



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

Report prepared by HPSC on 29.12.2021 (data from 27.06.2021 to midnight 25.12.2021)

The following report provides data on cases (aged 15 years and older) with confirmed COVID-19 who have been admitted to ICU since the start of the 4<sup>th</sup> pandemic wave (27.06.2021) and notified to the Computerised Infectious Disease Reporting system (CIDR) at HPSC, as of midnight on 25.12.2021.

A graph on total admissions to ICU (aged 15 years and older) from 16.02.2020 up to 25.12.2021 is included in Appendix A.

In total, there have been 29 children (aged 0-14 years) reported to the HPSC as having been admitted to ICU with confirmed COVID-19 between 16.02.2020 and 25.12.2021 (inclusive). A report of ICU admissions in children (aged 0-14 years) with confirmed COVID-19 infection between March 2020 and November 2021 can be found at <https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/surveillance/covid-19intensivecareadmissions/>

Reports on Wave 1, Wave 2 and Wave 3 of the pandemic can be found at <https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/surveillance/covid-19intensivecareadmissions/>

A report on vaccination status among cases, including those admitted to ICU can be found at <https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/surveillance/vaccinationstatusreports/>

## 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

Table 1 provides a summary of cases with confirmed COVID-19 who were admitted to ICU in Wave 4.

**Table 1. Summary of cases (aged 15 years and older) of COVID-19 admitted to ICU in Ireland<sup>1 2 3</sup>  
(27.06.2021 to 25.12.2021)**

		n	%
Total number of cases admitted to ICU		697	100.0
Number currently in ICU		93	13.5
	<i>Number in ICU, never transferred</i>	80	11.5
	<i>Number transferred to second ICU</i>	13	1.9
Total number of cases discharged alive		387	55.5
Deaths in ICU cases to date		217	31.1
Route of Admission	Ward	507	72.7
	Emergency Department	168	24.1
	Other Hospital - ICU	1	0.1
	Other Hospital - non ICU	20	2.9
Sex & Age	Male:Female Ratio	1.5:1	-
	Median Age (years)	59	-
	Age Range (years)	15 - 88	-
	15-24 years	17	2.4
	25-34 years	57	8.2
	35-44 years	91	13.1
	45-54 years	134	19.2
	55-64 years	138	19.8
	65-74 years	192	27.5
	75-84 years	63	9.0
	85+ years	5	0.7
Underlying medical conditions	Those with underlying medical condition (%)	553	79.3
Illness severity (at time of admission)	Acute Respiratory Distress Syndrome (ARDS)	460	66.0
	Require non-invasive mechanical ventilation	451	64.7
	Require invasive mechanical ventilation	191	27.4
	Require Renal Replacement therapy	29	4.2
Clinical complications reported during ICU stay (at time of discharge in those who have been discharged)	Primary viral pneumonia	510	82.7
	Secondary bacterial pneumonia	171	27.7
	Acute Respiratory Distress Syndrome (ARDS)	404	65.5
	Acute kidney injury	137	22.2
	Sepsis	153	24.8
	Multi-organ failure	83	13.5
Type of ventilation reported during ICU stay (at time of discharge in those who have been discharged)	Biphasic intermittent positive airway pressure (BiPAP)	189	30.6
	Continuous positive airway pressure (CPAP)	293	47.5
	Conventional mechanical ventilation	289	46.8
	High frequency oscillatory ventilation (HFOV)	8	1.3
	ECMO	10	1.6
Length of stay for those discharged alive	Median (days)	8	-
	Range (days)	1 - 90	-
Length of stay for those who have died	Median (days)	11	-
	Range (days)	1 - 62	-

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

<sup>2</sup> For clinical complications, the denominator is those who have been discharged from ICU, including people who have been discharged to another ICU and people discharged with outcome unknown

<sup>3</sup> 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.

