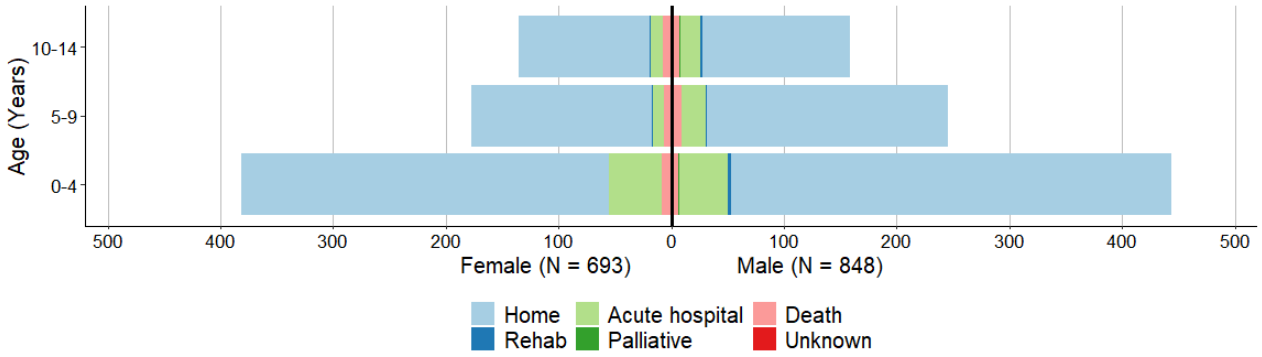


Figure 21. Age range and mortality distribution

