

## Analysis of Data Published in the Internet by the Ministry of Health of Northern Ireland on Covid-19 Vaccinations, Hospitalisations and Deaths for the Period 30<sup>th</sup> August to 19<sup>th</sup> December 2021

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### ABSTRACT

Analysis of data from the Department of Health of Northern Ireland for the period 30<sup>th</sup> August to 19<sup>th</sup> December 2021 showed significant beneficial effects of COVID-19 vaccination in reducing the percentages of COVID-19 cases admitted to hospital and COVID-19 deaths in all age cohorts of the population. In the studied period Northern Ireland had a very high percentage of population fully vaccinated against COVID-19, 77% of the population below 50 and 93% of the population over 50 years of age. As an example of the beneficial effects of vaccination, in the “60-69” age cohort the percentage hospitalised with COVID-19 was 2.40% for not vaccinated and only 0.18% for the fully vaccinated. The percentage deaths from COVID-19 for the “60-69” not vaccinated population were 0.28%, for the fully vaccinated 0.03%. Unexpectedly, the percentages of deaths from COVID-19 cases admitted to hospital were lower for not vaccinated patients in the age cohorts “18-49”, “50-59”, “60-69”, “50 and over” and “all adults”, compared to the fully vaccinated in the same age cohort: “18-49”, 2.1% deaths “not vaccinated”, 4.3% deaths “fully vaccinated”; “50-59”, 5.8% deaths “not vaccinated”, 8.1% deaths “fully vaccinated”; “60-69”, 11.9% deaths “not vaccinated”, 16.5% deaths “fully vaccinated” and “50 and over”, 17.8% deaths “not vaccinated”, 21.7% deaths “fully vaccinated”. The difference was the highest for the “all adults” cohort: 10.5% deaths in the not vaccinated COVID-19 hospitalized patients and 20.2% deaths in the fully vaccinated group.

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### Introduction

Starting August 2021, the Ministry of Health of Northern Ireland published in the Internet documents entitled “COVID-19 in Northern Ireland - Vaccination Status of Deaths and Hospitalisations”. Four of these documents covered without overlap the period 30<sup>th</sup> August to 19<sup>th</sup> December 2021 (Weeks 35-38 [1], 39-42 [2], 43-46 [3], 47-50 [4]), showing, for different age groups, the vaccination status of the COVID-19 cases admitted to hospital (Tables 1 in [1-4]), and the number of COVID-19 deaths within 28 days of a positive test (Tables 2 in [1-4]). Addition of the data in documents [1-4] gives the total number of hospitalisations with COVID-19 and the total number of deaths from COVID-19 in Northern Ireland for the 112-day period, (Table 1). The data show that for patients over 50, the number of hospitalised cases as well as the number of deaths, is higher for the fully vaccinated cohorts [1-4]. These observations are explained in the Northern Ireland Ministry of Health documents [1-3] as follows: “These results should be interpreted in the context of vaccine coverage in the Northern Ireland population (Figures 1 and 2). The success of the vaccination programme has resulted in a very small percentage of unvaccinated individuals, particularly for the older age cohorts. When there is very high vaccine coverage in the population, even with a highly effective vaccine, it is expected that a large proportion of cases, hospitalisations and deaths would occur in vaccinated individuals. This is simply because a larger proportion of the population are vaccinated than unvaccinated and no vaccine

is 100% effective. This is especially true because vaccination has been prioritised in individuals who are more susceptible or more at risk of severe disease. Individuals in risk groups may also be more at risk of hospitalisation or death due to non-COVID-19 causes, and thus may be hospitalised or die with COVID-19 rather than because of COVID-19.”

### Analysis of Data Published in the Internet

#### Analysis of Hospitalisations and Deaths in Age Cohort Populations

Northern Ireland has a very high percentage of population vaccinated against COVID-19: the vaccines administered until 1 January 2022 were 51.2% Pfizer/BioNTech, 47% AstraZeneca and 1.8% Moderna [5]. In the studied period, fully vaccinated persons represented 77% in age group “18-49”, 93% in “50-59”, 94% in “60-79” and 89% in “80 and over” (Table 2). About 95.4% COVID-19 deaths in Northern Ireland occurred in hospitals [6]. Thus the data in Table 1, covering 95.4% of cases, were used to analyse the percentages of the whole population who have been hospitalised with COVID-19 and of those who have died from COVID-19 (Table 3, Figures 1).

The data show that the “fully vaccinated” and the “one dose only” groups have significantly reduced numbers of hospitalisations relative to their population cohort compared to the not vaccinated,

for all cohorts (between 1.1 to 20 times less) (Table 3, Figure 1a). The “50-59” age cohort had the highest difference between “not vaccinated” and “fully vaccinated” (20 times) in the percentage hospitalisation relative to cohort’s population: 1.96% hospitalisations for “not vaccinated”, 0.1% hospitalisations for “fully vaccinated” (Table 3). The smallest difference (1.1 times) was for the “80 and over” age cohort: 1.37% hospitalisations for “not vaccinated”, 1.22% hospitalisations for “fully vaccinated” (Table 3).

