Wave 2: 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 were admitted to ICU during Wave 2 of the COVID-19 pandemic in Ireland (02.08.2020 – 21.11.2020) and notified to the Computerised Infectious Disease Reporting system (CIDR) at HPSC.

Key Points: Admissions to ICU in Wave 2

- One hundred and seventy people (aged 15 years and older) with confirmed COVID-19 infection were admitted to ICU.
- Sixty nine percent (117) of cases were male.
- The median age of cases was 67 years (range 19-87 years).
- Ninety two percent of cases had underlying medical conditions. The most commonly reported underlying medical conditions were: hypertension (52%); chronic heart disease (46%); chronic respiratory disease (40%); and diabetes mellitus (36%).
- Fifty two percent of cases required conventional mechanical ventilation during their stay in ICU.
- Seventy three percent of cases had primary viral pneumonia, 73% had acute respiratory distress syndrome and 33% had sepsis during their stay in ICU.
- Sixty five percent of cases were discharged alive and the median length of stay in ICU for those who were discharged alive was 8 days (range 1-97 days).
- Thirty five percent of cases died and the median length of stay in ICU for those who died was 17 days (range 1-90 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

During wave 2 of the COVID-19 pandemic in Ireland, 170 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 2)

		n	%
Total number of cases admitted to ICU		170	100.0
Total number of cases discharged alive		111	65.3
Deaths in ICU cases to date		59	34.7
Route of Admission	Ward	124	72.9
	Emergency Department	40	23.5
	Other Hospital - ICU	0	0.0
	Other Hospital - non ICU	3	1.8
Sex & Age	Male:Female Ratio	2.2:1	-
	Median Age (years)	67	-
	Age Range (years)	19 - 87	-
	15-24 years	3	1.8
	25-34 years	2	1.2
	35-44 years	14	8.2
	45-54 years	19	11.2
	55-64 years	32	18.8
	65-74 years	70	41.2
	75-84 years	28	16.5
	85+ years	2	1.2
Underlying medical conditions	Those with underlying medical condition	156	91.8
Illness severity (at time of admission)	Acute Respiratory Distress Syndrome (ARDS)	112	65.9
	Required non-invasive mechanical ventilation	94	55.3
	Required invasive mechanical ventilation	60	35.3
	Required Renal Replacement therapy	4	2.4
Clinical complications reported during ICU stay (at time of discharge in those who have been discharged)	Primary viral pneumonia	124	72.9
	Secondary bacterial pneumonia	52	30.6
	Acute Respiratory Distress Syndrome (ARDS)	124	72.9
	Acute kidney injury	41	24.1
	Sepsis	56	32.9
	Multi-organ failure	15	8.8
Type of ventilation reported during ICU stay (at time of discharge in those who have been discharged)	Biphasic intermittent positive airway pressure (BiPAP)	57	33.5
	Continuous positive airway pressure (CPAP)	62	36.5
	Conventional mechanical ventilation	88	51.8
	High frequency oscillatory ventilation (HFOV)	5	2.9
	ECMO	3	1.8
Length of stay for those discharged alive	Median (days)	8	-
	Range (days)	1 - 97	-
Length of stay for those who have died	Median (days)	17	-
	Range (days)	1 - 90	-