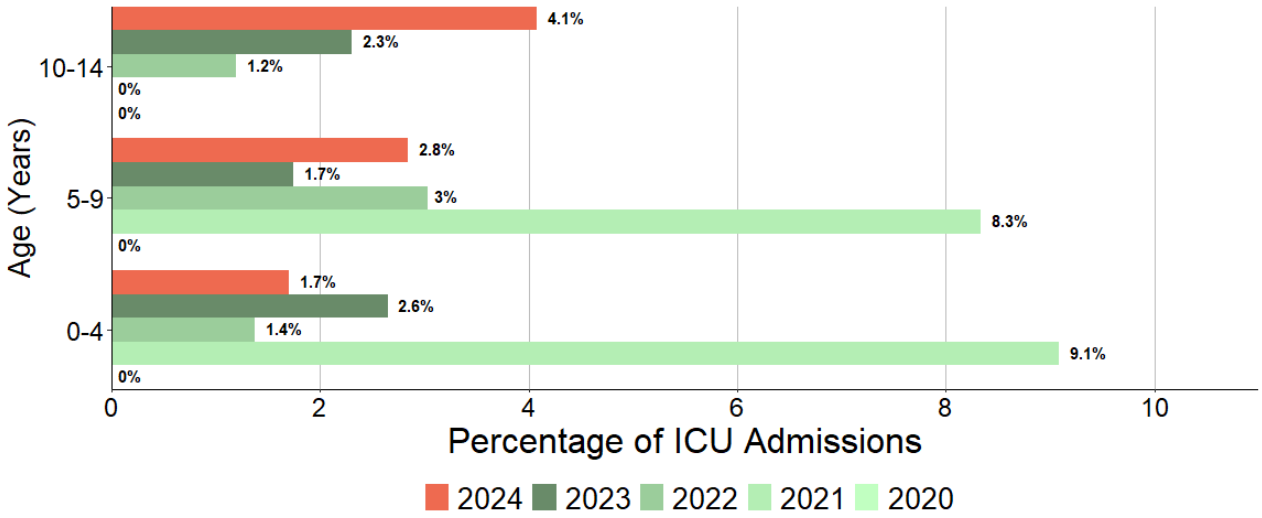
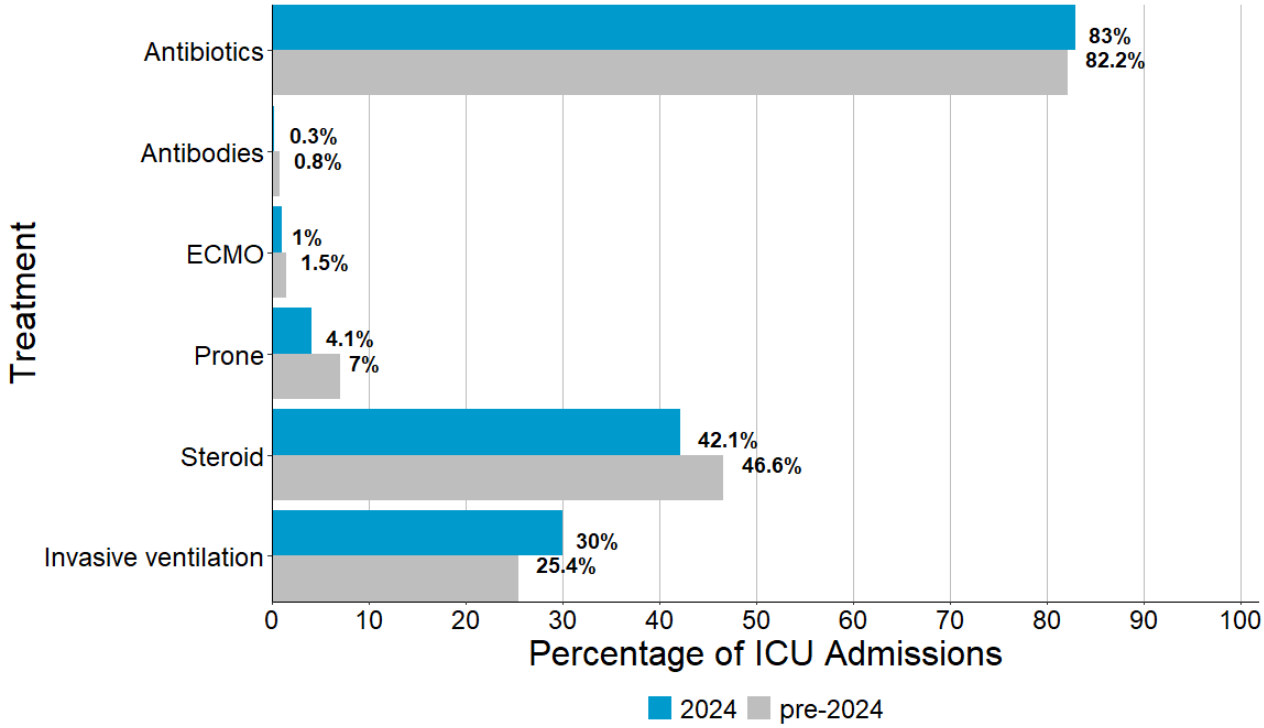


