



Vaccination status of laboratory confirmed cases of COVID-19 in those age ≥ 12 years, notified in Ireland during the 4th pandemic wave, 27th June – 4th December, 2021 (Week 26-48, 2021)

Report prepared by HPSC Epidemiology Team, 13/12/2021

Highlights

- **Risk of severe outcomes during the month of November 2021**
 - unvaccinated individuals were **4 times** more likely to be hospitalised with laboratory confirmed COVID-19 than fully vaccinated individuals
 - unvaccinated individuals were **11 times** more likely to be admitted to ICU with laboratory confirmed COVID-19 than fully vaccinated individuals
- **COVID-19 cases notified between 27th June and 4th December, 2021 (Weeks 26-48)**
 - 261,754 laboratory confirmed cases of COVID-19 were notified to HPSC
 - 37.7% (n=98,594) of cases were fully vaccinated
 - 2.5% (n=2,493) of fully vaccinated cases were hospitalised
 - 0.2% (n=236) of fully vaccinated cases were admitted to ICU
 - 0.4% (n=437) of fully vaccinated cases died due to COVID-19
 - 6.3% (n=6,174) of fully vaccinated cases were healthcare workers (HCWs)
- **ICU cases notified between 27th June and 4th December, 2021 (Weeks 26-48)**
 - 634 persons (age ≥ 12 years) were reported to HPSC as admitted to ICU with confirmed COVID-19 infection
 - 37% (n=236) of ICU cases were fully vaccinated; 75% (n=178) were ≥ 60 years of age
 - 58% (n=365) of ICU cases were unvaccinated; 68% (n=248) were < 60 years of age
- **Deaths in cases notified between 27th June and 4th December, 2021 (Weeks 26-48)**
 - 690 deaths due to COVID-19 in laboratory confirmed cases were notified to HPSC
 - 63% (n=437) of deaths were in fully vaccinated cases; 84% (n=367) were ≥ 70 years of age

The proportion of cases known to be fully vaccinated and unvaccinated are summarised below for the fourth wave of the COVID-19 pandemic (weeks 26-48 2021) and for the most recent four weeks covered in this report (weeks 45-48 2021).

		All cases (n=261,754)	Hospitalised (n=5,678)	ICU (n=634)	Died (n=690)	HCW (n=9,424)
27 Jun – 4 Dec 2021 (Weeks 26-48)	Fully vaccinated	38%	44%	37%	63%	66%
	Not vaccinated	35%	32%	58%	19%	13%
		All cases (n=96,290)	Hospitalised (n=1,363)	ICU (n=136)	Died (n=114)	HCW (n=1,948)
7 Nov – 4 Dec 2021 (Weeks 45-48)	Fully vaccinated	45%	45%	40%	52%	67%
	Not vaccinated	15%	21%	45%	16%	10%

Background

This report presents the COVID-19 vaccination status at the time of infection of laboratory confirmed cases of COVID-19 among those 12 years of age and older and notified on the national Computerised Infectious Disease Reporting (CIDR) system hosted by HPSC during the fourth wave i.e. between 27th June 2021 and 4th December, 2021. Data on the COVID-19 vaccination status of COVID-19 cases should be interpreted in the context of vaccine coverage (<https://covid-19.geohive.ie/pages/vaccinations>). As the vast majority (90%) of the adult population in Ireland is now fully vaccinated, even with a highly effective vaccine, we still expect to see cases amongst vaccinated individuals.

The impact of the COVID-19 vaccination programme has resulted in an overall decline in the incidence of severe cases and deaths since the national roll-out of the COVID-19 vaccination programme began, for details see the weekly COVID-19 Epidemiology report available at www.hpsc.ie.

Linking CIDR notifications with vaccination records on COVAX

COVID-19 vaccination details on cases were obtained primarily through linkage of case (event) records on CIDR with vaccination records on COVAX (the HSE national immunisation registry for COVID-19 vaccination) using an automated matching process (prior to this process being established a manual process was used for ICU cases, deaths and cases linked to outbreaks in residential care facilities). Vaccination details on linked records that meet the quality checks assigned by HPSC are imported to CIDR using an automated robotic process.

For cases where matches have not yet been established through linkage with COVAX, vaccination details on some cases were obtained from the following sources:

1. Vaccination details reported to HPSC on surveillance forms relating to ICU admissions
2. Self-reported vaccination status and number of doses of vaccine received prior to infection collected by the Contact Management Programme (CMP) during the Positive Patient Assessment (PPA) interview.

Based on the available details, vaccination status was assigned to each case and vaccination status definitions are provided in the Technical Notes at the end of this document.

Rates of severe outcomes among COVID-19 cases, July-November, 2021

Note: This section of the report and Table 1 will be updated once monthly i.e. on or after the 15th day following month end.

Crude incidence rates of COVID-19 hospitalisation, ICU admission, and death for all cases notified July-October 2021 among vaccinated and unvaccinated individuals are presented in Table 1.

Incidence rates were calculated using the cumulative number of vaccinated individuals in the eligible population by mid-point of each month. Vaccination status was classified into four categories (see Technical Notes provided at the end of the document).

Please note the following caveats when interpreting these data:

- 1) Crude death rates are not adjusted for factors which may result in statistical bias due to the effect of: age, comorbidity, ethnicity, immunosuppression etc. on risk of severe COVID-19 outcome.
- 2) The rollout of the COVID-19 vaccination programme and order in which different risk groups were vaccinated likely explains some of the observations, e.g. older people and those with underlying conditions, who at greater risk of severe disease, were offered vaccination first.
- 3) Risk behavioural differences between unvaccinated and vaccinated members of the population may also influence the risk of severe outcome, in terms of exposure to SARS-CoV-2 and probability of natural immunity prior to vaccination.

Table 1: Incidence rates of severe COVID-19 outcomes per 100,000 of the population in those ≥12 years of age by vaccination status, Ireland, July to November, 2021

	Vaccine status	subpopulation	Hospitalisation		ICU admission		Death	
			n	Rate	n	Rate	n	Rate
				/100,000		/100,000		/100,000
July	Fully vaccinated	2,504,271	127	5.1	9	0.4	19	0.8
	Partially vaccinated	482,710	69	14.3	6	1.2	3	0.6
	Unvaccinated	1,165,729	186	16.0	32	2.7	7	0.6
	Unlinked		55	4.7	0	0.0	1	0.1
	Total population**	4,152,710	437		47		30	
	Relative risk				3.1		7.6	
Interpretation	<ul style="list-style-type: none"> Unvaccinated people were 3 times more likely to be hospitalised with COVID-19 than fully vaccinated people. Unvaccinated people were 8 times more likely to be admitted to ICU with COVID-19 than fully vaccinated people. 							
August	Fully vaccinated	3,255,268	466	14.3	40	1.2	93	2.9
	Partially vaccinated	362,265	90	24.8	8	2.2	4	1.1
	Unvaccinated	535,177	320	59.8	68	12.7	19	3.6
	Unlinked		85	15.9	1	0.2	0	0.0
	Total population**	4,152,710	961		117		116	
	Relative risk				4.2		10.3	
Interpretation	<ul style="list-style-type: none"> Unvaccinated people were 4 times more likely to be hospitalised with COVID-19 than fully vaccinated people. Unvaccinated people were 10 times more likely to be admitted to ICU with COVID-19 than fully vaccinated people. 							
September	Fully vaccinated	3,619,776	670	18.5	51	1.4	161	4.4
	Partially vaccinated	135,145	63	46.6	4	3.0	1	0.7
	Unvaccinated	397,789	370	93.0	85	21.4	38	9.6
	Unlinked		93	23.4	0	0.0	2	0.5
	Total population**	4,152,710	1196		140		202	
	Relative risk				5.0		15.2	
Interpretation	<ul style="list-style-type: none"> Unvaccinated people were 5 times more likely to be hospitalised with COVID-19 than fully vaccinated people. Unvaccinated people were 15 times more likely to be admitted to ICU with COVID-19 than fully vaccinated people. 							
October	Fully vaccinated	3,730,222	854	22.9	61	1.6	141	3.8
	Partially vaccinated	60,758	35	57.6	4	6.6	4	6.6
	Unvaccinated	361,730	281	77.7	64	17.7	28	7.7
	Unlinked		89	24.6	3	0.8	8	2.2
	Total population**	4,152,710	1259		132		181	

