



Wave 3: Epidemiology of intensive care admissions in cases of COVID-19 in Ireland (among those aged 15 years and older)

Report prepared by HPSC on 02.11.2021

The following report provides data on cases (aged 15 years and older) with confirmed COVID-19 who have been admitted to ICU during Wave 3 of the COVID-19 pandemic in Ireland (22.11.2020 – 26.06.2021) and notified to the Computerised Infectious Disease Reporting system (CIDR) at HPSC.

Key Points: Admissions to ICU in Wave 3

- Nine hundred and seventy-two (aged 15 years and older) people with confirmed COVID-19 infection were admitted to ICU
- Sixty one percent (594) of cases were male.
- The median age of cases was 62 years (range 15-91 years).
- Ninety percent of cases had underlying medical conditions. The most commonly reported underlying medical conditions were: hypertension (50%); chronic heart disease (36%); chronic respiratory disease (33%); and diabetes mellitus (27%).
- Fifty-four percent of cases required conventional mechanical ventilation during their stay in ICU.
- Eighty three percent of cases had primary viral pneumonia, 68% had acute respiratory distress syndrome and 34% had sepsis during their stay in ICU.
- Sixty one percent of cases were discharged alive and the median length of stay in ICU for those who were discharged alive was 9 days (range 1-163 days).
- Three hundred and seventy-five people (39%) died and the median length of stay in ICU for those who died was 14 days (range 1-127 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 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

During wave 3 of the COVID-19 pandemic in Ireland, 972 cases (aged 15 years and older) with confirmed COVID-19 were reported to HPSC as being admitted to ICU. Table 1 provides a summary of these admissions.

Table 1. Summary of cases of COVID-19 (aged 15 years and older) admitted to ICU in Ireland^{1 2} (Wave 3)

		n	%
Total number of cases admitted to ICU		972	100.0
Total number of cases discharged alive		597	61.4
Deaths in ICU cases to date		375	38.6
Route of Admission	Ward	731	75.2
	Emergency Department	213	21.9
	Other Hospital - ICU	2	0.2
	Other Hospital - non ICU	16	1.6
Sex & Age	Male:Female Ratio	1.6:1	-
	Median Age (years)	62	-
	Age Range (years)	15 - 91	-
	15-24 years	16	1.6
	25-34 years	36	3.7
	35-44 years	80	8.2
	45-54 years	178	18.3
	55-64 years	257	26.4
	65-74 years	260	26.7
	75-84 years	132	13.6
	85+ years	13	1.3
Underlying medical conditions	Those with underlying medical condition (%)	879	90.4
Illness severity (at time of admission)	Acute Respiratory Distress Syndrome (ARDS)	631	64.9
	Require non-invasive mechanical ventilation	653	67.2
	Require invasive mechanical ventilation	296	30.5
	Require Renal Replacement therapy	39	4.0
Clinical complications reported during ICU stay (at time of discharge in those who have been discharged)	Primary viral pneumonia	807	83.0
	Secondary bacterial pneumonia	305	31.4
	Acute Respiratory Distress Syndrome (ARDS)	657	67.6
	Acute kidney injury	228	23.5
	Sepsis	329	33.8
	Multi-organ failure	53	5.5
Type of ventilation reported during ICU stay (at time of discharge in those who have been discharged)	Biphasic intermittent positive airway pressure (BiPAP)	334	34.4
	Continuous positive airway pressure (CPAP)	454	46.7
	Conventional mechanical ventilation	525	54.0
	High frequency oscillatory ventilation (HFOV)	9	0.9
	ECMO	16	1.6
Length of stay for those discharged alive	Median (days); IQR (days)	9	-
	Range (days)	1 - 163	-
Length of stay for those who have died	Median (days); IQR (days)	14	-
	Range (days)	1 - 127	-

¹ For illness severity and clinical complications, more than one option can be selected so percentages will add to over 100%.

