



Wave 1: 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) with confirmed COVID-19 who have been admitted to ICU during Wave 1 of the COVID-19 pandemic in Ireland (16.02.2020 – 01.08.2020) and notified to the Computerised Infectious Disease Reporting system (CIDR) at HPSC.

Key Points: Admissions in Wave 1

- Four hundred and thirty-six (aged 15 years and older) people with confirmed COVID-19 were admitted to ICU
- Sixty nine percent of cases (302) were male.
- The median age of cases was 60 years (range 17-90 years).
- Eighty eight percent of cases had underlying medical conditions. The most commonly reported underlying medical conditions were: Chronic heart disease (57%); hypertension (37%); diabetes mellitus (30%); and chronic respiratory disease (28%).
- Seventy percent of cases required conventional mechanical ventilation during their stay in ICU.
- Seventy five percent of cases had primary viral pneumonia, 72% had acute respiratory distress syndrome and 37% had sepsis during their time in ICU.
- Seventy nine percent of cases were discharged alive and the median length of stay in ICU for those who were discharged alive was 14 days (range 1-102 days).
- Twenty one percent of cases died and the median length of stay in ICU for those who died was 12.5 days (range 1-135 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 1 of the COVID-19 pandemic in Ireland, 436 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 1)

		Number	%
Total number of cases admitted to ICU		436	100
Total number of cases discharged alive		344	78.9
Deaths in ICU cases to date		92	21.1
Route of Admission	Ward	289	66.3
	Emergency Department	121	27.8
	Other Hospital - ICU	0	0.0
	Other Hospital – non-ICU	7	1.6
Sex & Age	Male:Female Ratio	2.3:1	-
	Median Age (years)	60	-
	Age Range (years)	17 - 90	-
	15-24 years	5	1.1
	25-34 years	15	3.4
	35-44 years	36	8.3
	45-54 years	91	20.9
	55-64 years	128	29.4
	65-74 years	109	25.0
	75-84 years	46	10.6
85+ years	6	1.4	
Underlying medical conditions	Those with underlying medical condition (%)	383	87.8
Illness severity (at time of admission)	Acute respiratory distress syndrome (ARDS)	272	62.4
	Require non-invasive mechanical ventilation	101	23.2
	Require invasive mechanical ventilation	264	60.6
	Require Renal Replacement therapy	40	9.2
Clinical complications reported during ICU stay (at time of discharge in those who have been discharged)	Primary viral pneumonia	328	75.2
	Secondary bacterial pneumonia	128	29.4
	Acute respiratory distress syndrome (ARDS)	312	71.6
	Acute kidney injury	145	33.3
	Sepsis	159	36.5
	Multi-organ failure	117	26.8
Type of ventilation reported during ICU stay (at time of discharge in those who have been discharged)	Biphasic intermittent positive airway pressure (BiPAP)	67	15.4
	Continuous positive airway pressure (CPAP)	75	17.2
	Conventional mechanical ventilation	307	70.4
	High frequency oscillatory ventilation (HFOV)	7	1.6
	ECMO	4	0.9
Length of stay for those discharged alive	Median (days)	14	-
	Range (days)	1 – 102	-
Length of stay for those who have died	Median (days)	12.5	-
	Range (days)	1 - 135	-