	Relative risk			3.4		10.8		2.0
Interpretation	<ul style="list-style-type: none"> Unvaccinated people were 3 times more likely to be hospitalised with COVID-19 than fully vaccinated people. Unvaccinated people were 11 times more likely to be admitted to ICU with COVID-19 than fully vaccinated people. 							
November			Hospitalisation		ICU admission		Death	
	Vaccine status	subpopulation	n	Rate	n	Rate	n	Rate
				/100,000		/100,000		/100,000
	Fully vaccinated	3,781,839	956	25.3	79	2.1	110	2.9
	Partially vaccinated	64,111	35	54.6	7	10.9	1	1.6
	Unvaccinated	306,760	281	91.6	71	23.1	22	7.2
	Unlinked		220	71.7	13	4.2	13	4.2
Total population**	4,152,710	1492			170		146	
	Relative risk			3.6		11.1		2.5
Interpretation	<ul style="list-style-type: none"> Unvaccinated people were 4 times more likely to be hospitalised with COVID-19 than fully vaccinated people. Unvaccinated people were 11 times more likely to be admitted to ICU with COVID-19 than fully vaccinated people. 							

Notes

Crude incidence rates of COVID-19 hospitalisation, ICU admission, and death for all cases notified Epi week 26 to Epi week 48

Rates calculated using cumulative number of vaccinated individuals in eligible population by mid-point of each month

Vaccination status classified into 4 categories using 13 CIDR variables available

Fully vaccinated refers to those having received 2 doses of COVID-19 vaccine.

Relative risk calculated as the rate among unvaccinated divided by the rate among the fully vaccinated for each outcome

**Eligible population according to HIU estimate of population aged 12 years and above in April 2021

COVID-19 Vaccination status of cases – Fourth wave of COVID-19 pandemic (weeks 26-48, 2021)

So far during the fourth wave of the pandemic, between 27th June and 4th December 2021 (weeks 26-46), 323,471 laboratory confirmed cases of COVID-19 were notified in Ireland. In total, 61,679 (19%) occurred in children <12 years of age and since this cohort is currently not eligible for vaccination, these cases are excluded from the remaining analysis.

Among laboratory confirmed cases of COVID-19 notified in those ≥12 years of age between 27th June and 4th December 2021:

- 261,754 cases in total were notified and 38% were fully vaccinated
- 5,678 (2.2%) of cases were hospitalised and 44% were fully vaccinated
- 634 (0.24%) of cases were admitted to ICU and 37% were fully vaccinated
- 690 (0.26%) of cases died (where cause of death due to COVID-19) and 63% were fully vaccinated
- 9,424 (3.6%) of cases were healthcare workers (HCW) and 66% were fully vaccinated

Details on the vaccination status of cases notified during the 4th wave of the pandemic are presented in Table 2 and Figures 1 and 2.

Table 2. Vaccination status of laboratory confirmed cases of COVID-19 in those ≥12 years of age, notified in Ireland, 27th June and 4th December (Weeks 26-48) 2021

	All cases		Hospitalised*		ICU		Died†		HCWs	
	n	%	n	%	n	%	n	%	n	%
Fully vaccinated	98,594	37.7	2,493	43.9	236	37.2	437	63.3	6,174	65.5
Likely vaccinated ≥70yrs‡	2,003	0.8	211	3.7	6	0.9	62	9.0	0	0.0
Vaccinated – self reported 3 doses	2	0.0	0	0.0	0	0.0	0	0.0	2	0.0
Vaccinated – self reported 2 doses	23,028	8.8	534	9.4	7	1.1	35	5.1	1,944	20.6
Partially vaccinated	10,078	3.9	105	1.8	21	3.3	6	0.9	97	1.0
Vaccinated – self reported 1 dose	17,665	6.7	191	3.4	9	1.4	6	0.9	195	2.1
Vaccinated – self reported dose unknown	701	0.3	12	0.2	0	0.0	2	0.3	19	0.2
Not vaccinated	63,006	24.1	1,520	26.8	335	52.8	117	17.0	871	9.2
Unknown **	46,677	17.8	612	10.8	20	3.2	25	3.6	122	1.3
Total	261,754	100.0	5,678	100.0	634	100.0	690	100.0	9,424	100.0

*Hospitalised, cases where patient type was reported as “Hospital inpatient”

†Died, deaths in laboratory confirmed cases of COVID-19 and where cause of death was due to COVID-19

‡ Cases ≥70 years of age and vaccination status is unknown, these are assumed to be vaccinated since almost 100% uptake in this cohort

**In addition to unvaccinated, also includes cases not yet protected from vaccination i.e. cases with an epi date that was 0 to <14 days following first dose of a vaccine

*†Includes cases with insufficient vaccination details to categorise vaccination status or where no link has yet been established with COVAX

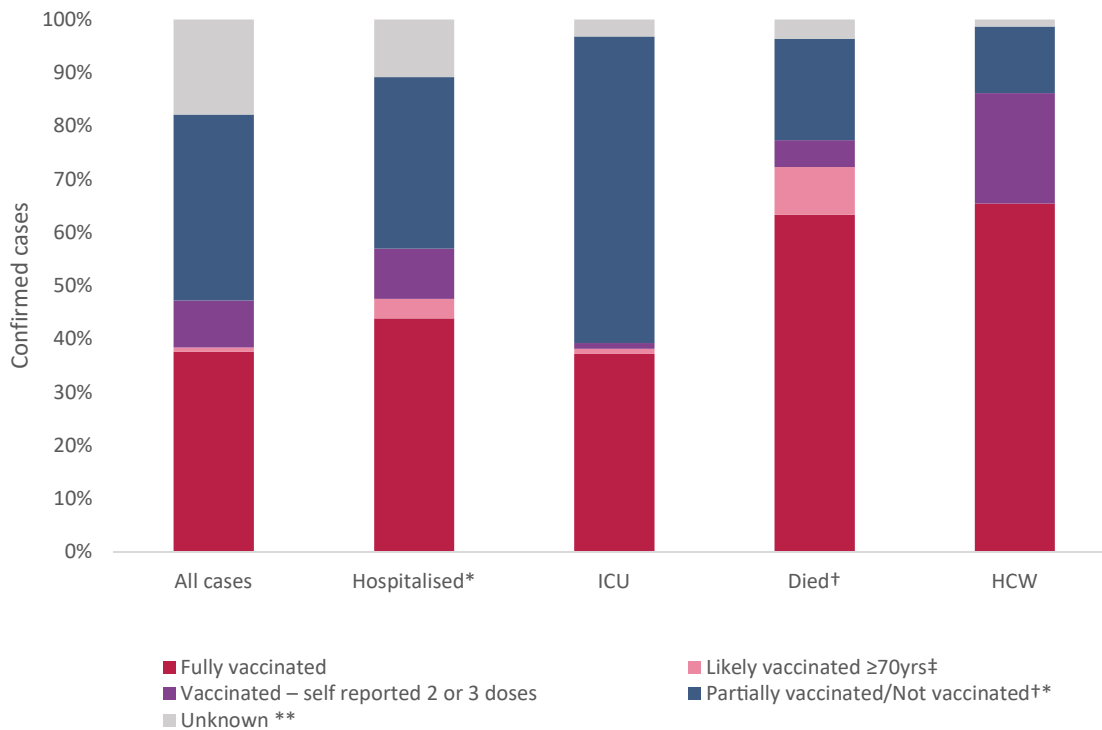


Figure 1. Vaccination status of laboratory confirmed cases of COVID-19 in those ≥12 years of age, notified in Ireland, 27th June and 4th December (Weeks 26-48) 2021