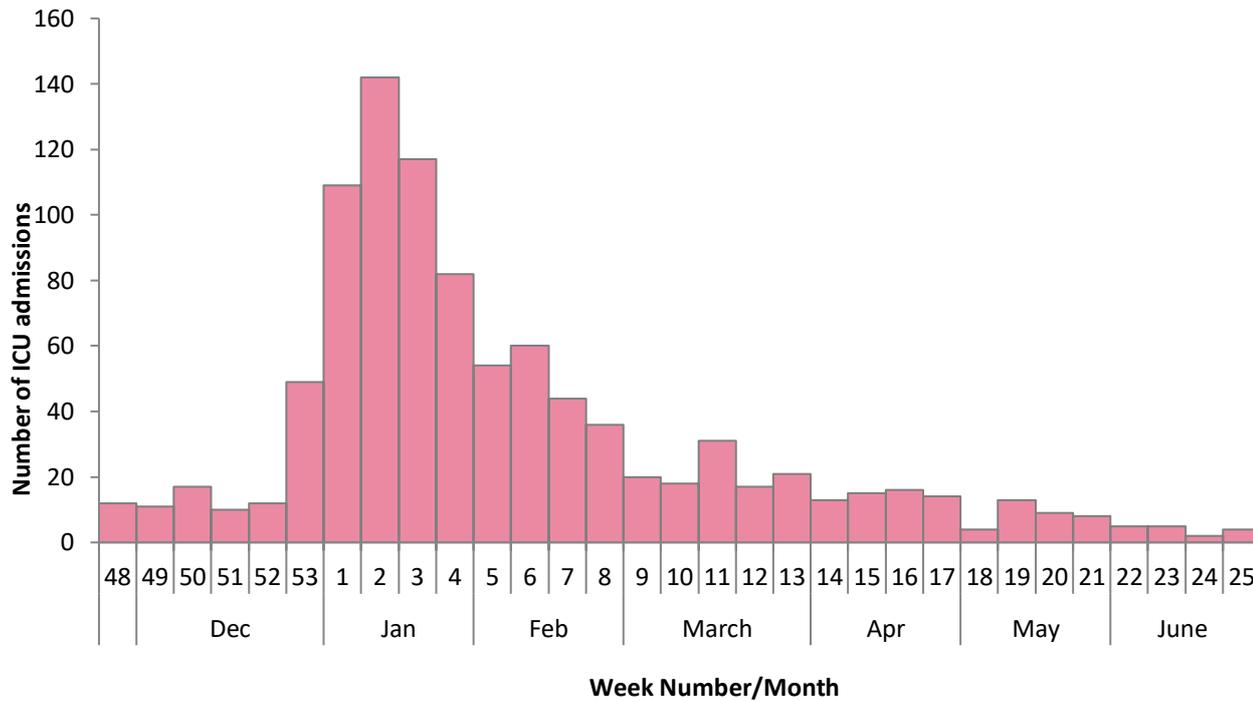
² Length of stay for those discharged alive refers to duration of stay after final discharge from ICU. Length of stay reflects the cumulative duration of stay, where applicable, for patients with more than one ICU admission.

2.0 Admission of cases of COVID-19 to ICU

2.1 Date of admission to ICU

A graph of cases of COVID-19 by week of admission to ICU in Wave 3 is shown in figure 1.

Figure 1. COVID-19 cases (aged 15 years and older) admitted to ICU by week of admission in Ireland (Wave 3)^{3 4}



³ See technical notes for more information on dates for which week numbers correspond

⁴ For cases with multiple ICU admissions, the date of first admission to ICU is presented

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

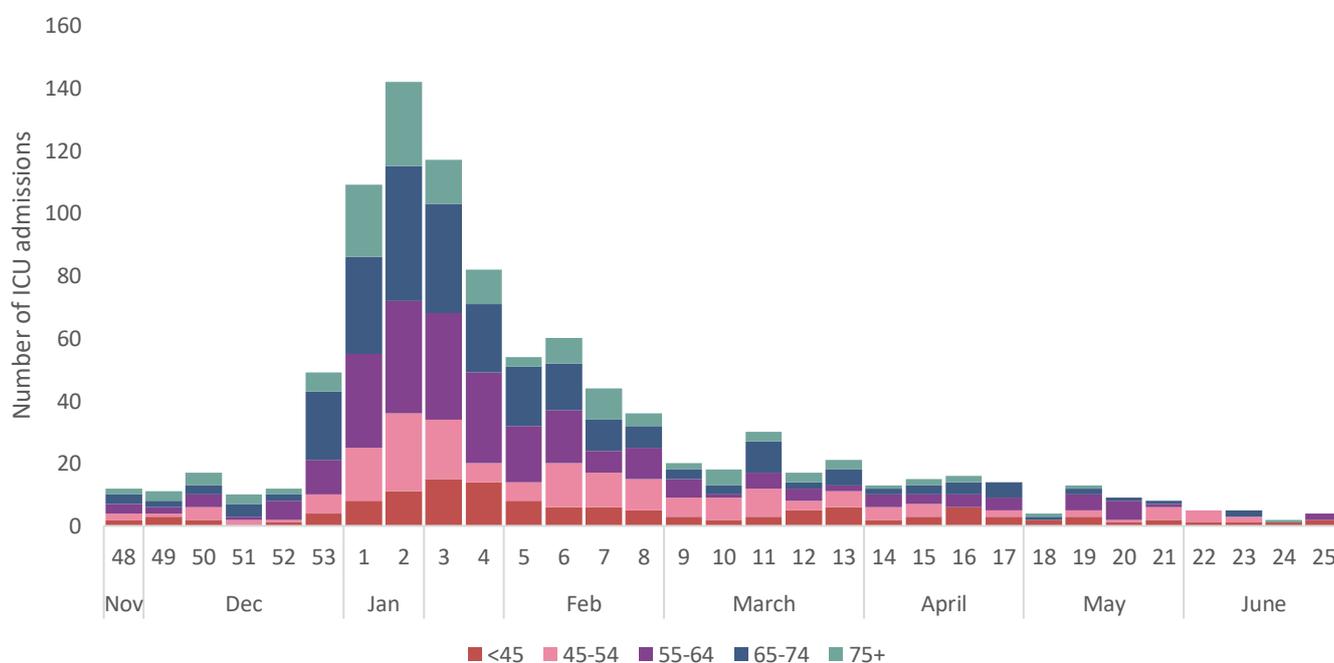
Of the 972 admissions to ICU during wave 3, 61% were male and 39% were female, giving a male: female ratio of 1.6:1. The mean age at time of admission to ICU was 60 years and the median age was 62 years (IQR: 51-70 years; Range: 15-91 years).

