Epidemiology of intensive care admissions in cases of COVID-19 (aged 15 years and older) in Ireland in 2022

Report prepared by HPSC on 08/05/2023

The following report provides data on cases (aged 15 years and older) with laboratory confirmed COVID-19 who have been admitted to ICU during 2022 (Week 1 to Week 52) and notified to the Computerised Infectious Disease Reporting system (CIDR) at HPSC, as of midnight on 08/05/2023.

Additional reports on COVID-19 ICU surveillance can be found here. Data are provisional and subject to ongoing review, validation, and update. As a result, figures in this report may differ from previously published figures.

Please note this report only includes cases reported to HPSC who are in ICU primarily for the treatment of COVID and does not include cases in ICU for other clinical conditions which have an incidental finding of COVID-19.

Key Points: Admission to ICU in 2022 (15 years and older)

Numbers

- There were 390 admissions to ICU in people where COVID-19 disease was reported as the primary reason for admission.
- The number of admissions was highest in January 2022 (n=110).

Age and Sex

- 57% of people admitted to ICU were male, giving a male to female ratio of 1.3:1.
- The majority of admissions to ICU (86%) were in people aged between 45 and 85 years.
- The median age at time of admission to ICU was 67 years (range: 17-97 years).

Underlying Medical Conditions

- The majority (89%) of those admitted to ICU had at least one underlying medical condition.
- In those with an underlying condition, the most frequently seen conditions were hypertension (49%); chronic respiratory disease (35%); chronic heart disease (32%); diabetes mellitus (25%).
- There were three admissions to ICU in pregnant women and in women ≤6 weeks post-partum.

Clinical Complications

- The most frequently reported clinical complications during ICU stay were primary viral pneumonia (71%) and acute respiratory distress syndrome (45%).

Ventilation

- Of those admitted to ICU, 45% were invasively ventilated (44.5% conventional mechanical ventilation, 0.5% ECMO).

Outcome

- Of those admitted to ICU, 59% were discharged alive and 41% died.
- Of those who died (n=160), 140 patients were reported as having died in ICU and 20 died following transfer from ICU to a ward or high dependency unit.
- The proportion who died was highest among those aged 65-74 years (52%).

Length of Stay

- For those discharged alive, the median length of stay in ICU was 6 days (range 1-93 days).
- For those who died, the median length of stay in ICU was 9 days (range 1-119 days)

Acknowledgements

The Intensive Care Society of Ireland (ICSI) and the HSE Critical Care Programme support the provision of data by hospitals on all critical care patients with COVID-19 to HPSC. The HPSC processes and reports on this information on behalf of the regional Directors of Public Health/Medical Officers of Health. Sincere thanks are extended to all those who are participating in the collection of these data. This includes staff in ICU units, the HSE COVID-19 Contact Management Programme (CMP), notifying clinicians, laboratory staff, public health doctors, nurses, surveillance scientists, microbiologists and administrative staff. Sincere thanks are also extended to the staff at the National Office of Clinical Audit for the daily provision of data on ICU admissions and discharges.

1.0 Summary of cases of COVID-19 admitted to ICU

There were 390 people with COVID-19 disease admitted to ICU during 2022. Table 1 and Figure 1 provide a summary of these cases.

Table 1: Summary of cases (aged 15 years and older) of COVID-19 admitted to ICU in Ireland, 2022[1] [2] [3]

		Number	Percentage
Total number of cases admitted to ICU		390	100.0
Total number of cases discharged alive		230	59.0
Deaths in ICU cases		160	41.0
Route of admission	Ward	240	61.5
	Emergency Department	129	33.1
	Other hospital - ICU	4	1.0
	Other hospital - non ICU	15	3.8
Sex and age	Male:female ratio	1.3:1	-
	Median age (years)	67	-
	Age range (years)	17 - 97	-
	15-24	4	1
	25-34	20	5.1
	35-44	15	3.8
	45-54	44	11.3
	55-64	75	19.2
	65-74	128	32.8
	75-84	87	22.3
	85+	17	4.4
Underlying medical conditions	Those with underlying medical conditions (%)	346	88.7
Illness severity (at time of admission)	Acute Respiratory Distress Syndrome (ARDS)	162	41.5
	Require non-invasive mechanical ventilation	183	46.9
	Require invasive mechanical ventilation	116	29.7
	Require renal replacement therapy	29	7.4
Clinical complications reported during ICU stay (at time of discharge in those who have been discharged)	Primary viral pneumonia	277	71.0
	Secondary bacterial pneumonia	144	36.9
	Acute respiratory distress syndrome (ARDS)	176	45.1
	Acute kidney injury	112	28.7
	Sepsis	133	34.1
	Multi-organ failure	83	21.3
Type of ventilation reported during ICU stay (at time of discharge in those who have been discharged)	Biphasic intermittent positive airway pressure (BiPAP)	114	29.2
	Continuous positive airway pressure (CPAP)	125	32.1
	Conventional mechanical ventilation	173	44.4
	High frequency oscillatory ventilation (HFOV)	6	1.5
	ECMO	2	0.5
Length of stay for those discharged alive	Median (days)	6	-
	Range (days)	1 - 93	-
Length of stay for those who have died	Median (days)	9	-
	Range (days)	1 - 119	-