*Hospitalised, cases where patient type was reported as “Hospital inpatient”

†Died, deaths in laboratory confirmed cases of COVID-19 and where cause of death was due to COVID-19

‡Cases ≥70 years of age and vaccination status is unknown, these are assumed to be vaccinated since almost 100% uptake in this cohort

†*Includes those classified as partially vaccinated, self-reported 1 dose, self-reported dose unknown and not vaccinated (i.e. unvaccinated and those not yet protected from vaccination i.e. cases with an epi date that was 0 to <14 days following first dose of a vaccine)

**Includes cases where insufficient vaccination details are available to categorise vaccination status or where no link has yet been established with COVAX

Note: 74% (n=513) of those who died were ≥70 years of age and although the majority were vaccinated not all may have mounted an adequate immune response. Therefore, the high proportion of deaths in fully vaccinated individuals is confounded by age.

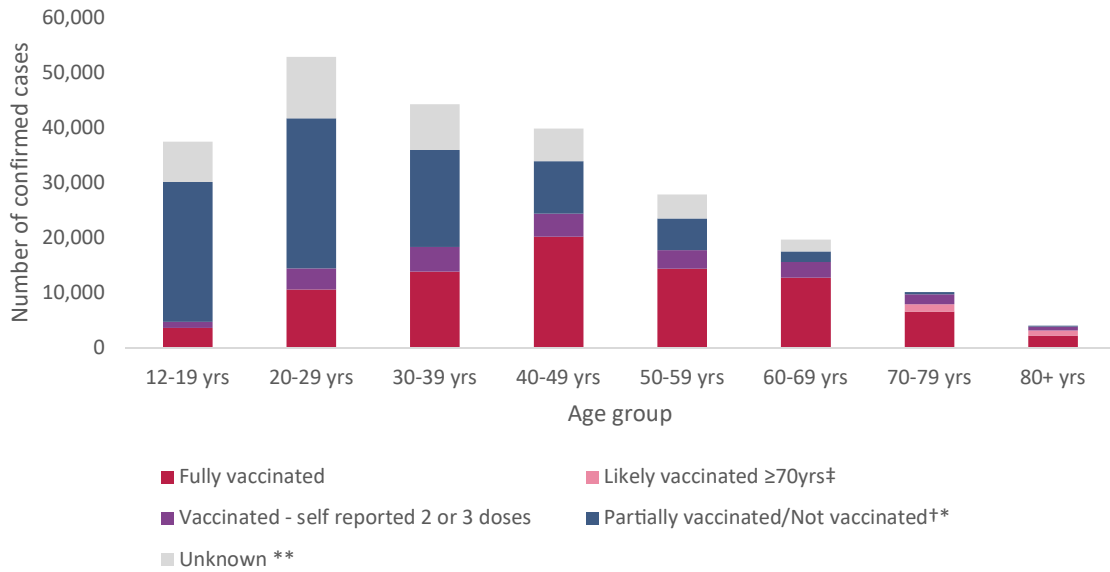


Figure 2a. Number of laboratory confirmed cases of COVID-19 in those ≥12 years of age by vaccination status and age group, notified in Ireland, 27th June and 4th December (Weeks 26-48) 2021
Please refer to footnotes provided under Figure 1.

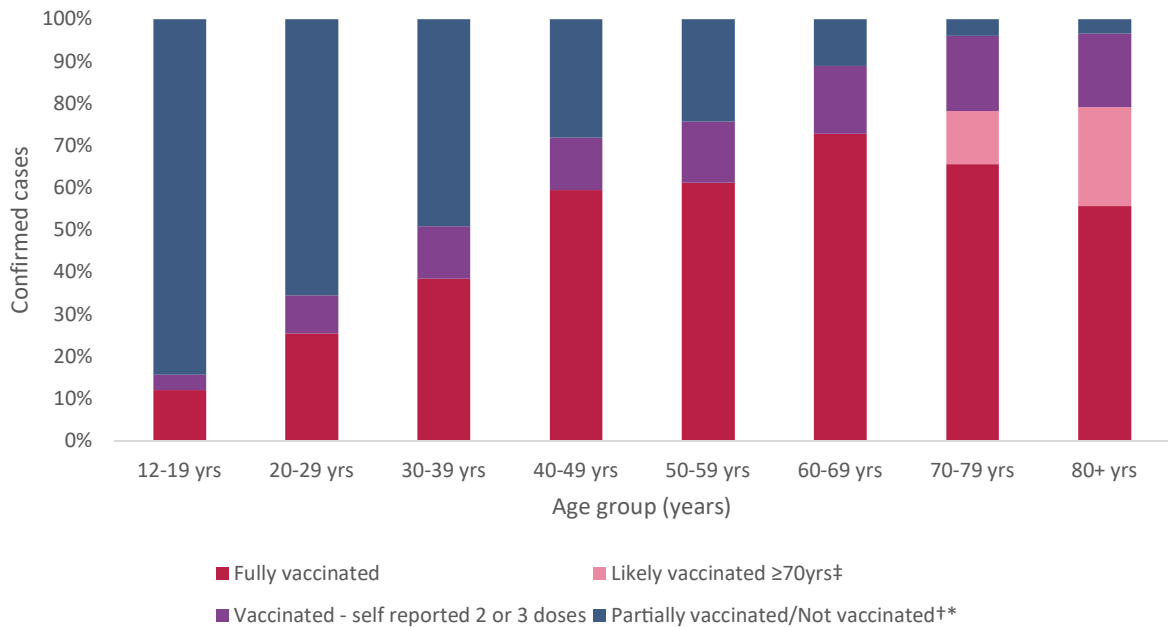


Figure 2b. Proportion of laboratory confirmed cases of COVID-19 in those ≥12 years of age by vaccination status and age group notified in Ireland, 27th June and 4th December (Weeks 26-48) 2021
Please refer to footnotes provided under Figure 1.

COVID-19 cases in fully vaccinated individuals, weeks 26-48, 2021

This section of the report focuses on the characteristics of COVID-19 cases in fully vaccinated individuals. Data presented are based on date these cases were notified on CIDR and focuses on the period 27th June – 4th December (Weeks 26-48), 2021.

See the definition of fully vaccinated provided in the Technical Notes section at the end of this document. Cases classified as “Likely vaccinated ≥70 yrs”, “Vaccinated – self report dose 2” and Vaccinated – self report dose 3” are excluded from the analysis in this section of the report, as insufficient data was available to confirm if these cases are fully vaccinated.

In total, 98,594 cases of laboratory confirmed COVID-19 in fully vaccinated individuals have been notified in weeks 26-48, 2021. The proportion of laboratory confirmed cases in fully vaccinated individuals ranges between 4% and 53% per week, with the proportion steadily increasing from week 30 and peaking in week 43 (Figure 3). Cases in fully vaccinated individuals have occurred in all age groups. The weekly number of cases in fully vaccinated individuals by age group are presented in Figure 4a and Figure 4b. The characteristics of fully vaccinated cases including among those hospitalised, admitted to ICU, died due to COVID-19 and among HCWs are presented in Table 4. The time interval from being fully vaccinated (14 days following final dose) to infection ranged from 1-302 days (IQR=65 days), 80% of these cases arose within 150 days (i.e. 5 months) of being fully vaccinated (Figure 5).