As expected, significant beneficial effects of COVID-19 vaccination were observed in reducing the percentages of COVID-19 deaths for all cohort populations. The % deaths relative to the population of the cohort was smaller in the “fully vaccinated” groups (2 to 11 times less) and (1.2 to 6 times less) in the “one dose only” groups (Table 3, Figure 1b). The highest beneficial effects of vaccination were in the “50-59” age cohort where the “fully vaccinated” had an 11 times lower % deaths relative to population compared to the “not vaccinated”.

### Analysis of Deaths in Hospitalised Patients

Unexpectedly, for the age cohorts “18-49”, “50-59”, “60-69”, and “50 and over” the percentages of deaths were lower for the not vaccinated COVID-19 patients admitted to hospital when compared to fully vaccinated hospitalised: “18-49”, 2.1% deaths “not vaccinated”, 4.3% deaths “fully vaccinated”; “50-59”, 5.8% deaths “not vaccinated”, 8.1% deaths “fully vaccinated”; “60-69”, 11.9% deaths “not vaccinated”, 16.5% deaths “fully vaccinated” and “50 and over”, 17.8% deaths “not vaccinated”, 21.7% deaths “fully vaccinated” (Table 1, Figure 1c). The difference was the highest for the “all adults” cohort: 10.5% of not vaccinated who were hospitalised died, compared to 20.2% of fully vaccinated hospitalised who died (Table 1, Figure 1c).

Only for the age cohorts “70-79” and “80 and over” the percentage deaths from COVID-19 in hospitalised patients was smaller for the “fully vaccinated” and “one dose only” when compared to the “not vaccinated” from the same cohorts (Table 1). However, the percentage deaths for the elderly population were high: in the “70-79” age cohort 18.9% died from “fully vaccinated” hospitalised patients, and 25.0% died from the “not vaccinated” hospitalised patients; in the “80 and over” age group 30.0% died from the “fully vaccinated” hospitalised patients and 53.2% died from not vaccinated hospitalised patients (Table 1, Figure 1c).

### Discussion

The COVID-19 cases in Northern Ireland during the studied period, (30<sup>th</sup> August - 19<sup>th</sup> December 2021), were mainly the Delta corona virus variant. Only data from report [4], covering the period 22<sup>nd</sup> November to 19<sup>th</sup> December, could include Omicron infections [4]. The Omicron variant was first reported from South Africa on 24<sup>th</sup> November 2021[7] and in the United Kingdom on 13<sup>th</sup> December, when it was 9.4% of all variants, reaching 65.6% on 27<sup>th</sup> December 2021 [7, 8]. Northern Ireland had a very high percentage of population fully vaccinated against COVID-19: 77% of the population below 50 and 93% of the population over 50 (Table 2). The vaccines used were Pfizer/BioNTech (51.2%), AstraZeneca (47%) and Moderna (1.8%) [5].

In all age cohort populations, the percentages of hospitalisation with COVID-19 and of death from COVID-19 were smaller for the “fully vaccinated” and “one dose only” groups, compared to the “not vaccinated” (Figures 1a, 1b). It was unexpected that for hospitalised patients the number of deaths for the “not vaccinated”

cohorts was lower compared to the “fully vaccinated” in the age groups “18-49”, “50-59”, “60-69”, “50 and over”, and in “all adults” (Table 3, Figure 1c). Although referring to infection and not death, for the Omicron variant it was recently reported that fully COVID-19 vaccinated patients were 42% less protected from infection (-42% vaccine efficacy) compared to not vaccinated [9].

One possible explanation for the increased number of COVID-19 deaths in fully vaccinated hospitalised patients may be the development of COVID-19 vaccination associated adverse immune responses such as vaccine-associated enhanced disease (VAED) and vaccine-associated enhanced respiratory disease (VAERD). The possible adverse events VAED and VAERD are under ongoing vaccine regulatory surveillances. For all mRNA and DNA COVID-19 vaccines approved by the European Medicines Agency, VAED and VAERD are included in the Risk Management Plans [10-13]. For example, in the Pfizer/BioNTech Risk Management Plans from 25 November 2021, VAED, including VAERD, is considered the only “important potential risk”, Module SVII.1.2. in [10] “Although not observed or identified in clinical studies with COVID-19 vaccines, there is a theoretical risk, mostly based on non-clinical betacoronavirus data, of VAED occurring either before the full vaccine regimen is administered or in vaccinees who have waning immunity over time. If VAED were to be identified as a true risk, depending on its incidence and severity, it may negatively impact the overall vaccine benefit risk assessment for certain individuals” [10]. And, in Table 5 from the Pfizer/BioNTech RMP [10] the conclusions are: “VAED may present as severe or unusual clinical manifestations of COVID-19, overall, there were 425 subjects with confirmed COVID-19 following one or both doses of the vaccine; 288 of the 425 cases were severe, resulting in hospitalization, disability, life threatening consequences or death. None of the 288 cases could be definitively considered as VAED/VAERD. The review of subjects with COVID-19 following vaccination, based on the current evidence, VAED/VAERD may remain a theoretical risk for the vaccine. Surveillance will continue” [10].