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

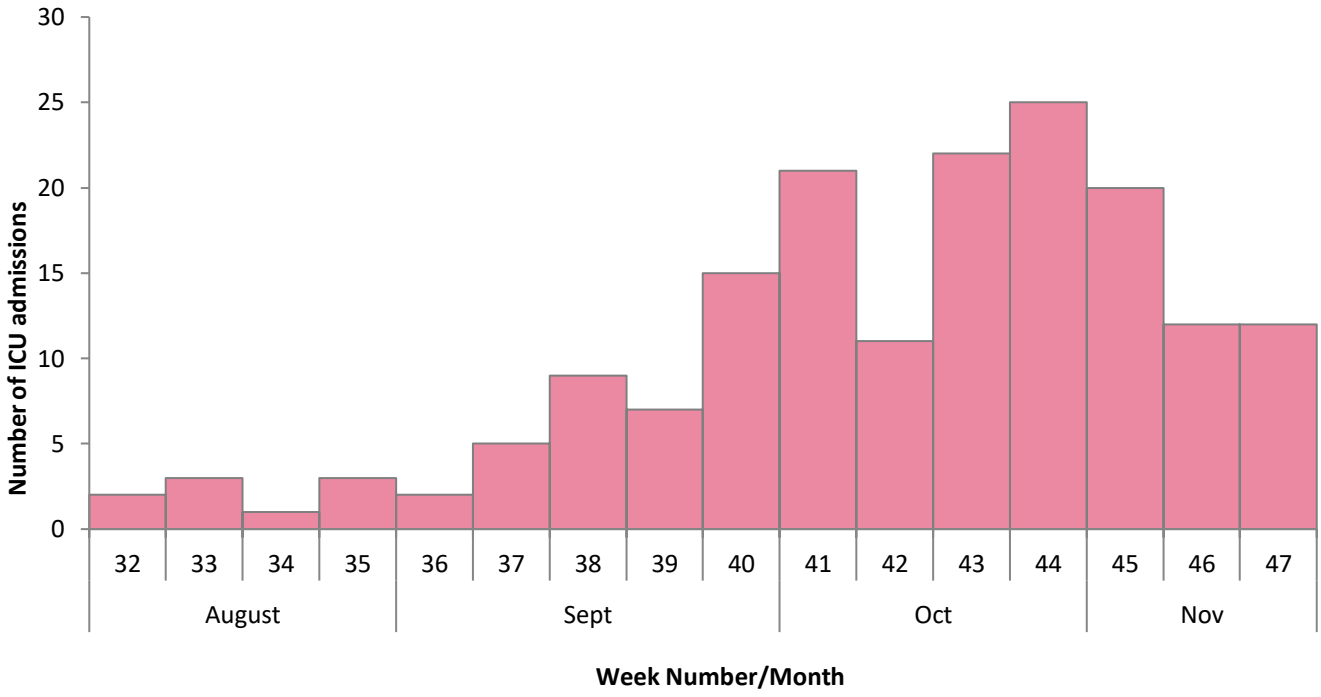
[2] Length of stay for those discharged alive refers to duration of stay after final discharge from ICU. Length of stay reflects the cumulative duration of stay, where applicable, for patients with more than one ICU admission.

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 2 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 2)[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

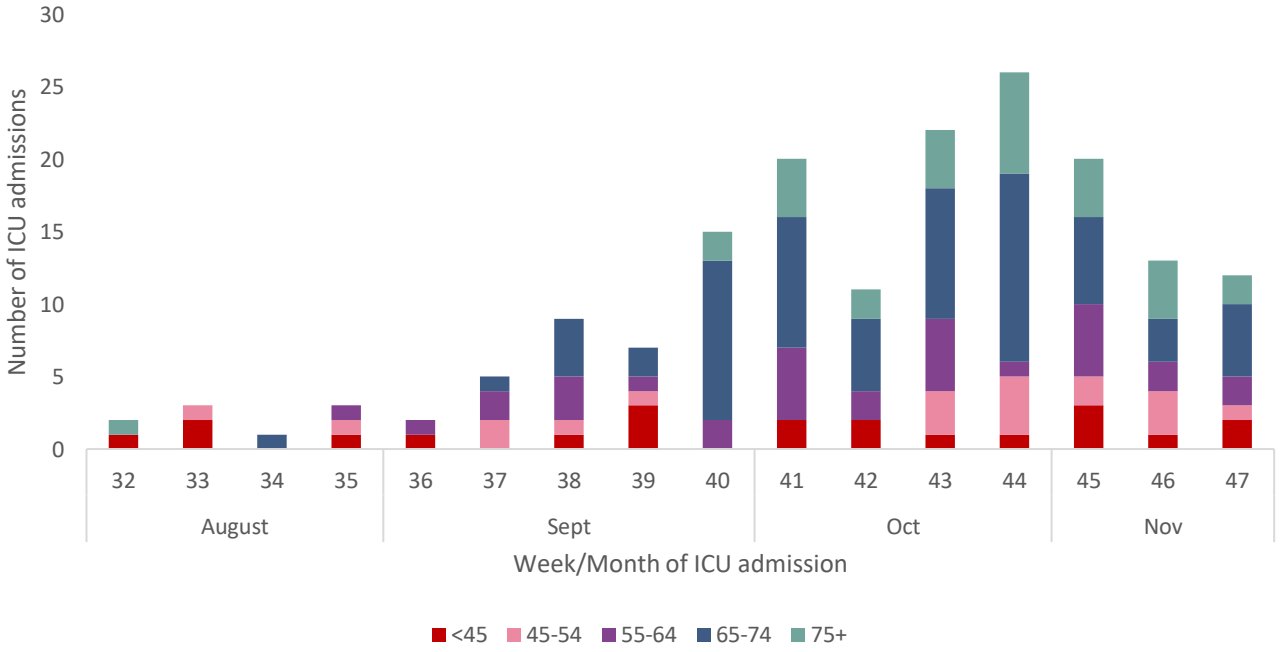
Of the 170 admissions to ICU during wave 2, 69% were male and 31% were female, giving a male: female ratio of 2.2:1. The mean age at time of admission to ICU was 64 years and the median age was 67 years (IQR: 57-73 years; Range: 19-87 years).