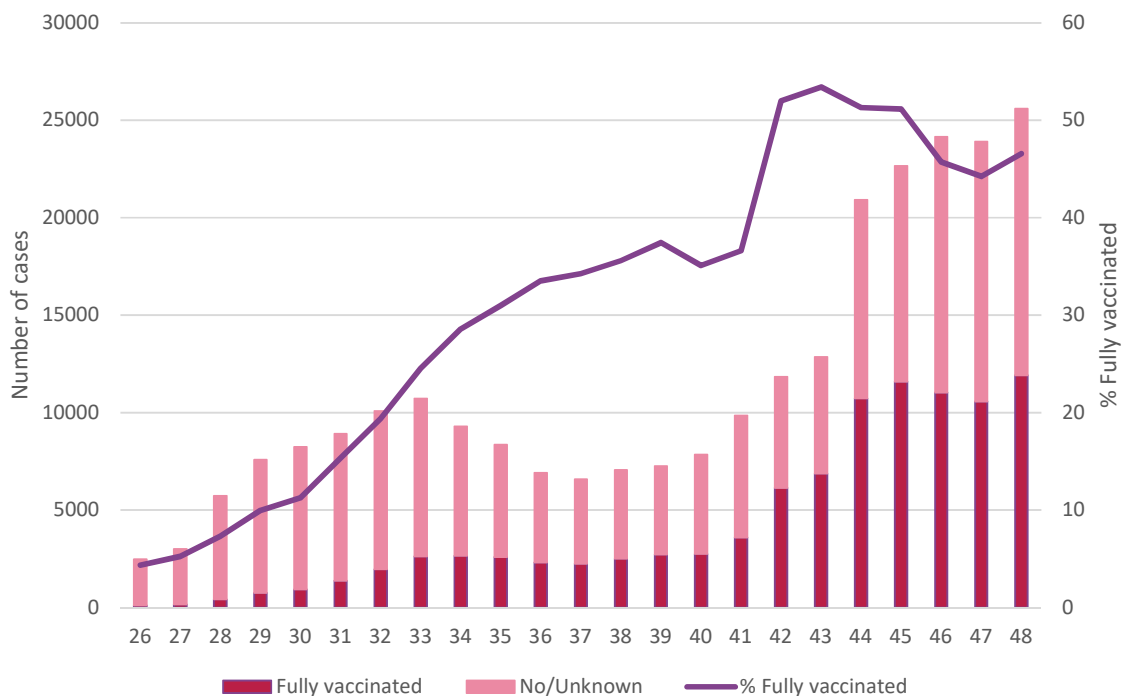


Figure 3. Number of laboratory confirmed cases of COVID-19 in those ≥12 years of age and whether fully vaccinated or not, notified in Ireland, 27th June and 4th December, 2021

Note: Number of cases fully vaccinated for the most recent week i.e. week 48 may be an underestimate due to time lag in establishing CIDR-COVAX linkages

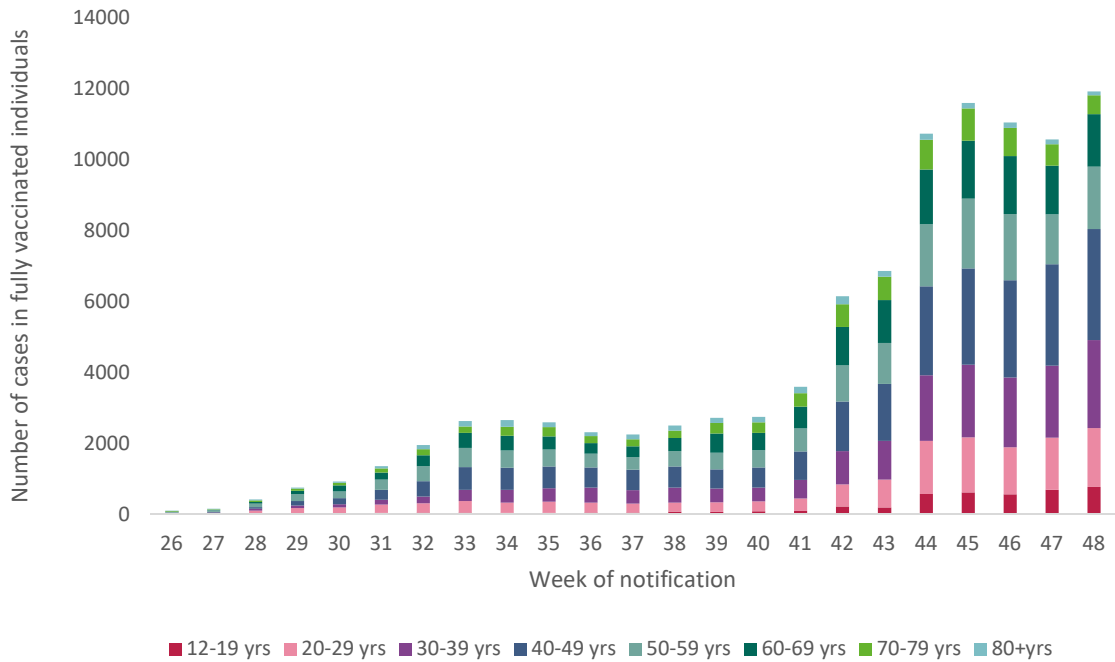


Figure 4a. Number of laboratory confirmed cases of COVID-19 in fully vaccinated individuals ≥ 12 years of age by age group and week, notified in Ireland, 27th June and 4th December, 2021

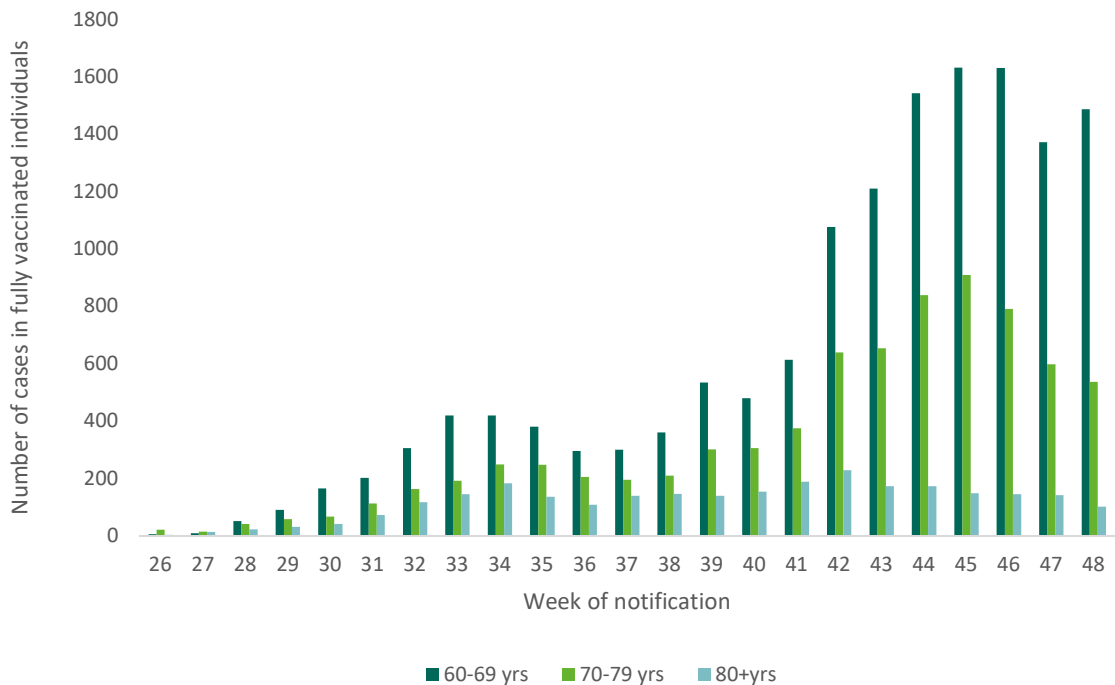


Figure 4b. Number of laboratory confirmed cases of COVID-19 in fully vaccinated individuals ≥ 60 years of age by age group and week, notified in Ireland, 27th June and 4th December, 2021