Figure 21 presents the average percent mortality over the past 5 years (2020 to 2024), grouped by age range

Treatments

Figure 22. Treatment reported at any time during Paediatric ICU admission according to the phase



The treatments received by patients at any time during ICU admission are presented in Figure 22.

Comorbidities

The prevalence of reported comorbidities for Paediatric ICU admissions.

Figure 23. Number of comorbidities for admitted Paediatric ICU patients

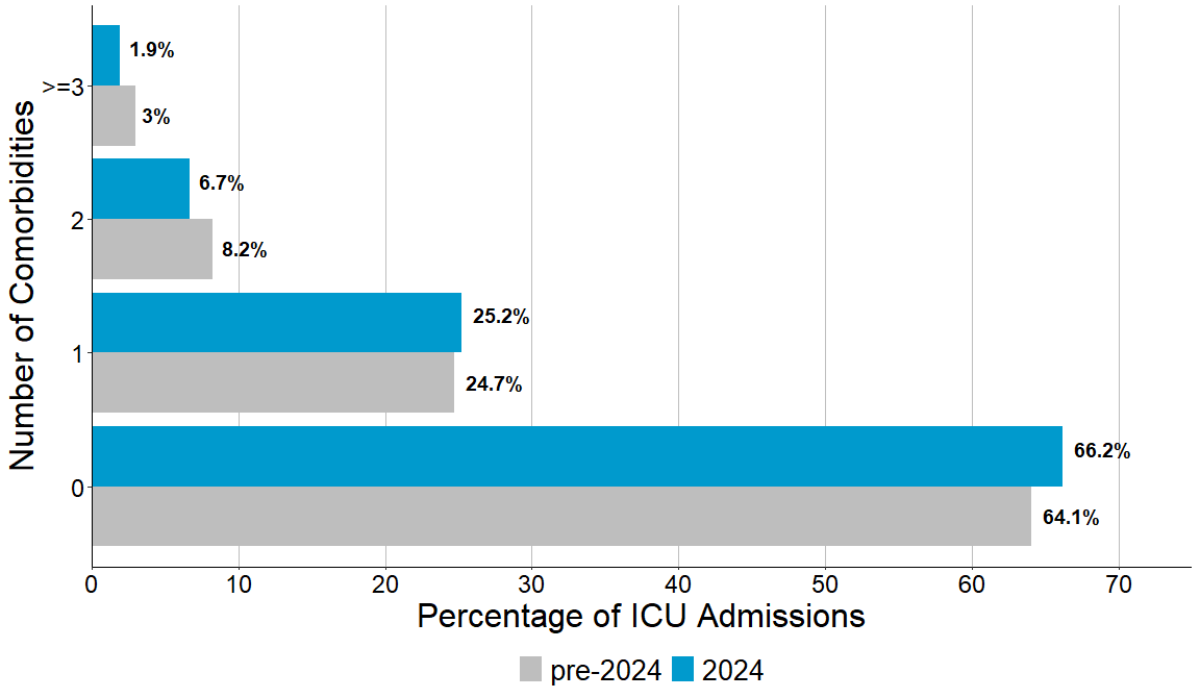


Figure 24. Prevalence of comorbidities for admitted Paediatric ICU patients

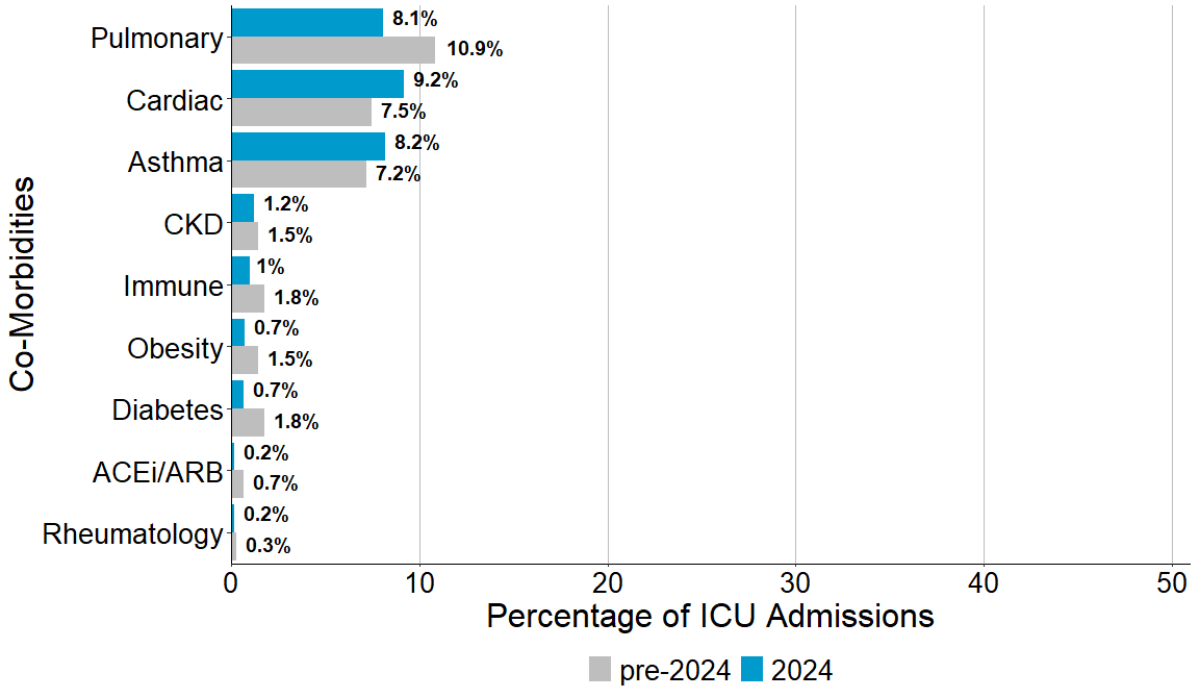
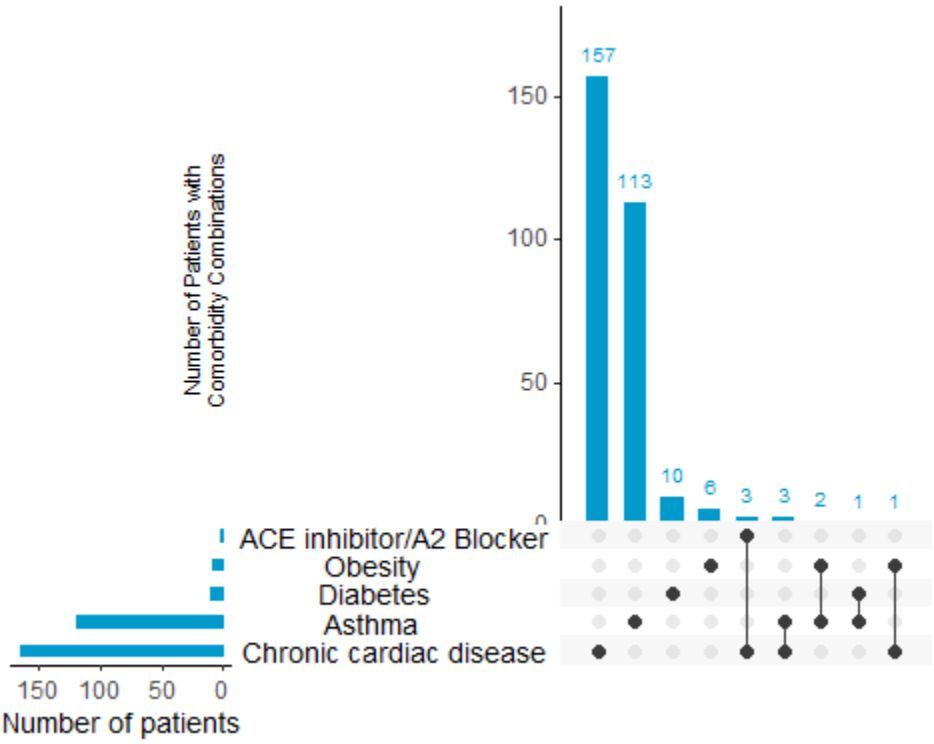