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

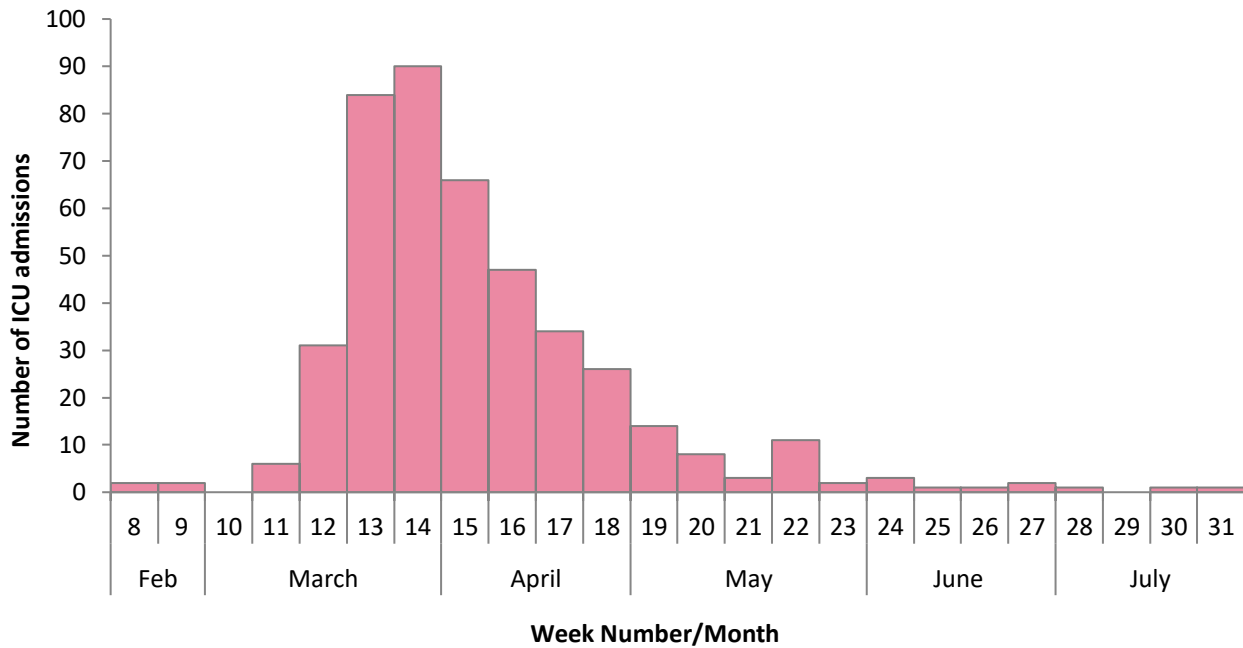
² Length of stay for those discharged alive refers to duration of stay after final discharge from ICU. Length of stay reflects the cumulative duration of stay, where applicable, for patients with more than one ICU admission.

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 1 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 1)^{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

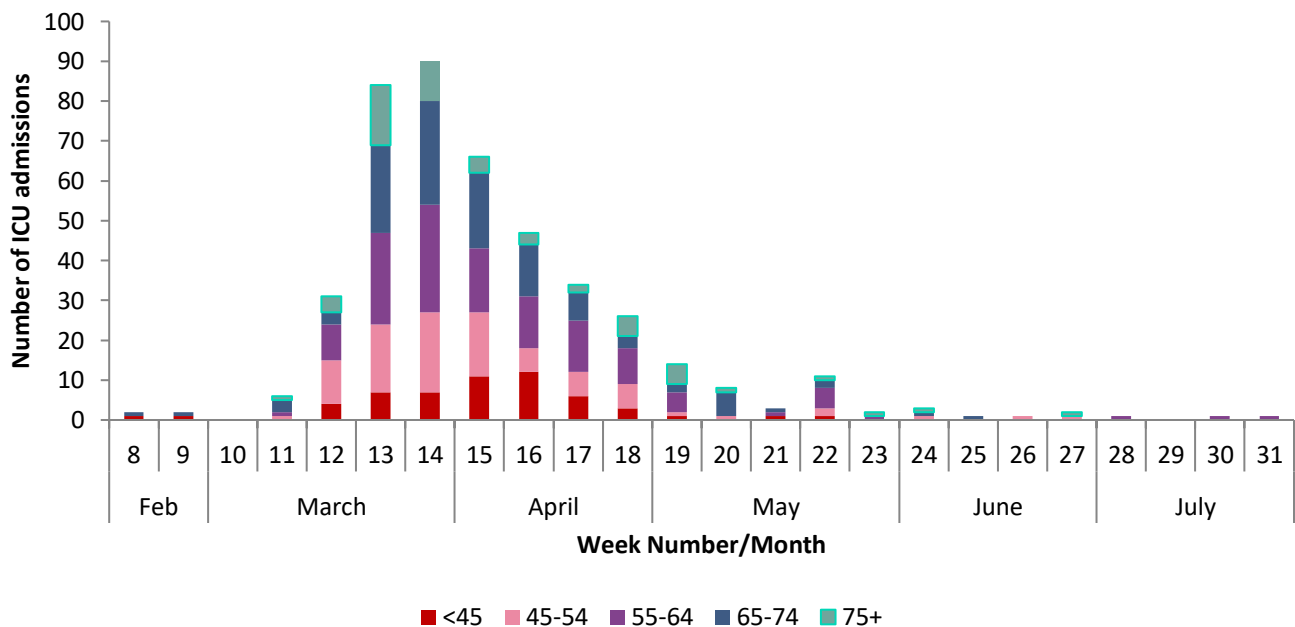
Of the 436 admissions to ICU during wave 1, 69% were male and 31% were female, giving a male: female ratio of 2.3:1. The mean age at time of admission to ICU was 59 years and the median age was 60 years (IQR: 50-69 years; Range: 17-90 years).