Table 3: Characteristics of laboratory confirmed cases of COVID-19 in those fully vaccinated ≥ 12 years of age, notified in Ireland, 27th June and 4th December, 2021

	Total cases		Hospitalised*		ICU		Deaths†		HCW	
	n	%	n	%	n	%	n	%	n	%
Fully vaccinated cases	98,594	100.00	2,493	2.5	236	0.2	437	0.4	6,174	6.3
Age group (years)										
12-19	4,451	4.5	17	0.7	1	0.4	0	0.0	83	1
20- 29	12,430	12.6	70	2.8	2	0.8	0	0.0	1354	22
30-39	16,558	16.8	126	5.1	2	0.8	1	0.2	1331	21.6
40-49	23,636	24.0	164	6.6	19	8.1	2	0.5	1,674	27.1
50-59	16,432	16.7	282	11.3	34	14.4	14	3.2	1238	20.1
60- 69	14,592	14.8	486	19.5	84	35.6	53	12.1	467	7.6
70-79	7,734	7.8	668	26.8	78	33.1	131	30.0	26	0.4
≥ 80	2,761	2.8	680	27.3	16	6.8	236	54.0	1	0.0
Sex										
F	52,871	53.6	1161	46.6	93	39.4	185	42.3	4,861	78.7
M	45,656	46.3	1332	53.4	143	60.6	252	57.7	1293	20.9
U	67	0.1	0	0.0	0	0.0	0	0.0	20	0.3
WGS result available	5,286	5.4	167	6.7	29	12.3	39	8.9	598	9.7
Most common variants‡										
AY.4 ((Delta)**	3,395	64.2	120	71.9	17	58.6	24	61.5	358	59.9
AY.5 (Delta)	341	6.5	4	2.4	1	3.4	3	7.7	32	5.4
AY.6	91	1.7	4	2.4	2	6.9	3	7.7	7	1.2
AY.9	192	3.6	3	1.8	0	0.0	0	0.0	23	3.8
B.1.617.2 (Delta sub-lineage not reported)	953	18.0	26	15.6	6	20.7	8	20.5	146	24.4
B.1.1.529	2	0.0	0	0.0	0	0.0	0	0.0	1	0.2
Median (range) time interval in days*†	111 (1-302)		134 (2-292)		114 (6-268)		156 (6-292)		163(1-297)	
25th, 75th percentile (days)	76, 141		95, 171		80, 145		118, 191		114, 225	
Interquartile range (days)	65		76		65		73		111	

*Hospitalised, cases where patient type was reported as “Hospital inpatient”

†Died, deaths in laboratory confirmed cases of COVID-19 and where cause of death was due to COVID-19

‡ % based on total sequenced

**Includes sub-lineages of AY.4

*†Time interval from being fully vaccinated (≥ 14 days since final dose) to infection

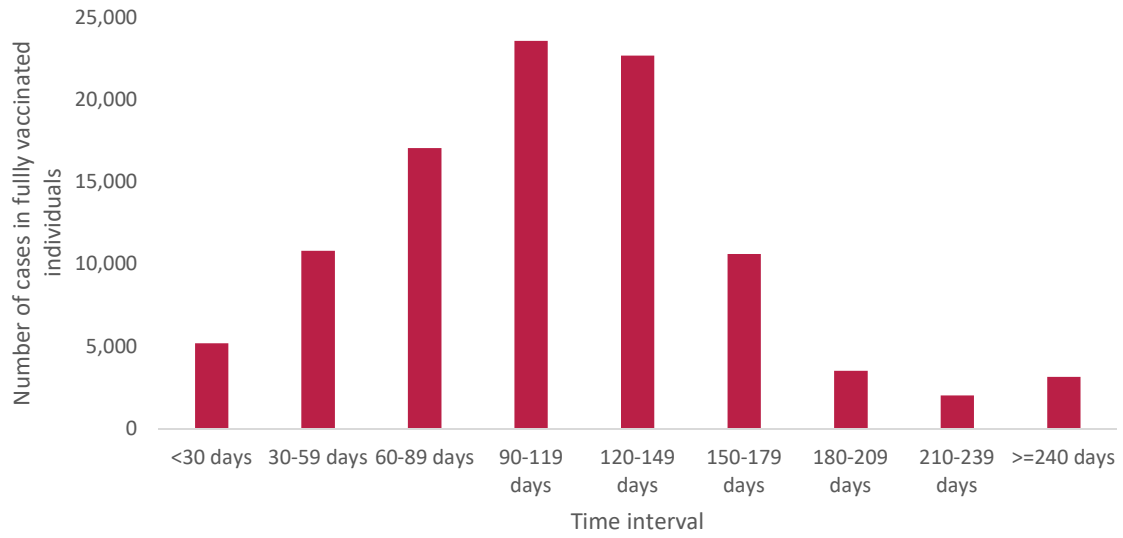


Figure 5. Time interval (days) from being fully vaccinated to infection in laboratory confirmed cases of COVID-19 in those ≥12 years of age, notified in Ireland, 27th June and 4th December, 2021

Vaccination status of recent cases - Weeks 45-48, 2021 7th November-4th December, 2021)

This section of the report focuses on cases notified during the last four weeks covered by this report, i.e. week 45-48, 2021. Among laboratory confirmed cases of COVID-19 notified in those ≥12 years of age between 7th November and 4th December, 2021:

- 96,289 cases in total were notified and 47% were fully vaccinated
- 1,366 (1.4%) of cases were hospitalised and 45% were fully vaccinated
- 136 (0.1%) of cases were admitted to ICU and 40% were fully vaccinated
- 115 (0.1%) of cases died (where cause of death due to COVID-19) and 51% were fully vaccinated
- 1,948 (2.0%) of cases were HCW and 68% were fully vaccinated

Details on vaccination status of cases are notified during last 4 weeks are presented in Table 4 and Figures 6, 7a and 7b.

Table 4. Vaccination status of laboratory confirmed cases of COVID-19 in those ≥12 years of age, notified in Ireland, 7th November and 4th December (Weeks 45-48) 2021

	All cases		Hospitalised*		ICU		Died†		HCWs	
	n	%	n	%	n	%	n	%	n	%
Fully vaccinated	45,124	46.9	620	45.4	54	39.7	59	51.3	1,318	67.7
Likely vaccinated ≥70yrs‡	851	0.9	79	5.8	5	3.7	18	15.7	0	0.0
Vaccinated – self reported 3 doses	2	0.0	0	0.0	0	0.0	0	0.0	2	0.1
Vaccinated – self reported 2 doses	7,988	8.3	137	10.0	2	1.5	8	7.0	391	20.1
Partially vaccinated	144	0.1	1	0.1	1	0.7	1	0.9	3	0.2
Vaccinated – self reported 1 dose	3,051	3.2	23	1.7	3	2.2	0	0.0	25	1.3
Vaccinated – self reported dose unknown	252	0.3	1	0.1	0	0.0	0	0.0	3	0.2
Not vaccinated**	10,801	11.2	263	19.3	57	41.9	17	14.8	157	8.1
Unknown *†	28,076	29.2	242	17.7	14	10.3	12	10.4	49	2.5
Total	96,289	100.0	1,366	100.0	136	100.0	115	100.0	1,948	100.0

*Hospitalised, cases where patient type was reported as “Hospital inpatient”

†Died, deaths in laboratory confirmed cases of COVID-19 and where cause of death was due to COVID-19