[1] For illness severity and clinical complications, more than one option can be selected so percentages will add to over 100%
[2] For clinical complications, the denominator is those who have been discharged from ICU
[3] Length of stay for those discharged alive refers to duration of stay after final discharge from ICU. Length of stay reflects the cumulative duration of stay, where applicable, for patients with more than one ICU admission.

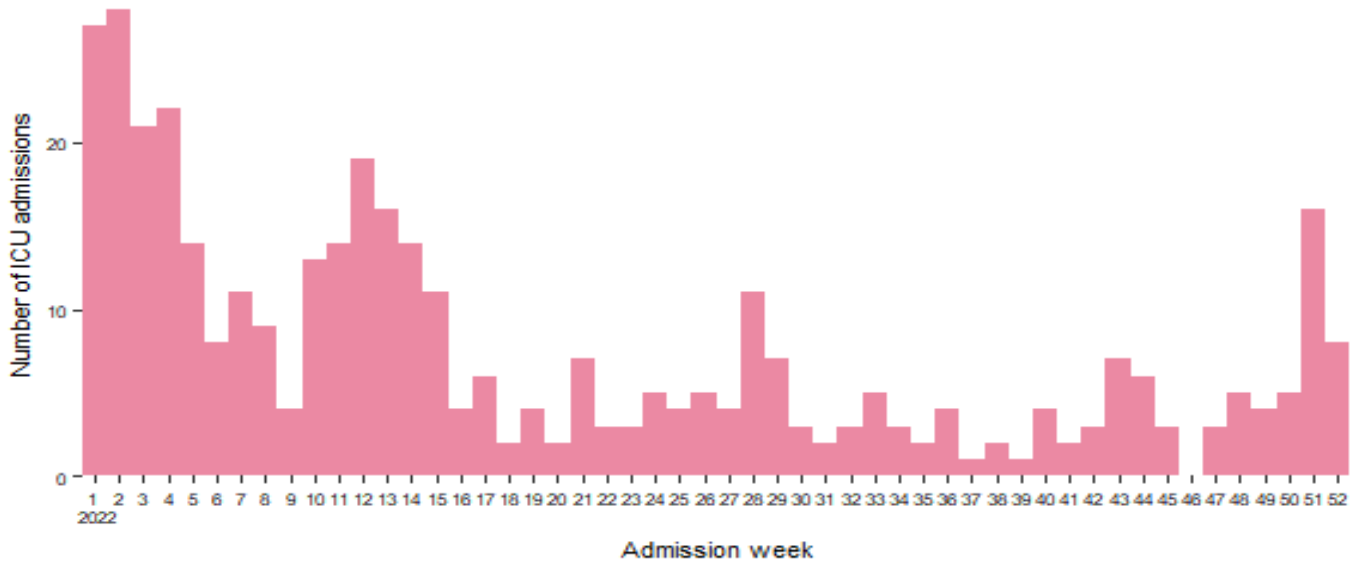

Figure 1: Cases of COVID-19 (aged 15 years and older) admitted to ICU by week of admission in Ireland (2022) [4] [5]

2.0 Age and sex distribution of cases of COVID-19 admitted to ICU

Of the admissions to ICU in 2022 (aged 15 years and over), 57% were male and 43% were female, giving a male: female ratio of 1.3:1. The mean age at time of admission to ICU was 64 years and the median age was 67 years (IQR: 56-75 years; range: 17-97 years).

Table 2 describes the sex and age distribution of cases of COVID-19 admitted to ICU. Figure 2 shows a graph of cases of COVID-19 admitted to ICU by week of ICU admission, stratified by age group.