Table 2 describes the sex and age distribution of cases of COVID-19 admitted to ICU during wave 3. 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 (Wave 3)

	Female		Male		Total		Rate per 100,000 population
	n	%	n	%	n	%	
15-24	11	2.9	5	0.8	3	0.3	2.8
25-34	19	5.0	17	2.9	2	0.2	5.5
35-44	37	9.8	43	7.2	14	1.4	10.7
45-54	64	16.9	114	19.2	19	2.0	28.4
55-64	98	25.9	159	26.8	32	3.3	50.5
65-74	95	25.1	165	27.8	70	7.2	69.6
75-84	49	13.0	83	14.0	28	2.9	67.2
≥85	5	1.3	8	1.3	2	0.2	19.2
Total	378	100.0	594	100.0	972	100.0	25.9

Figure 2. Cases of COVID-19 (aged 15 years and older) admitted to ICU by week of admission, stratified by age group (Wave 3)⁵



⁵ See Appendix A for more information on dates for which week numbers correspond

2.3 Underlying medical conditions at time of admission to ICU

Table 3 describes the underlying medical conditions in cases of COVID-19 admitted to ICU during Wave 3.

Table 3: Underlying medical conditions in cases of COVID-19 (aged 15 years and older) at time of first admission to ICU, Ireland⁶ (Wave 3)

Underlying Medical Conditions	Number	% Total admissions	
One or more underlying medical conditions	879	90.4	
No underlying medical conditions	93	9.6	
	Number	% Those with underlying illness	
Chronic heart disease	312	35.5	
Hypertension	436	49.6	
Chronic kidney disease	91	10.4	
Chronic liver disease	36	4.1	
Chronic neurological disease	63	7.2	
Cancer/malignancy	132	15	
Immunodeficiency, incl HIV	91	10.4	
Chronic respiratory disease	291	33.1	
Chronic obstructive pulmonary disease	154	17.5	
Bronchiectasis	11	1.3	
Cystic fibrosis	1	0.1	
Interstitial lung fibrosis	5	0.6	
Asthma (requiring medication)	127	14.4	
Severe Asthma	5	0.6	
Mild to Moderate Asthma	76	8.6	
Pregnant	19	2.2	
<=6 weeks post-partum	7	0.8	
Obesity (BMI >=40)	116	13.2	
Diabetes mellitus	244	27.8	
	<i>Type I</i>	29	3.3
	<i>Type II</i>	183	20.8
	<i>Type unspecified</i>	32	3.6
Haemoglobinopathy	12	1.4	
Alcohol related disease	31	3.5	