Table 2 describes the sex and age distribution of cases of COVID-19 admitted to ICU during wave 1. 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 1)

Age group (years)	Female		Male		Total		
	n	%	n	%	n	%	Rate per 100,000 population
15-24	3	2.2	2	0.7	3	0.7	0.9
25-34	5	3.7	10	3.3	2	0.5	2.3
35-44	9	6.7	27	8.9	14	3.2	4.8
45-54	26	19.4	65	21.5	19	4.4	14.5
55-64	39	29.1	89	29.5	32	7.3	25.1
65-74	32	23.9	77	25.5	70	16.1	29.2
75-84	18	13.4	28	9.3	28	6.4	23.4
≥85	2	1.5	4	1.3	2	0.5	8.9
Total	134	100.0	302	100.0	436	100.0	11.6

Figure 2. Cases of COVID-19 (aged 15 years and older) admitted to ICU by week of admission, stratified by age group (Wave 1)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 1 in Ireland.

Table 3: Underlying medical conditions in cases of COVID-19 (aged 15 years and older) at time of first admission to ICU, Ireland⁶ (Wave 1)

Underlying Medical Conditions	N	% Total admissions
One or more underlying medical conditions	383	87.8
No underlying medical conditions	53	12.2
Underlying Medical Conditions	N	% Those with underlying illness
Chronic heart disease	218	56.9
Hypertension	143	37.3
Chronic kidney disease	40	10.4
Chronic liver disease	14	3.7
Chronic neurological disease	19	5.0
Cancer/malignancy	52	13.6
Immunodeficiency, incl HIV	27	7.0
Chronic respiratory disease	106	27.7
Chronic obstructive pulmonary disease	43	11.2
Bronchiectasis	5	1.3
Cystic fibrosis	1	0.3
Interstitial lung fibrosis	4	1.0
Asthma (requiring medication)	50	13.1
Pregnant	1	0.3
<=6 weeks post partum	1	0.3
Obesity (BMI >=40)	80	20.9
Diabetes mellitus	114	29.8
<i>Type I</i>	14	3.7
<i>Type II</i>	88	23.0
<i>Type unspecified</i>	12	3.1
Haemoglobinopathy	2	0.5
Alcohol related disease	14	3.7