Table 2: Cases of COVID-19 (aged 15 years and older) admitted to ICU by sex and age group, Ireland (2022)

	Female		Male		Total		
Age group (yrs)	**(n)**	**(%)**	**(n)**	**(%)**	**(n)**	**(%)**	**Rate per 100,000 population**
15-24	1	0.6	3	1.4	4	1.0	0.7
25-34	11	6.5	9	4.1	20	5.1	3.0
35-44	6	3.6	9	4.1	15	3.8	2.0
45-54	18	10.7	26	11.7	44	11.3	7.0
55-64	31	18.5	44	19.8	75	19.2	14.7
65-74	61	36.3	67	30.2	128	32.8	34.3
75-84	30	17.9	57	25.7	87	22.3	44.3
85+	10	6.0	7	3.2	17	4.4	25.2
Total	**168**	**100.0**	**222**	**100.0**	**390**	**100.0**	**10.4**

[4] See technical notes for more information on dates for which week numbers correspond
[5] For cases with multiple ICU admissions, the date of first admission to ICU is presented

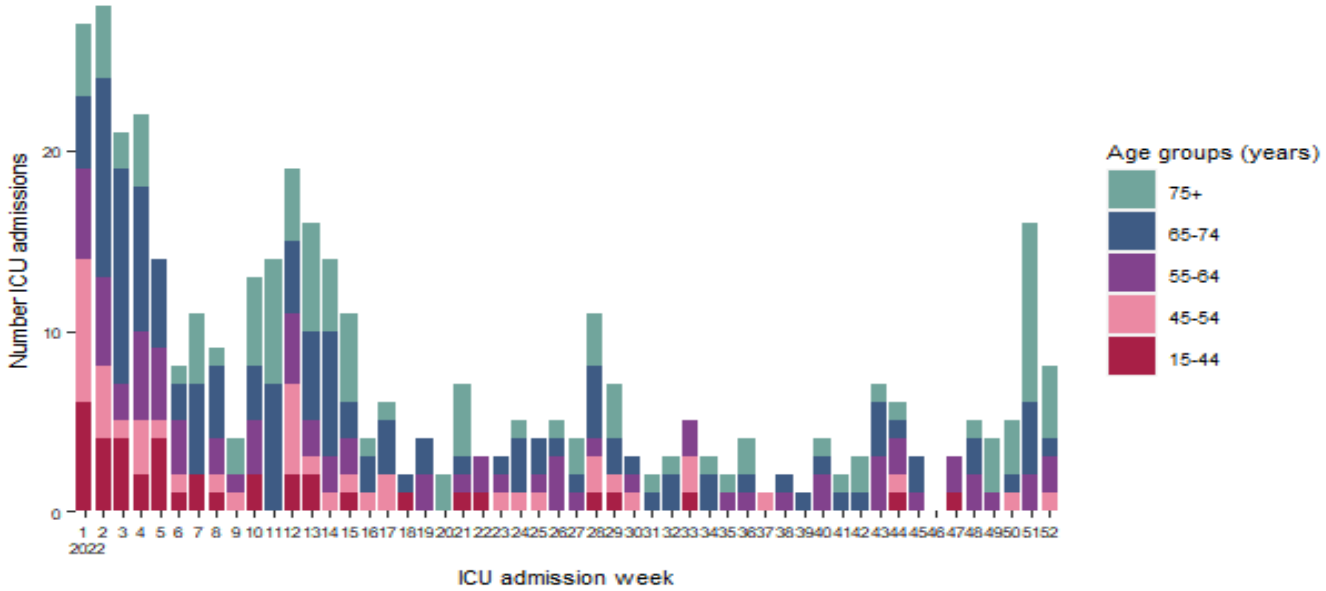

Figure 2: Cases of COVID-19 (aged 15 years and older) admitted to ICU by week of admission in Ireland, stratified by age group [6] (2022)

3.0 Underlying medical conditions at time of admission to ICU

Table 3 describes the underlying medical conditions in cases of COVID-19 at time of first admission to ICU in Ireland.

There are 3 confirmed cases of COVID-19 reported among pregnant women or women ≤6 weeks post-partum in 2022 (17% of female cases aged 15-44 years).