Figure 25. Distribution of common combinations of reported comorbidities in 2024



Outcome

Table 6. Patient outcome summary

ICU and hospital outcomes are summarised for Paediatric ICU admissions. P-values are calculated using t-test (continuous variables) or Chi-square test (categorical variables). The Pearson residuals and expected counts of Chi-square test are listed. High residual values indicate large deviations between the observe counts and expected counts.

	2024			pre-2024			Total		
	COVID SARI N = 166[1]	**non-COVID SARI** N = 1,375[1]	**Overall** N = 1,541[1]	**COVID SARI** N = 445[1]	**non-COVID SARI** N = 925[1]	**Overall** N = 1,370[1]	**COVID SARI** N = 611[1]	**non-COVID SARI** N = 2,300[1]	**Overall** N = 2,911[1]
Length of stay (ICU)	5.1 (9.6)	4.5 (8.6)	4.6 (8.7)	5.5 (22.0)	4.1 (9.1)	4.6 (14.6)	5.4 (19.4)	4.4 (8.9)	4.6 (11.9)
Length of stay (Hospital)	11.1 (15.9)	11.9 (24.0)	11.8 (23.3)	14.2 (37.6)	9.3 (15.1)	10.9 (24.8)	13.3 (33.1)	10.9 (20.9)	11.4 (24.0)
Days of ventilation*	4.4 (6.3)	9.8 (41.1)	9.0 (38.2)	8.0 (24.5)	5.1 (6.2)	6.1 (15.3)	6.7 (20.2)	8.1 (33.0)	7.8 (30.6)
ICU outcome									
Death	6 (4%)	25 (2%)	31 (2%)	13 (3%)	15 (2%)	28 (2%)	19 (3%)	40 (2%)	59 (2%)
Home	18 (11%)	105 (8%)	123 (8%)	59 (13%)	62 (7%)	121 (9%)	77 (13%)	167 (7%)	244 (8%)
Other hospital	2 (1%)	64 (5%)	66 (4%)	21 (5%)	34 (4%)	55 (4%)	23 (4%)	98 (4%)	121 (4%)
Other rehab	0 (0%)	2 (0%)	2 (0%)	4 (1%)	1 (0%)	5 (0%)	4 (1%)	3 (0%)	7 (0%)
Unknown	0 (0%)	1 (0%)	1 (0%)	2 (0%)	0 (0%)	2 (0%)	2 (0%)	1 (0%)	3 (0%)
Wards	140 (84%)	1,178 (86%)	1,318 (86%)	346 (78%)	813 (88%)	1,159 (85%)	486 (80%)	1,991 (87%)	2,477 (85%)
Hospital outcome									
Death	8 (5%)	30 (2%)	38 (2%)	13 (3%)	18 (2%)	31 (2%)	21 (3%)	48 (2%)	69 (2%)
Discharged home	144 (87%)	1,193 (87%)	1,337 (87%)	396 (89%)	775 (84%)	1,171 (85%)	540 (88%)	1,968 (86%)	2,508 (86%)
Palliative discharge	0 (0%)	2 (0%)	2 (0%)	1 (0%)	5 (1%)	6 (0%)	1 (0%)	7 (0%)	8 (0%)
Transfer to another facility (rehab)	2 (1%)	6 (0%)	8 (1%)	1 (0%)	6 (1%)	7 (1%)	3 (0%)	12 (1%)	15 (1%)
Transfer to other facility (acute hospital)	12 (7%)	139 (10%)	151 (10%)	31 (7%)	121 (13%)	152 (11%)	43 (7%)	260 (11%)	303 (10%)
Unknown	0 (0%)	5 (0%)	5 (0%)	3 (1%)	0 (0%)	3 (0%)	3 (0%)	5 (0%)	8 (0%)