‡ Cases ≥70 years of age and vaccination status is unknown, these are assumed to be vaccinated since almost 100% uptake in this cohort

**In addition to unvaccinated, also includes cases not yet protected from vaccination i.e. cases with an epi date that was 0 to <14 days following first dose of a vaccine

*†Includes cases with insufficient vaccination details to categorise vaccination status or where no link has yet been established with COVAX

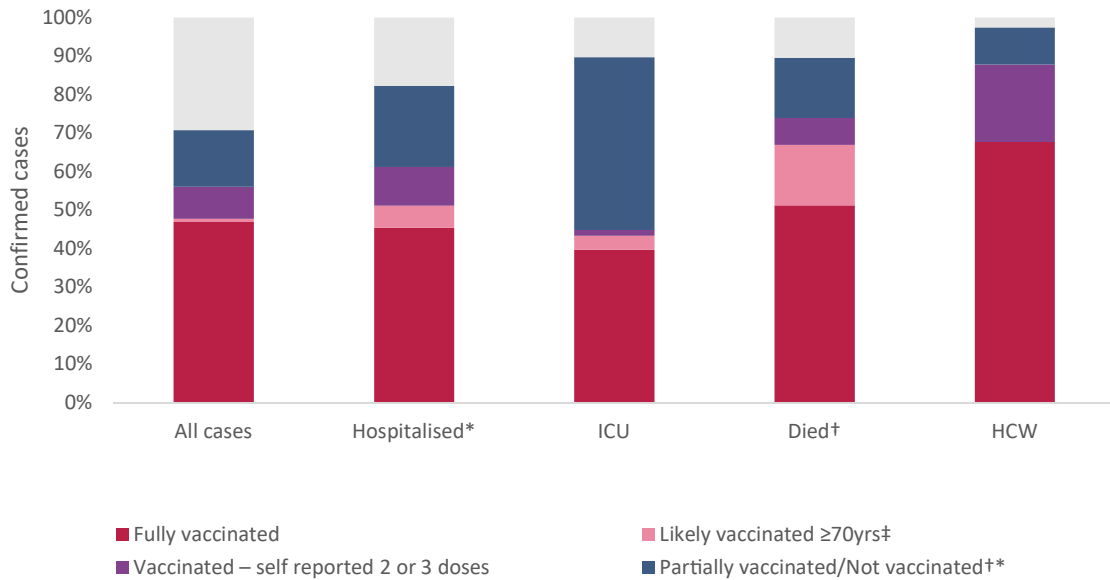


Figure 6. Vaccination status of laboratory confirmed cases of COVID-19 in those ≥12 years of age notified in Ireland, 7th November and 4th December (Weeks 45-48) 2021

*Hospitalised, cases where patient type was reported as “Hospital inpatient”

†Died, deaths in laboratory confirmed cases of COVID-19 and where cause of death was due to COVID-19

‡Cases ≥70 years of age and vaccination status is unknown, these are assumed to be vaccinated since almost 100% uptake in this cohort

†*Includes those classified as partially vaccinated, self-reported 1 dose, self-reported dose unknown and not vaccinated (i.e. unvaccinated and those not yet protected from vaccination i.e. cases with an epi date that was 0 to <14 days following first dose of a vaccine)

**Includes cases where insufficient vaccination details are available to categorise vaccination status or where no link has yet been established with COVAX

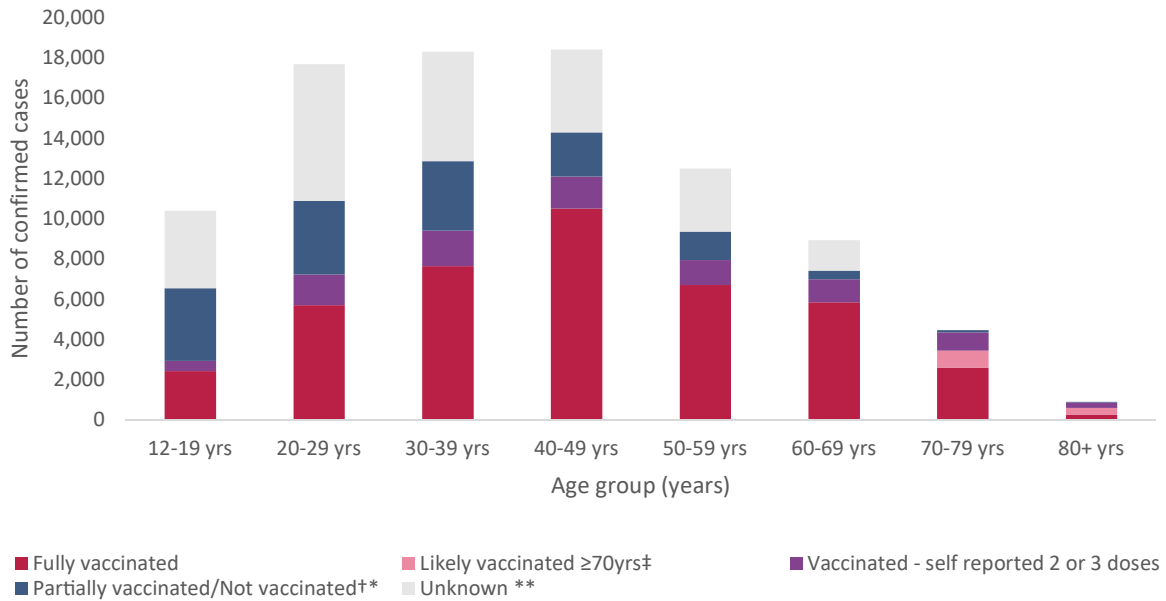


Figure 7a. Number of laboratory confirmed cases of COVID-19 in those ≥12 years of age by vaccination status and age group, notified in Ireland, 7th November and 4th December (Weeks 45-48) 2021

Please refer to footnotes provided under Figure 3.

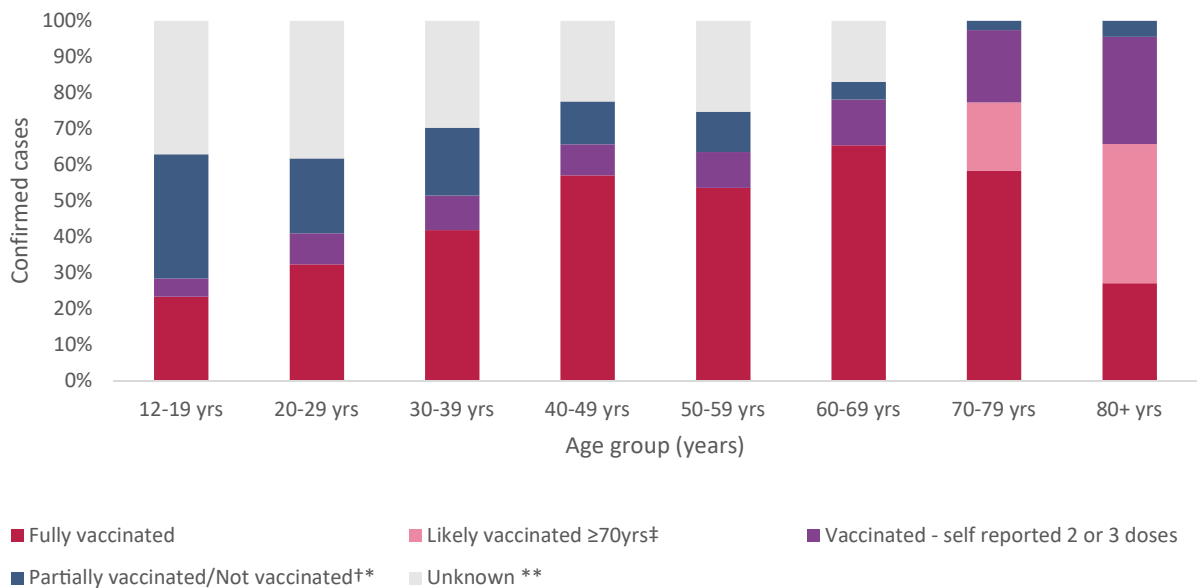


Figure 7b. Proportion of laboratory confirmed cases of COVID-19 in those ≥12 years of age by vaccination status and age group, notified in Ireland, 7th November and 4th December (Weeks 45-48) 2021

Please refer to footnotes provided under Figure 3.