[6] See technical notes for more information on dates for which week numbers correspond

Table 3: Underlying medical conditions in cases of COVID-19 (aged 15 years and older) at time of admission to ICU, Ireland (2022) [7]

Underlying medical conditions	Number	Total admissions
One or more underlying clinical conditions	346	88.7
No underlying medical conditions	44	11.3
	Number	**Those with underlying illness**
Chronic heart disease	111	32.1
Hypertension	168	48.6
Chronic kidney disease	61	17.6
Chronic liver disease	18	5.2
Chronic neurological disease	42	12.1
Cancer malignancy	76	22
Immunodeficiency including HIV	77	22.3
Immunodeficiency due to HIV	3	0.9
Immunodeficiency due to solid organ transplant	17	4.9
Immunodeficiency due to therapy	57	16.5
Chronic respiratory disease	122	35.3
Chronic obstructive pulmonary disease	78	22.5
Bronchiectasis	9	2.6
Cystic fibrosis	0	0.0
Interstitial lung fibrosis	8	2.3
Asthma (requiring medication)	36	10.4
Severe asthma	1	0.3
Mild to moderate asthma	23	6.6
Pregnant	1	0.3
≤6 weeks post-partum	2	0.6
Obesity (BMI ≥40)	19	5.5
Diabetes	87	25.1
Type 1	14	4.0
Type 2	69	19.9
Gestational diabetes	0	0
Type unspecified	4	1.2
Haemoglobinopathy	5	1.4
Alcohol related disease	25	7.2

[7] More than one option can be selected for underlying condition so percentages will add to greater than 100%

4.0 Outcome for cases of COVID-19 admitted to ICU

Of the 390 cases (aged 15 years and older) admitted to ICU in 2022, 230 were discharged alive (59% of total patients admitted to ICU) and 160 died (41% of total patients admitted to ICU). Of those who died, 140 patients were reported as having died in ICU and 20 died following transfer from ICU to a ward or high dependency unit.

Table 4 describes the profile of patients with COVID-19 who have either been discharged alive from ICU or died in/post admission to ICU.

Figure 3 describes the percentage of cases who have died by age group, sex and presence of underlying medical conditions.

Table 4: Profile of cases of confirmed COVID-19 (aged 15 years and older) who were discharged alive from or died in/post admission to ICU in Ireland (2022)

		Discharged alive		Died		
		Number of cases	Percentage	Number of cases	Percentage	Total
Age group (years)	15-44	35	89.7	4	10.3	39
	45-54	32	72.7	12	27.3	44
	55-64	48	64.0	27	36.0	75
	65-74	61	47.7	67	52.3	128
	75+	54	51.9	50	48.1	104
Sex	Male	121	54.5	101	45.5	222
	Female	109	64.9	59	35.1	168
Underlying conditions	Yes	193	55.8	153	44.2	346
	No	37	84.1	7	15.9	44

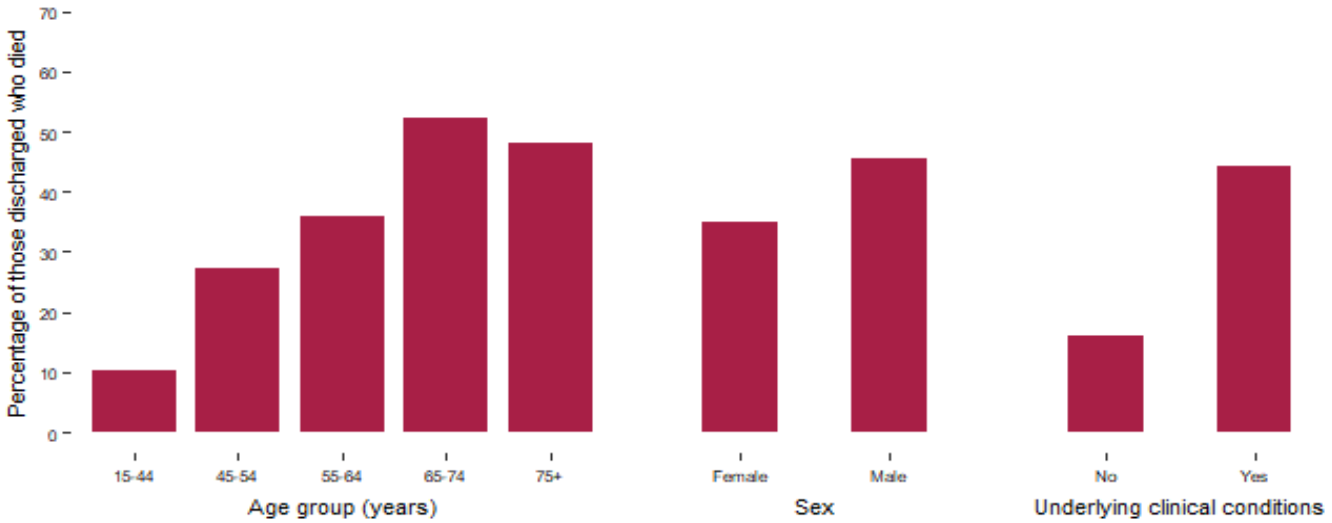

Figure 3: Profile of cases of confirmed COVID-19 (aged 15 years and older) who died in/post admission to ICU in Ireland (2022)