[1]Mean (SD); n (%)
*Mean and SD were calculated based on data of patients with at least one episode of mechanical ventilation treatment during their ICU admission.

Figure 26. Kaplan-Meier curve - Paediatric patients

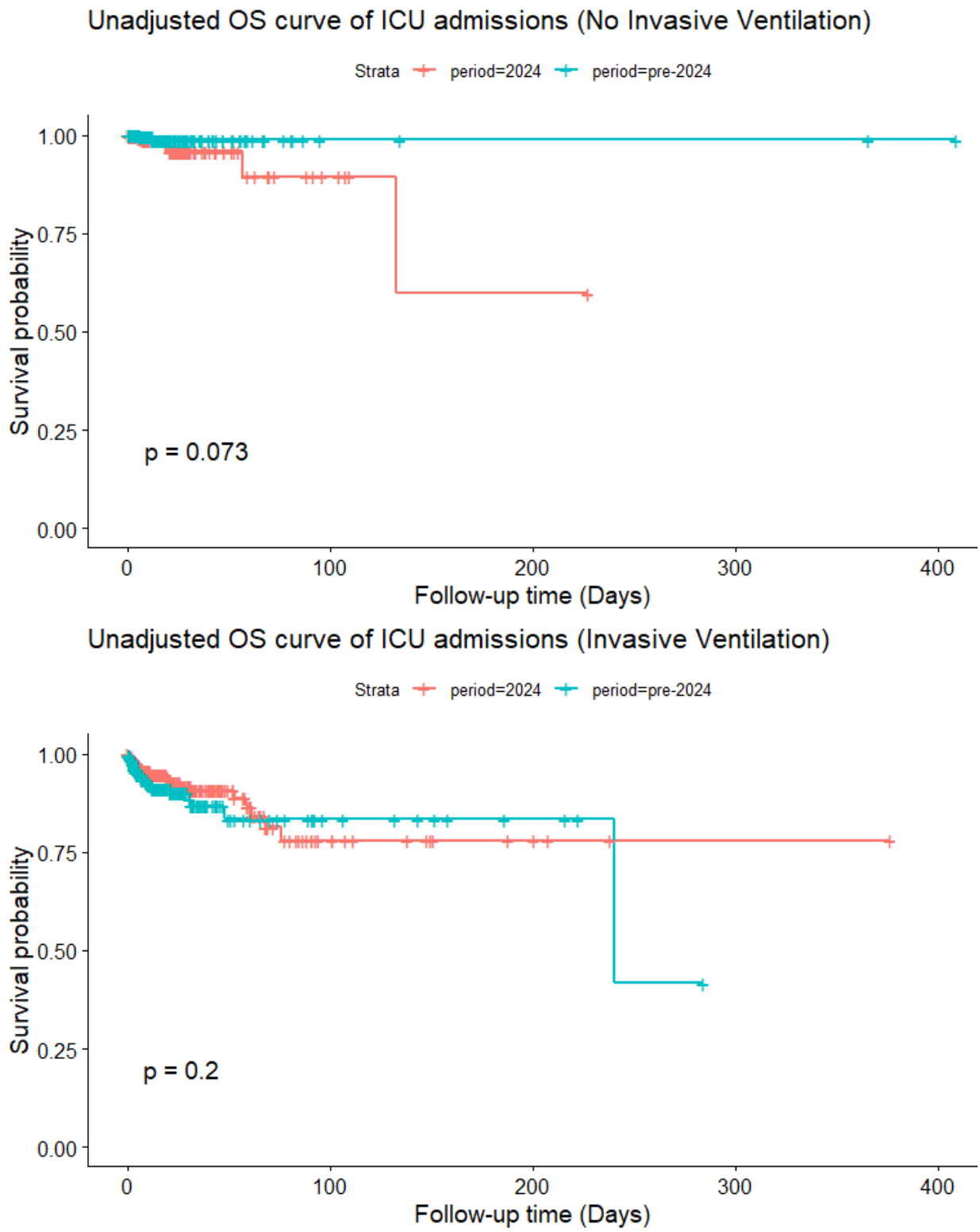


Figure 27. SARI Pathogen by Paediatric Age Group

The numbers of each pathogen causing SARI Paediatric ICU admissions, by age group, is displayed in Figure 27.

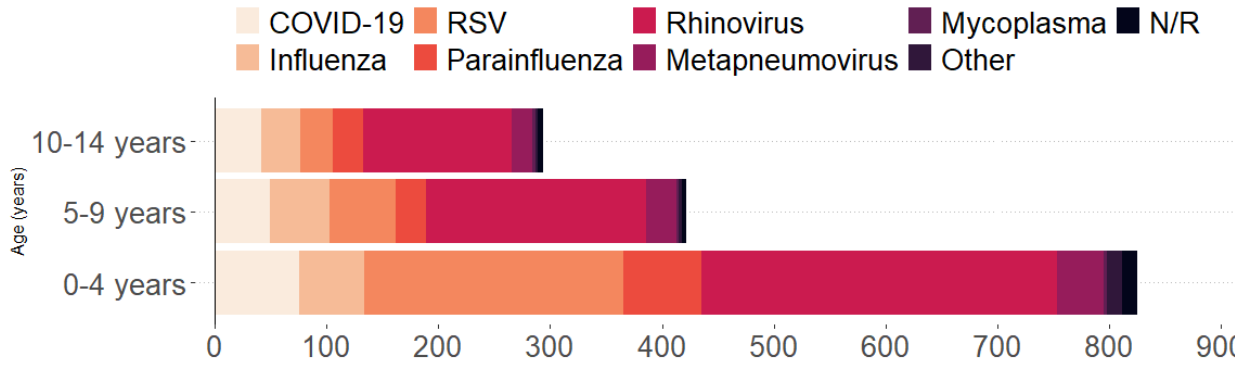


Figure 28. SARI Pathogen type

The percentage of Paediatric patient presentations to ICU with SARI, listed by pathogen type, is displayed in Figure 28.