Limitations

- Under ascertainment in the number of vaccinated cases reported due to the complexity of linking CIDR with COVAX records, this is hampered by the lack of unique health identifier on both systems and the inconsistent recording of first name, surnames and addresses on both systems. Efforts to improve data quality on both systems are ongoing but to have the greatest impact, the data collection systems used by the primary data collector need to be standardised and improved.
- Although in certain instances matching records were identified on COVAX, due to data quality issues these vaccination records from COVAX were not imported to CIDR (e.g. where dose 2 date preceded dose 1; where vaccine brand was recorded but no dates were provided).
- Under ascertainment in the number of fully vaccinated cases, due to missing data on brand names and vaccine dates among cases known to be vaccinated.
- Onset date and specimen date are not reported for all COVID-19 cases, epidemiological (epi) date is therefore used to determine the timing of SARS-CoV-2 infection. Epi date is based on the earliest of dates available on the case and taken from date of onset of symptoms, date of diagnosis, laboratory specimen collection date, laboratory received date, laboratory reported date or event creation date/notification date reported on Ireland's Computerised Infectious Disease Reporting System (CIDR). For some cases who were originally contacts and had multiple SARS-CoV-2 specimens taken, there may be uncertainty over their SARS-CoV-2 infection timelines.
- This surveillance report does not include data on SARS-CoV_2 cycle threshold (CT) values or serological testing. Further research assessing viral loads and serological testing in fully vaccinated individuals at an international level is needed.

Technical Notes

1. Data source

Data were extracted from CIDR on **14/12/2021 at 07:30** and were correct at the time. Data may change in future reports as further review and validation is carried out and further linkages established with COVAX records.

2. Definitions

2.1 Case definition

The COVID-19 case definition applied to notifications on CIDR is available at <https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/casedefinitions/>

2.2 Epidemiological (Epi) date

Epidemiological date (epi date) is used to determine timing of SARS-CoV-2 infection. Epi date is based on the earliest of dates available on the case and taken from date of onset of symptoms, date of diagnosis, laboratory specimen collection date, laboratory received date, laboratory reported date or event creation date/notification date reported on CIDR.

2.3 Vaccination status

For the purposes of surveillance, vaccination status of cases is as follows:

- **Fully vaccinated** if:
 - they had completed the recommended vaccine schedule (i.e. 1 dose of a 1-dose regimen or 2 doses of a 2-dose regimen) and the epidemiological date is ≥ 14 days after receipt of the final dose. A case categorised as fully vaccinated is classified as a BTI.
- **Partially vaccinated** if:
 - they received one dose of a two-dose regimen and the epidemiological date is ≥ 14 days after receipt of this first dose or;
 - they completed the vaccine schedule and the epidemiological date is ≤ 14 days after receipt of the final dose
- **Vaccinated – self report dose 3** if:
 - they self-reported as having received three doses during the patient interview but a matching COVAX record has not yet been identified. Insufficient information is available to ascertain exact vaccination status of these cases
- **Vaccinated – self report dose 2** if:
 - they self-reported as having received two doses during the patient interview but a matching COVAX record has not yet been identified. Insufficient information is available to ascertain exact vaccination status of these cases

- **Vaccinated – self report dose 1 if:**
 - they self-reported as having received one dose during the patient interview but a matching COVAX record has not yet been identified. Insufficient information is available to ascertain exact vaccination status of these cases
- **Vaccinated – self report dose unknown if:**
 - they self-reported as having been vaccinated, however, number of doses received was not reported during the patient interview but a matching COVAX record has not yet been identified. Insufficient information is available to ascertain exact vaccination status of these cases
- **Not vaccinated if:**
 - vaccination record on COVAX indicate they were vaccinated after being diagnosed with COVID-19
 - they self-reported as not vaccinated during the patient interview or other source reported patient was not vaccinated
 - they received one dose of either a one-dose or two-dose regimen and the epidemiological date is <14 days after receipt of this first dose
- **Unknown/Unlinked if:**
 - none of the above criteria are met to determine vaccination status because the case is not yet linked with a matching record on COVAX or there are no data or insufficient data available to determine vaccination status. Many of these cases may be unvaccinated but there is insufficient data available to classify as such.
- **Likely vaccinated >70 years if:**
 - there is no indication of vaccination status (on COVAX or self-reported), in this instance cases aged 70 years or older are assumed to be vaccinated due to the very high uptake (~100%) among this age group in Ireland.

Acknowledgements

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Appendix 1 – Vaccination status of cases by month, July – 4th December, 2021

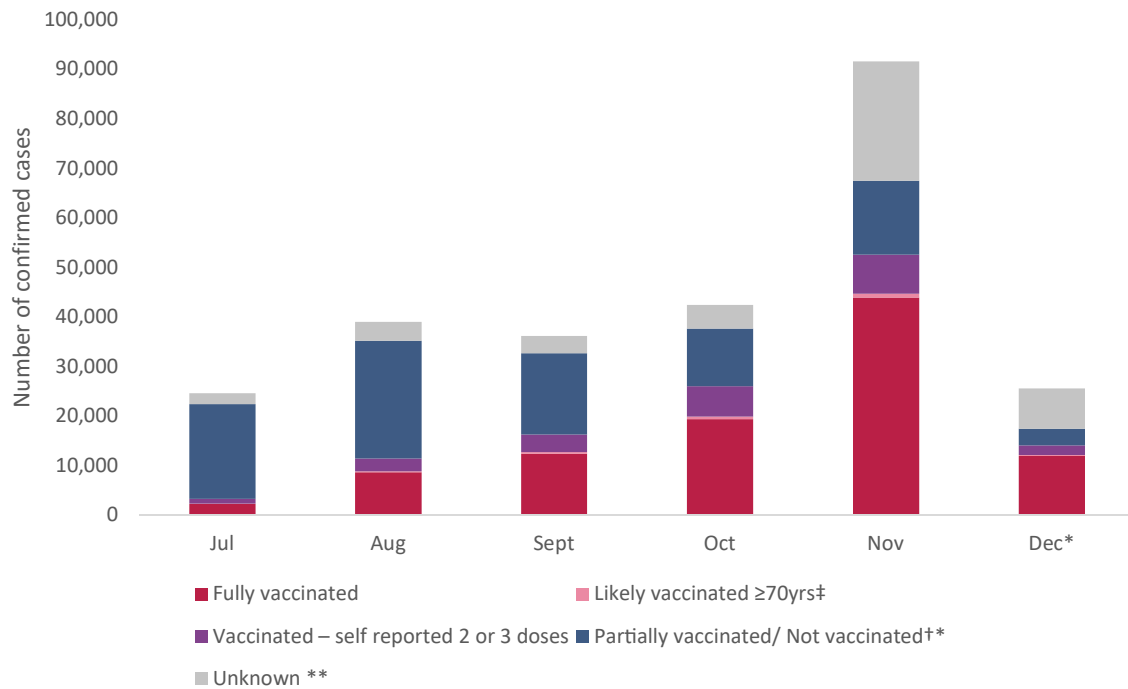


Figure A1: Vaccination status by month of confirmed cases of COVID-19, notified in Ireland July-December 2021