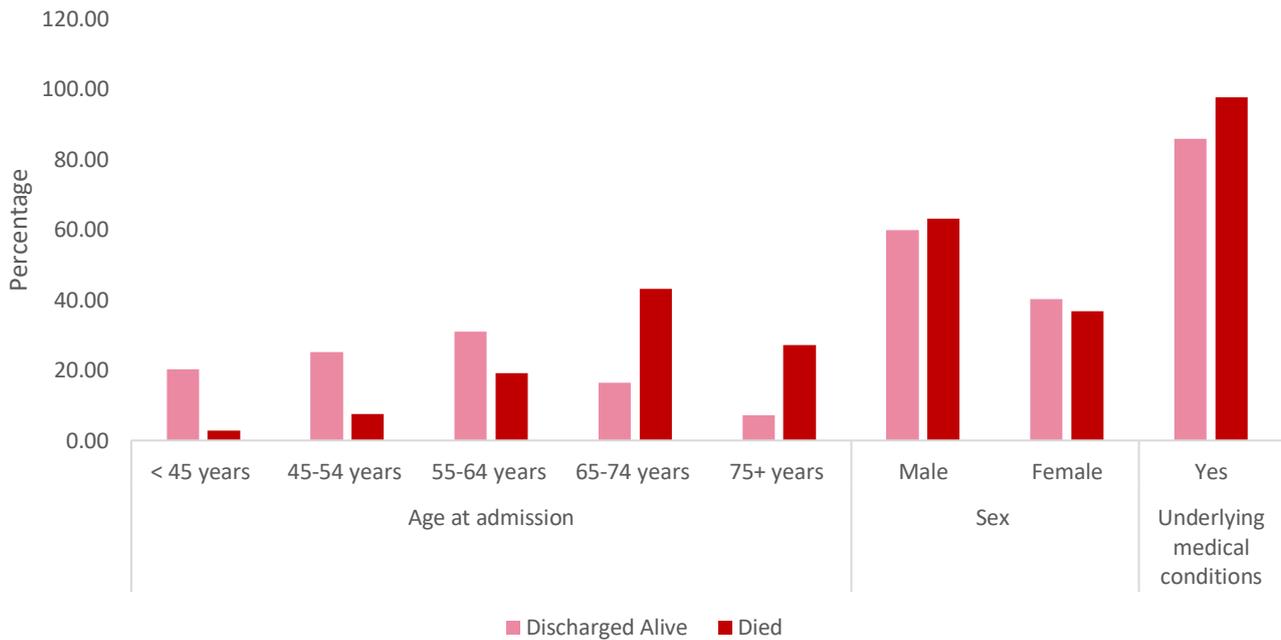
⁶ More than one option can be selected for underlying condition so percentages will add to greater than 100%

3.0 Outcome for cases of COVID-19 admitted to ICU

Of the 972 cases admitted to ICU during wave 3, 597 were discharged alive (61% of total patients admitted to ICU) and 375 died (39% of total patients admitted to ICU). Of those who died, 338 were reported as having died in ICU and 37 died following discharge from ICU.

Figure 3 describes characteristics of patients who were discharged alive or who died.

Figure 3: Profile of cases of COVID-19 (aged 15 years and older) who were discharged alive from or died in/post admission to ICU in Ireland (Wave 3)



3.2 Clinical complications among those discharged from ICU

Table 4 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 4: Clinical complications and outcome of cases of COVID-19 (aged 15 years and older) at time of discharge from ICU, Ireland ⁷ (Wave 3)

Complications/Illness during ICU stay	Number	% of those discharged
Primary viral pneumonia	807	83.0
Secondary bacterial pneumonia	305	31.4
Acute respiratory distress syndrome (ARDS)	657	67.6
Pressor dependence during ICU stay	503	51.7
Myocarditis	19	2.0
Encephalitis	9	0.9
Sepsis	329	33.8
Multi-organ failure	53	5.5
Anti-coagulation for thrombotic event	116	11.9
Treatment Acute Kidney Injuries (AKI)	Number	% of those discharged
Acute kidney injury	228	23.5
Received CRRT/IHD	142	14.6
Use of ventilation or intervention during ICU stay	Number	% of those discharged
Yes	852	87.7
No	120	12.3
Type of Ventilation	Number	% of those discharged
Biphasic intermittent positive airway pressure (BiPAP)	334	34.4
Continuous positive airway pressure (CPAP)	454	46.7
Conventional (including lung protective) mechanical ventilation	525	54.0
High frequency oscillatory ventilation (HFOV)	9	0.9
Required ECMO	16	1.6

⁷ More than one option can be selected for clinical complications so percentages will add to greater than 100%.

4.0 Admission activity by location

Table 5 describes the distribution of cases of COVID-19 admitted to ICU in Ireland by HSE area of residence.

Table 5: Cases of COVID-19 admitted to ICU by HSE area of residence⁸, Ireland (Wave 3)

HSE Area	n	%	Rate per 100,00 population
East	374	38.5	21.8
Midlands	81	8.3	27.7
Mid-West	48	4.9	12.5
North-East	98	10.1	21.3
North-West	71	7.3	27.5
South	81	8.3	11.7
South East	106	10.9	20.8
West	113	11.6	24.9
Total	972	100.0	20.4

⁸ See technical notes for counties associated with each HSE area

Technical Notes

1. Data in this report are 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. 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.
3. Please note that patients whose outcome data have not been received are assumed to remain in ICU.
4. Length of stay
 - a. 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).
 - b. Reflects the cumulative duration of stay, where applicable, for patients with more than one ICU admission.
5. 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.
6. Further information on the Epidemiological weeks for the 2020/2021 can be found here: <https://www.hpsc.ie/notifiablediseases/resources/epidemiologicalweeks/>

Further information

Further reports on COVID-19 surveillance can be found at <https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/surveillance/>

Case definitions

Case definitions for COVID-19 are available <https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/casedefinitions/>