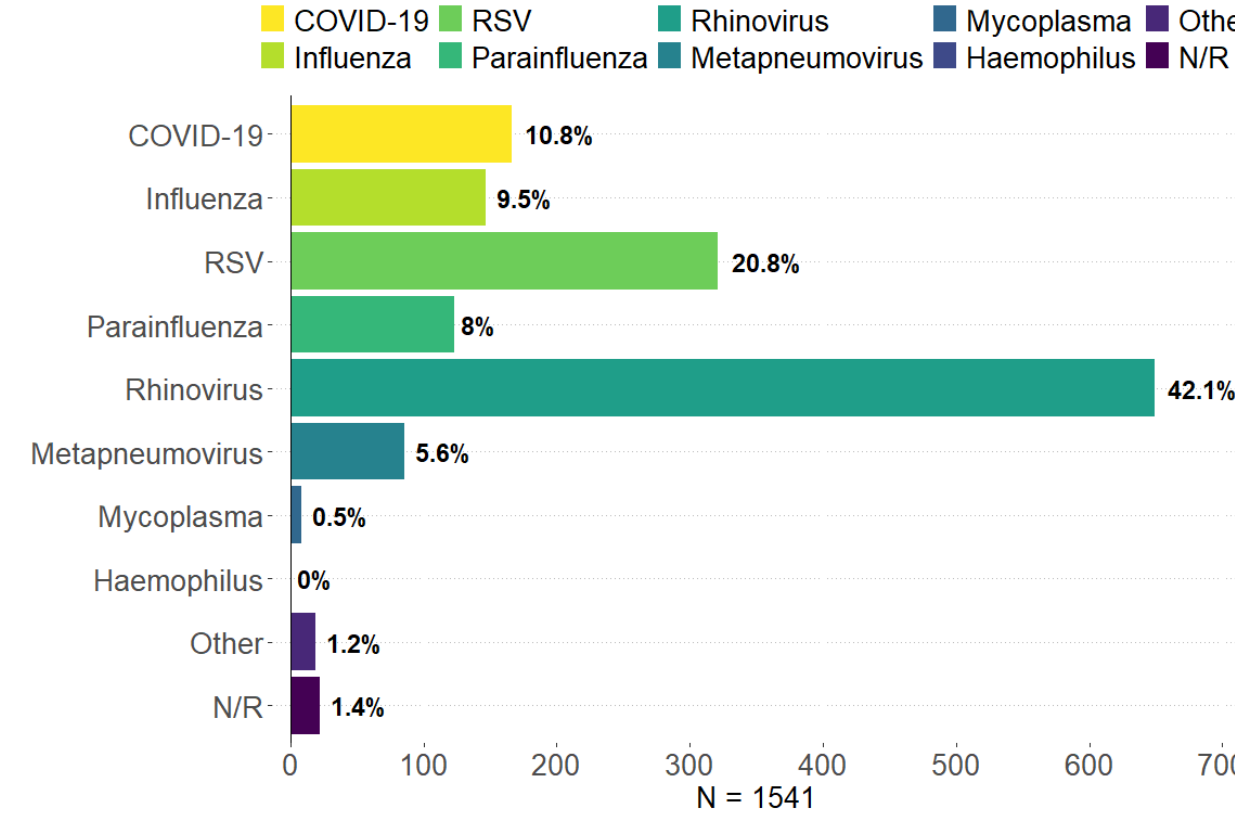
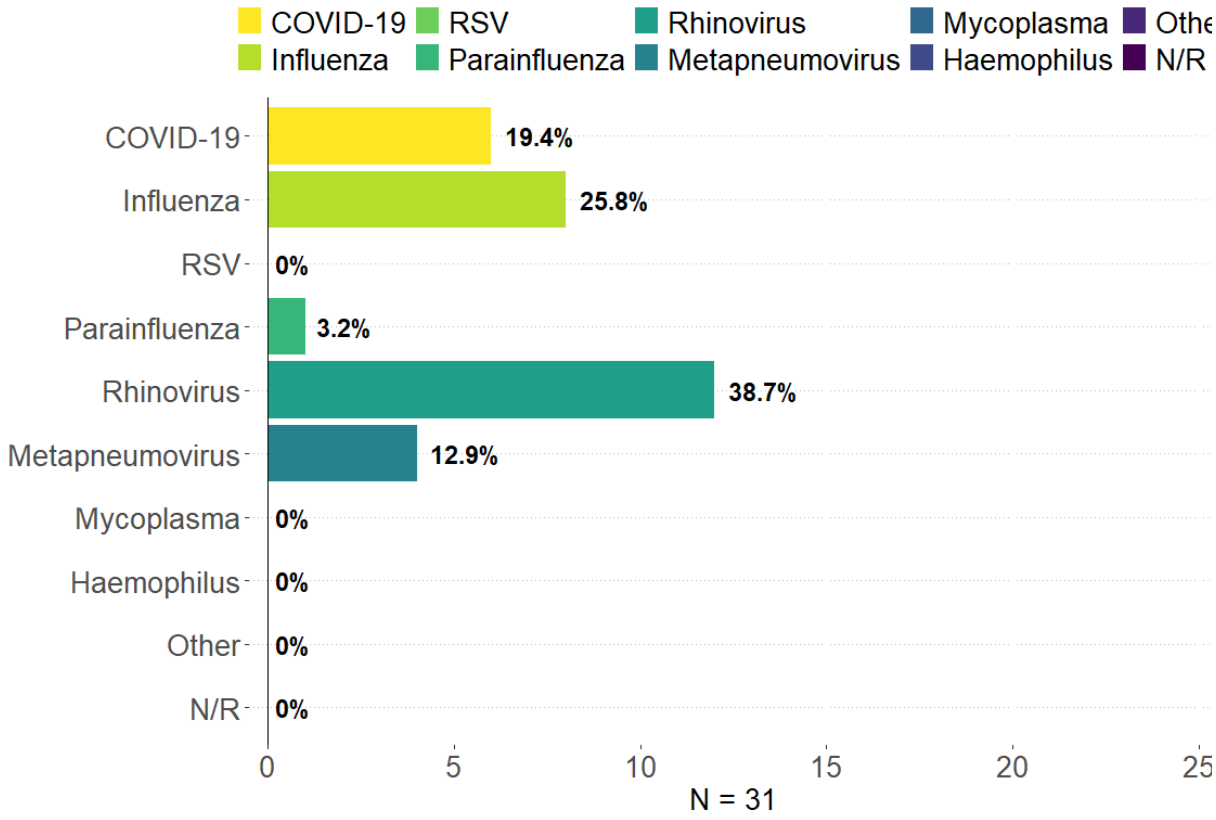