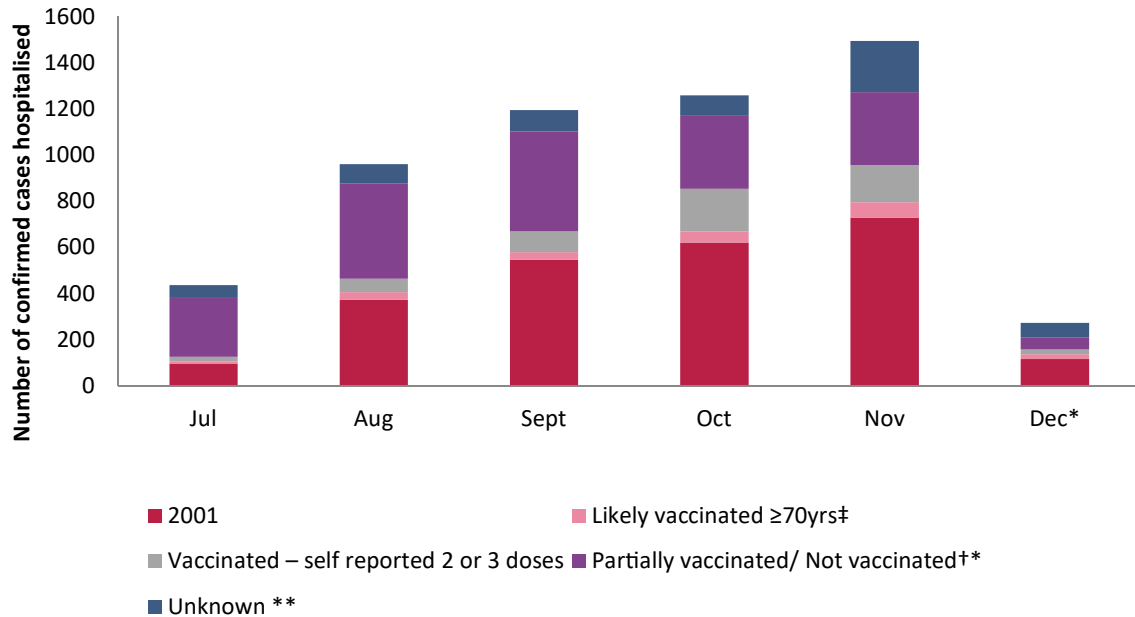


Figure A2: Vaccination status by month of confirmed cases of COVID-19 who were hospitalised, notified in Ireland July- December 2021

*For cases notified up to and including 4th December 2021 only
See Figure 1 for additional footnotes

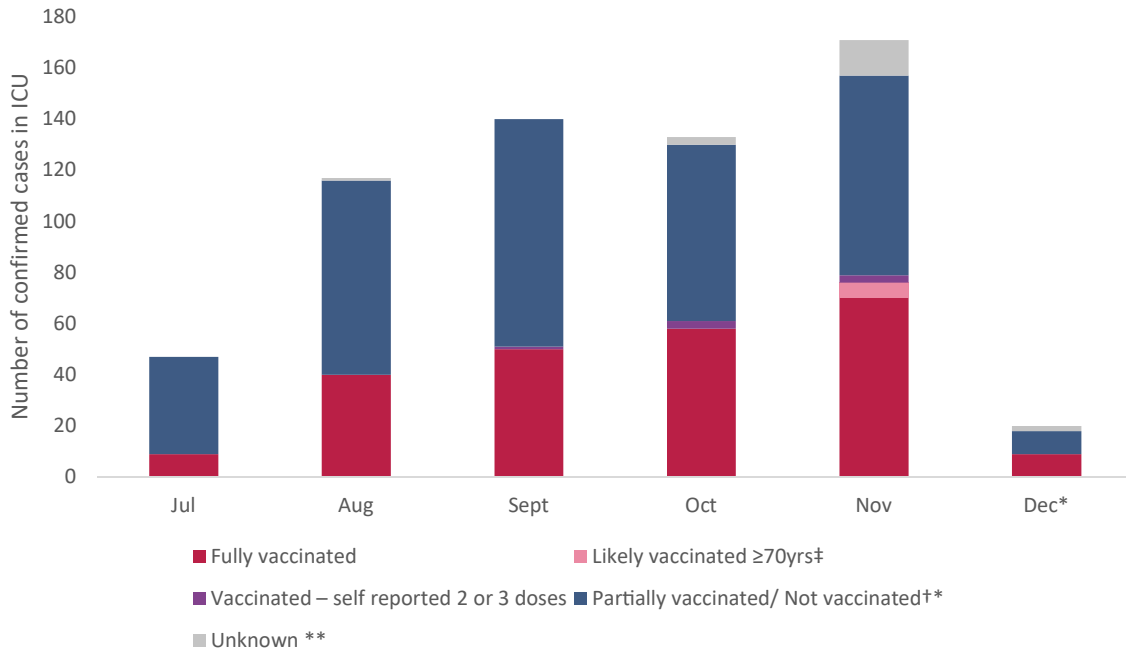


Figure A3: Vaccination status by month of confirmed cases of COVID-19 admitted to ICU, notified in Ireland July-December 2021

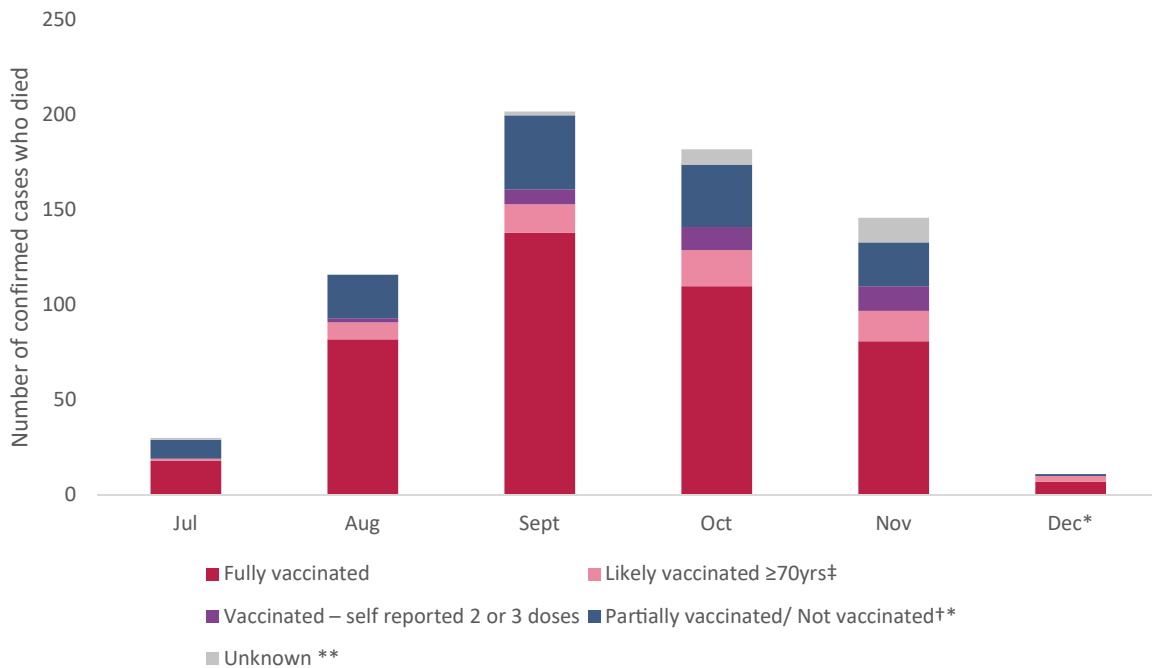


Figure A4: Vaccination status by month of laboratory confirmed cases of COVID-19 who died due to COVID-19, notified in Ireland July-December 2021

*For cases notified up to and including 4th December 2021 only
 See Figure 1 for additional footnotes