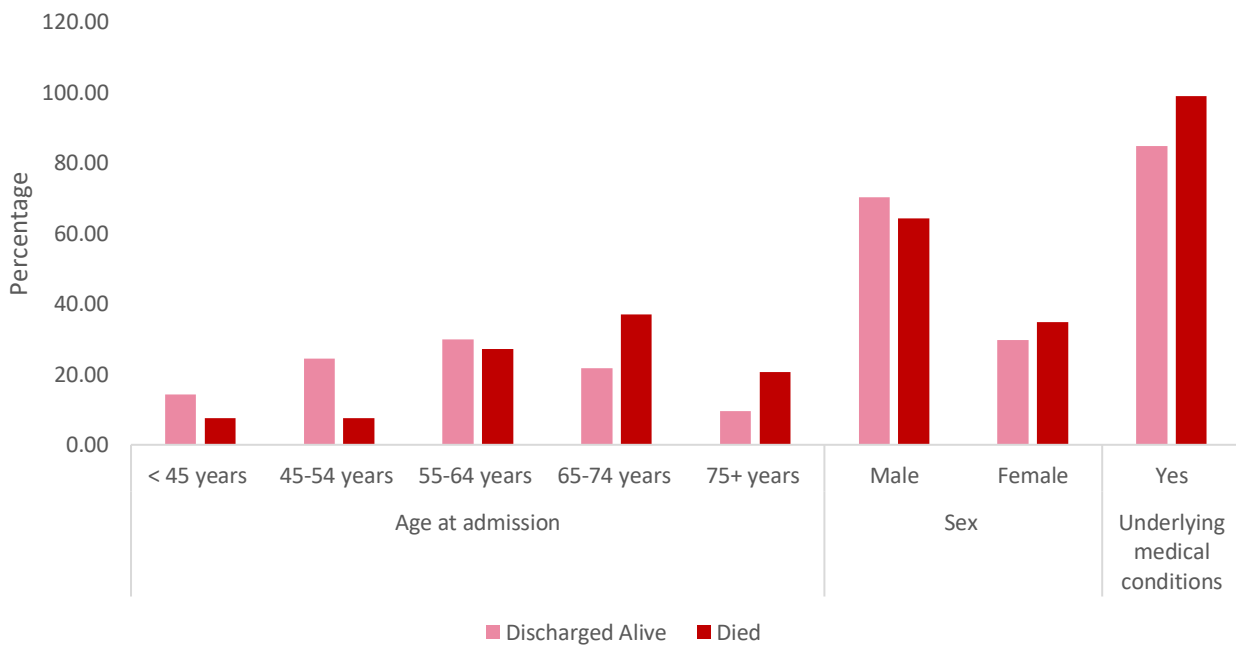
⁶ More than one option can be selected for underlying condition so percentages will add to greater than 100%

3.0 Outcome for cases of COVID-19 admitted to ICU

Of the 436 cases admitted to ICU during wave 1, 344 were discharged alive (79% of total patients admitted to ICU) and 92 died (21% of total patients admitted to ICU). Of those who died, 75 were reported as having died in ICU and 17 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 1)



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 1)

Complications/Illness during ICU stay	N	% of those discharged
Primary viral pneumonia	328	75.2
Secondary bacterial pneumonia	128	29.4
Acute respiratory distress syndrome (ARDS)	312	71.6
Pressor dependence during ICU stay	297	68.1
Myocarditis	11	2.5
Encephalitis	6	1.4
Sepsis	159	36.5
Multi-organ failure	117	26.8
Treatment Acute Kidney Injuries (AKI)	N	% of those discharged
Acute kidney injury	145	33.3
Received CRRT/IHD	105	24.1
Use of ventilation or intervention during ICU stay	N	% of those discharged
Yes	354	81.2
No	82	18.8
Type of Ventilation	N	% of those discharged
Biphasic intermittent positive airway pressure (BiPAP)	67	15.4
Continuous positive airway pressure (CPAP)	75	17.2
Conventional (including lung protective) mechanical ventilation	307	70.4
High frequency oscillatory ventilation (HFOV)	7	1.6
Required ECMO	4	0.9

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 1)

HSE Area	n	%	Rate per 100,000
East	245	56.2	14.3
Midlands	30	6.9	10.3
Mid-West	18	4.1	4.7
North-East	39	9.0	8.5
North-West	20	4.6	7.8
South	34	7.8	4.9
South East	18	4.1	3.5
West	32	7.3	7.1
Total	436	100.0	9.2

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/>