Figure 29. Mortalities of Paediatric Patients admitted to ICU with SARI, by Pathogen type

Numbers of deaths in ICU of Paediatric patients admitted with SARI, by initial pathogen
Death may not be attributable to the diagnosed pathogen and may have been from other causes.



Acknowledgements

Participating sites

State	Site	State	Site
ACT	Canberra Hospital	SA	Lyell McEwin
NSW	Bankstown-Lidcombe Hospital	SA	Adelaide Women's and Children's Hospital
NSW	Calvary Mater Newcastle	TAS	Launceston Hospital
NSW	Campbelltown Hospital	TAS	Royal Hobart Hospital
NSW	Children's Hospital at Westmead	VIC	Angliss Hospital
NSW	Concord Hospital	VIC	Austin Hospital
NSW	John Hunter Hospital	VIC	Barwon Health
NSW	Lismore Base Hospital	VIC	Bendigo Hospital
NSW	Liverpool Hospital	VIC	Box Hill Hospital
NSW	Nepean Hospital	VIC	Cabrini Hospital
NSW	Prince of Wales Hospital	VIC	Casey Hospital
NSW	Royal North Shore Hospital	VIC	Dandenong Hospital
NSW	Royal Prince Alfred Hospital	VIC	Epworth Richmond
NSW	St George Hospital	VIC	Footscray Hospital (Western Health)
NSW	St Vincent's Hospital Sydney	VIC	Frankston Hospital
NSW	Sydney Children's Hospital, Randwick	VIC	Grampians Health (Prev Ballarat Base Hospital)
NSW	Westmead Hospital	VIC	Maroondah Hospital
NSW	Wollongong Hospital	VIC	Mildura Base Hospital
NSW	Shoalhaven District Memorial Hospital	VIC	Monash Children's Hospital
NT	Royal Darwin Hospital	VIC	Monash Medical Centre
NT	Alice Springs Hospital	VIC	Northeast Health Wangaratta
QLD	Bundaberg Hospital	VIC	Royal Children's Hospital
QLD	Caboolture Hospital	VIC	Royal Melbourne Hospital
QLD	Cairns Hospital	VIC	St Vincent's Hospital Melbourne
QLD	Gold Coast University Hospital	VIC	Sunshine Hospital (Western Health)
QLD	Hervey Bay Hospital	VIC	The Alfred Hospital
QLD	Ipswich Hospital	VIC	The Northern Hospital
QLD	Logan Hospital	VIC	Warrnambool Base Hospital
QLD	Mater Misericordiae Limited	VIC	Werribee Mercy Hospital
QLD	Princess Alexandra Hospital	WA	Bunbury Hospital
QLD	Queensland Children's Hospital	WA	Fiona Stanley Hospital
QLD	Redcliffe Hospital	WA	Joondalup Health Campus
QLD	Royal Brisbane and Women's Hospital	WA	Perth Children's Hospital
QLD	Sunshine Coast University Hospital (ICU and PCCU)	WA	Royal Perth Hospital
QLD	The Prince Charles Hospital	WA	Rockingham General Hospital
QLD	Toowoomba Hospital	WA	Sir Charles Gairdner Hospital
SA	The Queen Elizabeth Hospital	WA	St John of God Midland
SA	Flinders Medical Centre	WA	St John of God Murdoch
SA	Royal Adelaide Hospital		

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