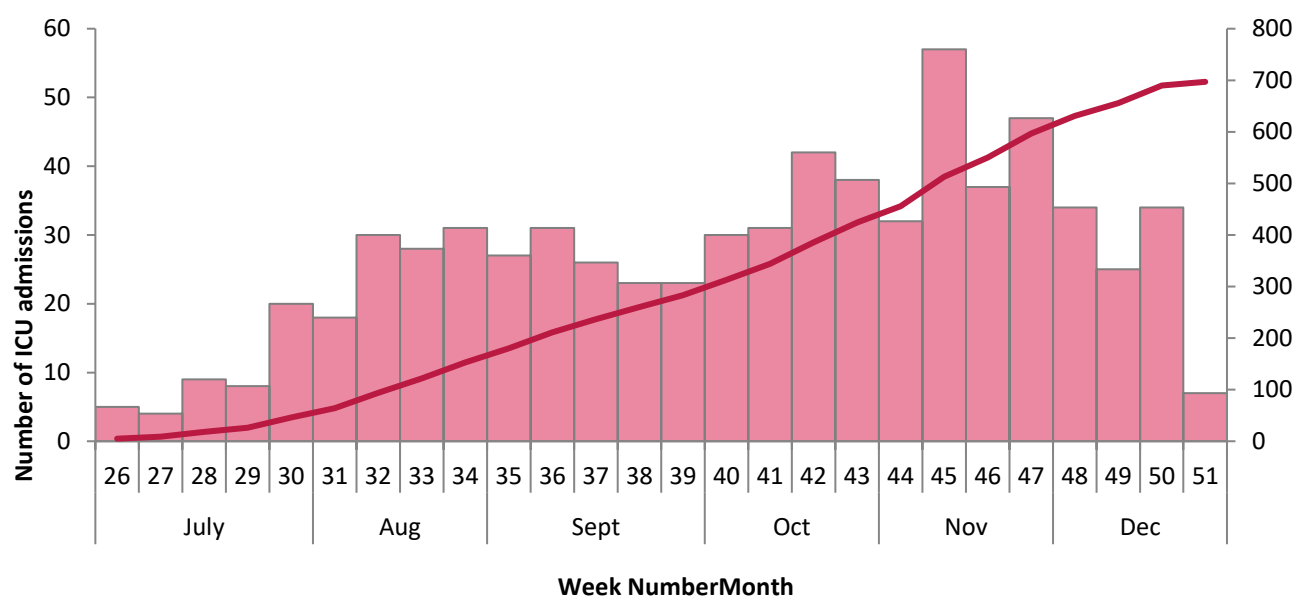
## 2.0 Admissions to ICU

### 2.1 Date of admission to ICU

A graph of COVID-19 cases by week of admission to ICU in Wave 4 is shown in figure 1.

A graph of all cases of COVID-19 by week of admission to ICU is shown in Appendix A.

**Figure 1. Cases of COVID-19 (aged 15 years and older) admitted to ICU by week of admission in Ireland (27.06.2021 to 25.12.2021)<sup>4 5 6</sup>**



<sup>4</sup> See technical notes for more information on dates for which week numbers correspond

<sup>5</sup> Please note that most recent weeks may not yet reflect all admissions.

<sup>6</sup> For cases with multiple ICU admissions, the date of first admission to ICU is presented