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

Age group (years)	Female		Male		Total		
	n	%	n	%	n	%	Rate per 100,000 population
15-24	1	1.9	2	1.7	3	1.8	0.5
25-34	0	0.0	2	1.7	2	1.2	0.3
35-44	5	9.4	9	7.7	14	8.2	1.9
45-54	8	15.1	11	9.4	19	11.2	3.0
55-64	11	20.8	21	17.9	32	18.8	6.3
65-74	19	35.8	51	43.6	70	41.2	18.7
75-84	8	15.1	20	17.1	28	16.5	14.2
≥85	1	1.9	1	0.9	2	1.2	3.0
Total	**53**	**100.0**	**117**	**100.0**	**170**	**100.0**	**4.5**

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

Table 3: Underlying medical conditions in cases of COVID-19 (aged 15 years and older) at time of first admission to ICU, Ireland[6] (Wave 2)

Underlying Medical Conditions	**n**	**% Total admissions**
One or more underlying conditions	156	91.8
No underlying conditions	14	8.2
	n	**% those with underlying illness**
Chronic heart disease	72	46.2
Hypertension	81	51.9
Chronic kidney disease	20	12.8
Chronic liver disease	6	3.8
Chronic neurological disease	11	7.1
Cancer/malignancy	27	17.3
Immunodeficiency, including HIV	9	5.8
Chronic respiratory disease	62	39.7
Chronic obstructive pulmonary disease	29	18.6
Bronchiectasis	3	1.9
Cystic fibrosis	0	0.0
Interstitial lung fibrosis	4	2.6
Asthma (requiring medication)	30	19.2
Severe Asthma	1	0.6
Mild to Moderate Asthma	11	7.1
Pregnant	0	0.0
<=6 weeks post partum	1	0.6
Obesity (BMI >=40)	26	16.7
Diabetes mellitus	56	35.9
Type I	*3*	*1.9*
Type II	*50*	*32.1*
Type unspecified	*3*	*1.9*
Haemoglobinopathy	3	1.9
Alcohol related disease	6	3.8