4.1 Clinical complications among those discharged from ICU

Discharge information has been received for 390 patients: 230 were discharged alive and 160 died.

Table 5 describes the clinical complications reported for cases of COVID-19 at the time of discharge from ICU (includes information reported upon discharge, for those discharged to another ICU).

Table 5: Clinical complications and outcome of cases of COVID-19 (aged 15 years and older) at time of discharge from ICU, Ireland (2022) [8]

	Number	
Total number of cases discharged from ICU	**390**	**100.0**
Complications/illness during ICU stay	**Number**	**Of those discharged**
Primary viral pneumonia	277	71.0
Secondary bacterial pneumonia	144	36.9
Acute respiratory distress syndrome (ARDS)	176	45.1
Pressor dependence during ICU stay	196	50.3
Myocarditis	10	2.6
Encephalitis	4	1.0
Sepsis	133	34.1
Multi-organ failure	83	21.3
Anti-coagulation for thrombotic event	38	9.7
Treatment acute kidney injuries (AKI)		
Acute kidney injury	112	28.7
Received CRRT/IHD	64	16.4
Use of ventilation during ICU stay		
Yes	294	75.4
No	96	24.6
Type of ventilations		
Biphasic intermittent positive airway pressure (BiPAP)	114	29.2
Continuous positive airway pressure (CPAP)	125	32.1
Conventional (including lung protective) mechanical ventilation	173	44.4
High frequency oscillatory ventilation (HFOV)	6	1.5
Required ECMO	2	0.5

[8] More than one option can be selected for clinical complications so percentages will add to greater than 100%

5.0 Admission activity by location

Table 6 describes the distribution of cases of COVID-19 admitted to ICU in Ireland by HSE area of residence.

Table 6: Area of residence of cases of COVID-19 (aged 15 years and older) admitted to ICU[9], Ireland (2022)

HSE area	Number of cases	Percentage	Rate per 100,000 population
East	151	38.7	8.8
Midlands	38	9.7	13.0
Mid-West	20	5.1	5.2
North-East	50	12.8	10.8
North-West	19	4.9	7.4
South-East	32	8.2	6.3
South	44	11.3	6.4
West	36	9.2	7.9
Total	**390**	**100.0**	**8.2**

[9] See technical notes for counties associated with each HSE area

Report prepared by Epi Team, HPSC, 08/05/2023

Further reports

Further reports on COVID-19 surveillance can be found here

Technical notes

1. Data in this report are confidential and provisional, and may change following further data validation and review. Some of the variables in the tables have missing or unknown data and ongoing validation work will improve the accuracy and completeness of the data.

2. Case definitions for COVID-19 are available

3. Deaths included in this report can be during or after ICU stay. If a person was discharged alive from ICU and is reported to have subsequently died, they will be included as died for the analysis in this report.

4. Due to the relatively low proportion of patients that have completed their critical care, all outcomes should be interpreted with caution.

5. Please note that patients whose outcome data have not been received are assumed to remain in ICU.

6. Length of stay

- Refers to duration of stay for patients after final discharge from ICU for those discharged alive from ICU (and excludes those transferred to another ICU).
- Reflects the cumulative duration of stay, where applicable, for patients with more than one ICU admission

7. HSE areas: The counties covered by each HSE area are as follows:

- HSE East (E): Dublin, Kildare & Wicklow;
- HSE Midlands (M): Laois, Longford, Offaly & Westmeath;
- HSE Midwest (MW): Clare, Limerick & N. Tipperary;
- HSE Northeast (NE): Cavan, Louth, Meath & Monaghan;
- HSE Northwest (NW): Donegal, Leitrim & Sligo;
- HSE South (S): Kerry & Cork;
- HSE Southeast (SE): Carlow, Kilkenny, S. Tipperary, Waterford & Wexford;
- HSE West (W): Galway, Mayo & Roscommon.

9. Information on the epidemiological weeks can be found here