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

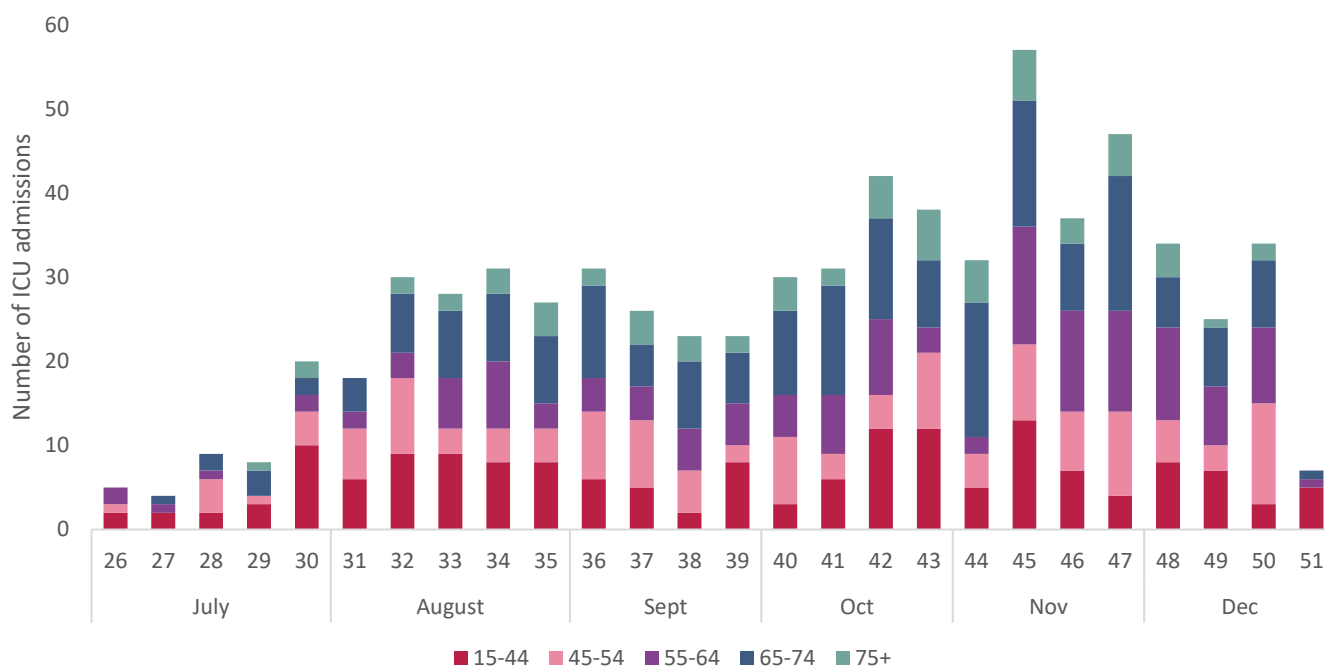
Of the 638 admissions to ICU (aged 15 years and over), 60% were male and 40% were female, giving a male: female ratio of 1.5:1. The mean age at time of admission to ICU was 56 years and the median age was 59 years (IQR: 45-68 years; range: 15-88 years).

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 (27.06.2021 to 25.12.2021)

Age group (years)	Female		Male		Total		Rate per 100,000 population
	n	%	n	%	n	%	
15-24	9	3.3	8	1.9	17	2.4	2.9
25-34	40	14.5	17	4.0	57	8.2	8.6
35-44	40	14.5	51	12.1	91	13.1	12.2
45-54	41	14.9	93	22.1	134	19.2	21.4
55-64	51	18.5	87	20.7	138	19.8	27.1
65-74	72	26.1	120	28.5	192	27.5	51.4
75-84	21	7.6	42	10.0	63	9.0	32.1
≥85	2	0.7	3	0.7	5	0.7	7.4
<b>Total</b>	<b>276</b>	<b>100.0</b>	<b>421</b>	<b>100.0</b>	<b>697</b>	<b>100.0</b>	<b>18.6</b>

**Figure 2.** Cases of COVID-19 (aged 15 years and older) admitted to ICU by week of admission in Ireland, stratified by age group<sup>7</sup> (27.06.2021 to 25.12.2021)



<sup>7</sup> See technical notes 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 at time of first admission to ICU 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<sup>8</sup> (27.06.2021 to 25.12.2021)**