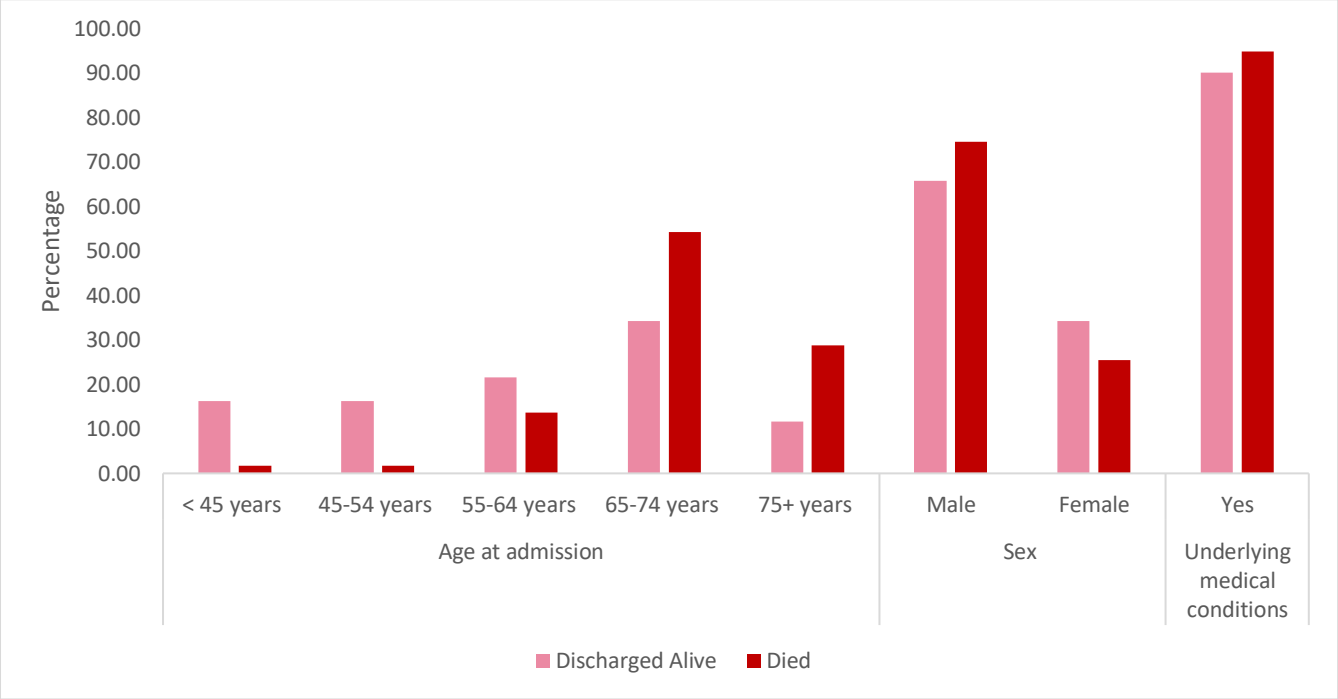
[6] More than one option can be selected for underlying condition so percentages will add to greater than 100%

3.0 Outcome for cases of COVID-19 admitted to ICU

Of the 170 cases admitted to ICU during wave 2, 111 were discharged alive (65% of total patients admitted to ICU) and 59 died (35% of total patients admitted to ICU). Of those who died, 55 were reported as having died in ICU and four 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 2)



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 2)

Complications/Illness during ICU stay	n	% of those discharged
Primary viral pneumonia	124	72.9
Secondary bacterial pneumonia	52	30.6
Acute respiratory distress syndrome (ARDS)	124	72.9
Pressor dependence during ICU stay	84	49.4
Myocarditis	2	1.2
Encephalitis	5	2.9
Sepsis	56	32.9
Multi-organ failure	15	8.8
Anti-coagulation for thrombotic event	15	8.8
Treatment Acute Kidney Injuries (AKI)	**n**	**% of those discharged**
Acute kidney injury	41	24.1
Received CRRT/IHD	23	13.5
Use of ventilation or intervention during ICU stay	**n**	**% of those discharged**
Yes	134	78.8
No	36	21.2
Type of Ventilation	**n**	**% of those discharged**
Biphasic intermittent positive airway pressure (BiPAP)	57	33.5
Continuous positive airway pressure (CPAP)	62	36.5
Conventional (including lung protective) mechanical ventilation	88	51.8
High frequency oscillatory ventilation (HFOV)	5	2.9
Required ECMO	3	1.8
Outcome	**n**	**% of those discharged**
Transferred to ward	105	61.8
Transferred to HDU	6	3.5
Died	59	34.7

[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 residence[8], Ireland (Wave 2)

HSE Area	n	%	Rate per 100,00 population
East	71	41.8	4.1
Midlands	17	10.0	5.8
Mid-West	19	11.2	4.9
North-East	14	8.2	3.0
North-West	13	7.6	5.0
South	14	8.2	2.0
South East	14	8.2	2.7
West	8	4.7	1.8
Total	**170**	**100.0**	**3.6**

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

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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/