Underlying Medical Conditions	Number	% Total admissions
One or more underlying medical conditions	553	79.3
No underlying medical conditions	144	20.7
	Number	% Those with underlying illness
Chronic heart disease	194	35.1
Hypertension	254	45.9
Chronic kidney disease	68	12.3
Chronic liver disease	23	4.2
Chronic neurological disease	30	5.4
Cancer/malignancy	72	13.0
Immunodeficiency, incl HIV	103	18.6
Chronic respiratory disease	163	29.5
Chronic obstructive pulmonary disease	84	15.2
Bronchiectasis	8	1.4
Cystic fibrosis	1	0.2
Interstitial lung fibrosis	10	1.8
Asthma (requiring medication)	68	12.3
Severe Asthma	1	0.2
Mild to Moderate Asthma	59	10.7
Pregnant	25	4.5
<=6 weeks post partum	13	2.4
Obesity (BMI >=40)	65	11.8
Diabetes mellitus	130	23.5
Type I	12	2.2
Type II	104	18.8
Type unspecified	14	2.5
Haemoglobinopathy	4	0.7
Alcohol related disease	18	3.3

<sup>8</sup> More than one option can be selected for underlying condition so percentages will add to greater than 100%

## 2.4 Pregnancy

Pregnancy was reported in 25 cases of COVID-19 during wave 4 (9% of female cases). This compares to one case (0.7% of female cases) in Wave 1 (16.02.2020-01.08.2020), no cases in Wave 2 (02.08.2020-21.11.2020) and 19 cases (5% of female cases) in Wave 3 (22.11.2020-26.06.2021).

The median age of pregnant women was 33 years (range 25-43 years). Twelve had underlying medical conditions and eleven received invasive mechanical ventilation.

Data on trimester of pregnancy were available for 20 of the pregnant cases; one was in the first trimester of pregnancy; eight were in the second trimester of pregnancy; and 11 were in the third trimester of pregnancy.

COVID-19 vaccination data were available for all of the pregnant cases. Twenty-two cases reported not having received a vaccine, two cases reported having received one dose of a two-dose vaccine regimen prior to infection and one case had received two doses of a two dose regimen prior to infection.

### 3.0 Outcome for cases of COVID-19 admitted to ICU

Of the 697 cases (aged 15 years and over) admitted to ICU, 387 were discharged alive (56% of total patients admitted to ICU), 217 died (31% of total patients admitted to ICU) and 93 are still in ICU (13% of total patients admitted to ICU) – including 13 transferred to another ICU. Of those who died, 196 patients were reported as having died in ICU and 21 died following transfer from ICU to a ward or high dependency unit.

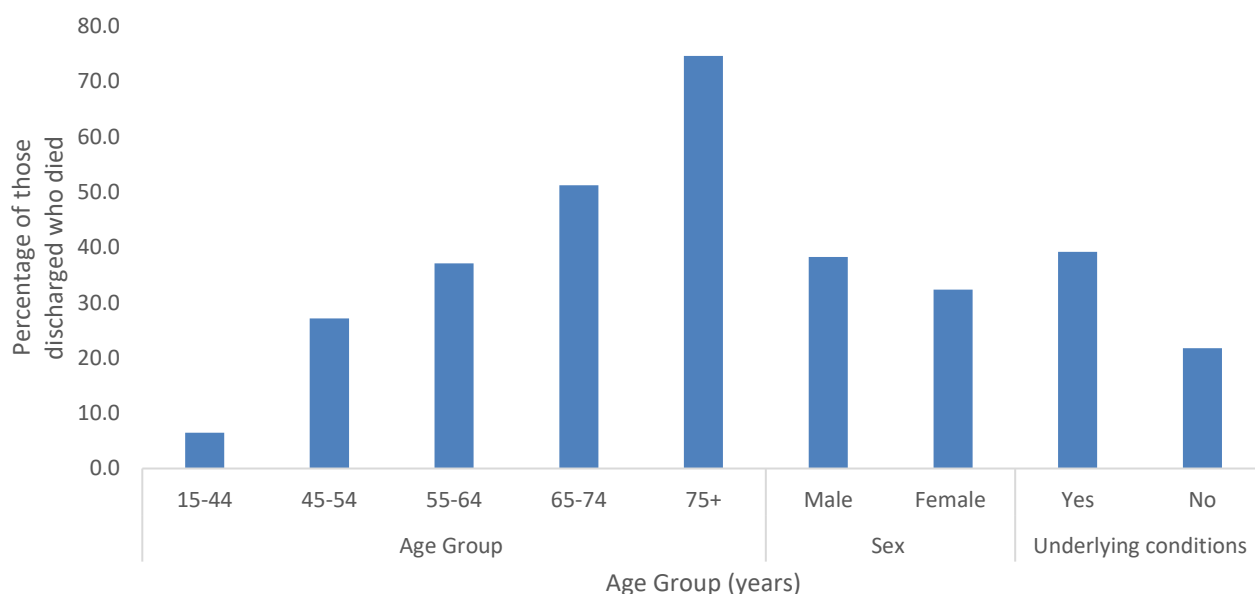
Table 4 describes the profile of patients with COVID-19 who have either been discharged alive from ICU or died in/post admission to ICU.

Figure 3 describes the percentage 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 (27.06.2021 to 25.12.2021)**

		Discharged alive (n= 387)		Died (n=217)		Total
Age Group	15-44	130	93.5	9	6.5	139
	45-54	86	72.9	32	27.1	118
	55-64	73	62.9	43	37.1	116
	65-74	82	48.8	86	51.2	168
	75+	16	25.4	47	74.6	63
Sex	Male	226	61.7	140	38.3	366
	Female	161	67.6	77	32.4	238
Underlying conditions	Yes	297	60.9	191	39.1	488
	No	90	78.3	25	21.7	115

**Figure 3. Profile of cases of confirmed COVID-19 (aged 15 years and older) who died in/post admission to ICU in Ireland (27.06.2021 to 25.12.2021)**





### 3.1 Clinical complications among those discharged from ICU

Discharge information has been received for 617 patients: 387 were discharged alive; 217 died and 13 were discharged to another ICU.

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<sup>9 10</sup>(27.06.2021 to 25.12.2021)**

	Number	%
<b>Total number of cases discharged from ICU</b>	<b>617</b>	<b>88.5</b>
<b>Complications/Illness during ICU stay</b>	<b>Number</b>	<b>% of those discharged</b>
Primary viral pneumonia	510	82.7
Secondary bacterial pneumonia	171	27.7
Acute respiratory distress syndrome (ARDS)	404	65.5
Pressor dependence during ICU stay	276	44.7
Myocarditis	6	1.0
Encephalitis	4	0.6
Sepsis	153	24.8
Multi-organ failure	83	13.5
Anti-coagulation for thrombotic event	71	11.5
<b>Treatment Acute Kidney Injuries (AKI)</b>	<b>Number</b>	<b>% of those discharged</b>
Acute kidney injury	137	22.2
Received CRRT/IHD	77	12.5
<b>Use of ventilation or intervention during ICU stay</b>	<b>Number</b>	<b>% of those discharged</b>
Yes	516	83.6
No	101	16.4
<b>Type of Ventilation</b>	<b>Number</b>	<b>% of those discharged</b>
Biphasic intermittent positive airway pressure (BiPAP)	189	30.6
Continuous positive airway pressure (CPAP)	293	47.5
Conventional (including lung protective) mechanical ventilation	289	46.8
High frequency oscillatory ventilation (HFOV)	8	1.3
Required ECMO	10	1.6

<sup>9</sup> More than one option can be selected for clinical complications so percentages will add to greater than 100%.

<sup>10</sup> For the analysis in this table, please note that the number discharged includes people who have been discharged to another ICU and people who have been discharged with outcome unknown at this time.

## 4.0 Admission activity by location

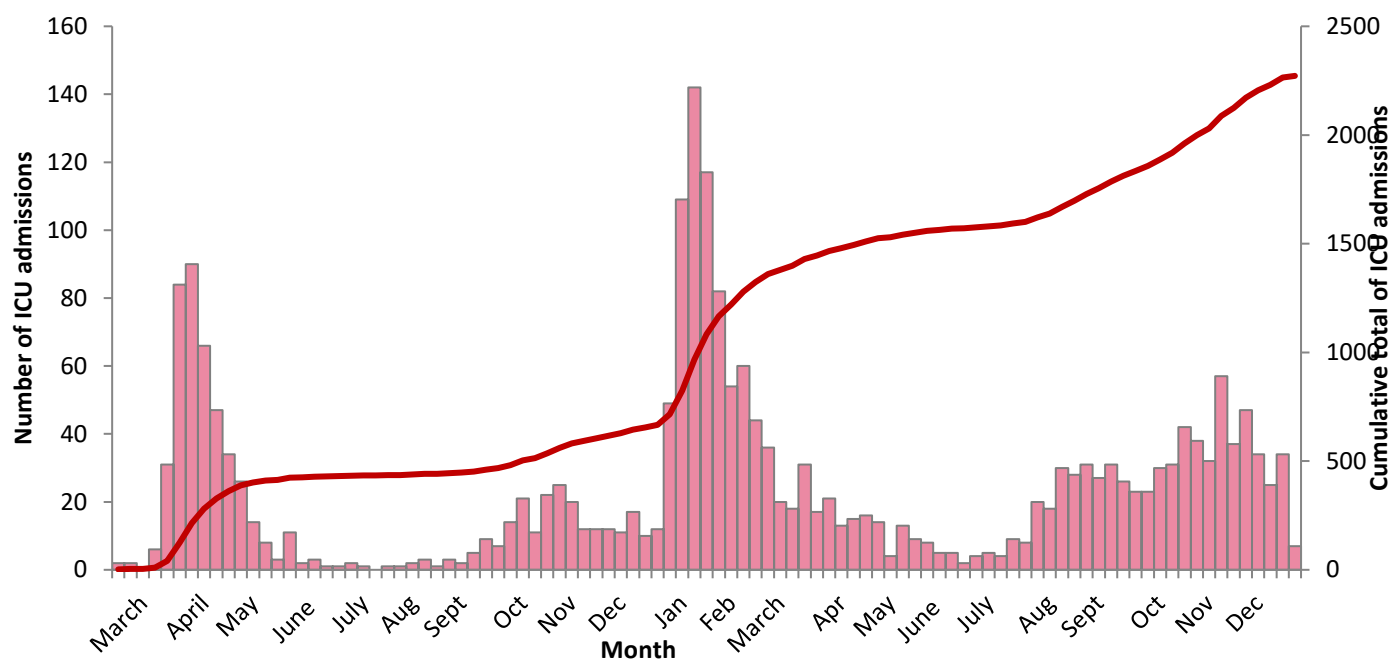
Table 6 describes the distribution of cases of COVID-19 admitted to ICU in Ireland by HSE area of residence.

**Table 6. Area of residence of cases of COVID-19 (aged 15 years and older) admitted to ICU<sup>11</sup>, Ireland (27.06.2021 to 25.12.2021)**

HSE Area	n	%	Rate per 100,00 population
East	255	36.6	14.9
Midlands	64	9.2	21.9
Mid-West	42	6.0	10.9
North-East	88	12.6	19.1
North-West	54	7.7	20.9
South	67	9.6	9.7
South East	61	8.8	12.0
West	66	9.5	14.6
<b>Total</b>	<b>697</b>	<b>100.0</b>	<b>14.6</b>

<sup>11</sup> See technical notes for counties associated with each HSE area

**Appendix A: Cases of COVID-19 (aged 15 years and older) admitted to ICU by week of admission in Ireland, from 16.02.2020 to 25.12.2021** <sup>12 13 14</sup>



<sup>12</sup> See technical notes for more information on week numbers

<sup>13</sup> Please note that most recent weeks may not yet reflect all admissions

<sup>14</sup> For cases with multiple ICU admissions, the date of first admission to ICU is presented

## 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 <https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/casedefinitions/>
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
  - 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.
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.
8. Information on the epidemiological weeks for 2020/2021 can be found [here](#).