The observed increased number of COVID-19 deaths in “fully vaccinated” hospitalised patients could have other possible origins besides the theoretical risk of VAED/VAERD, stimulating hypotheses and questions such as: i) for the same age cohort are there differences between the “not vaccinated” and “fully vaccinated” patients in their general health and underlying diseases?; ii) are there vaccine-type differences in the deaths in “fully vaccinated” hospitalised patients? iii) could medical treatments be adapted to age groups to improve the survival rates?; iv) are there patient pre-existing conditions (e.g. asthma) which may contribute to the observed effects?

Further analysis of COVID-19 deaths in hospitalised patients, similar to the one presented here for Northern Ireland, together with medical and immunological investigation, will help to understand the relations between vaccination, hospitalisation and deaths for COVID-19 patients and may contribute to the development of better vaccines and therapies.

### Summary

An overview of the data analysis performed in this paper is presented in the Summary Boxes in Table 4. The box representation permits a fast, easy way to compare in each age cohort the not vaccinated and fully vaccinated groups. It enables non-specialists to evaluate the risks of COVID-19 disease and the benefits of vaccination.

Number of Hospitalisations and Deaths in Northern Ireland Between 30 <sup>th</sup> August and 19 <sup>th</sup> December 2021										
Age Cohort	Time Period Weeks	Number of Patients Hospitalised with COVID-19			Number of Patients Who Died from COVID-19			% Deaths from COVID-19 from Hospitalised Patients		
		Not Vaccinated	First Dose Only	Fully Vaccinated	Not Vaccinated	First Dose Only	Fully Vaccinated	Not Vaccinated	First Dose Only	Fully Vaccinated
18-49	35-38	176	13	38	4	0	1	2.3	0.0	2.6
	39-42	136	6	37	3	0	1	2.2	0.0	2.7
	43-46	101	4	55	3	0	3	3.0	0.0	5.5
	47-50	117	6	54	1	0	3	0.9	0.0	5.6
	Total	530	29	184	11	0	8	2.1	0.0	4.3
50-59	35-38	56	7	63	6	2	7	10.7	28.6	11.1
	39-42	54	7	50	2	2	2	3.7	28.6	4.0
	43-46	54	6	53	2	0	5	3.7	0.0	9.4
	47-50	59	2	56	3	0	4	5.1	0.0	7.1
	Total	223	22	222	13	4	18	5.8	18.2	8.1
60-69	35-38	64	5	79	5	1	13	7.8	20.0	16.5
	39-42	43	4	56	3	0	13	7.0	0.0	23.2
	43-46	29	3	115	9	0	15	31.0	0.0	13.0
	47-50	41	5	60	4	1	10	9.8	20.0	16.7
	Total	177	17	310	21	2	51	11.9	11.8	16.5
70-79	35-38	39	16	196	10	3	50	25.6	18.8	25.5
	39-42	27	3	182	10	0	15	37.0	0.0	8.2
	43-46	32	7	180	5	2	37	15.6	28.6	20.6
	47-50	34	2	81	8	4	19	23.5	-	23.5
	Total	132	26	639	33	5	121	25.0	19.2	18.9
80 & over	35-38	19	18	251	12	4	70	63.2	22.2	27.9
	39-42	17	15	194	9	4	52	52.9	26.7	26.8
	43-46	20	8	213	11	5	76	55.0	62.5	35.7
	47-50	23	<u>3</u>	126	10	<u>6</u>	37	43.5	-	29.4
	Total	79	41	784	42	13	235	53.2	31.7	30.0
50 & over	35-38	178	46	589	33	10	140	18.5	21.7	23.8
	39-42	141	29	482	24	6	82	17.0	20.7	17.0
	43-46	135	24	561	27	7	133	20.0	29.2	23.7
	47-50	157	7	323	25	1	70	15.9	14.3	21.7
	Total	611	106	1955	109	24	425	17.8	22.6	21.7
All Adults	35-38	354	59	627	37	10	141	10.5	16.9	22.5
	39-42	277	35	519	27	6	83	9.7	17.1	16.0
	43-46	236	28	616	30	7	136	12.7	25.0	22.1
	47-50	274	13	377	26	1	73	9.5	7.7	19.4
	Total	1141	135	2139	120	24	433	10.5	17.8	20.2

**Table 1:** The numbers of patients hospitalised with COVID-19 and the numbers of those who have died from COVID-19 in Northern Ireland between 30<sup>th</sup> August and 19<sup>th</sup> December 2021 are from Tables 1 and 2 in [1- 4]. The “Total” numbers in the table were calculated. For the period “Weeks 47-50” the numbers of “First Dose Only” for “70-79” and “80 and over” (in italics, underlined) were not considered, are likely typing mistakes in [4], i.e., the number of deaths in hospital is tabulated as larger than the number of persons hospitalised. Also, we included in the period “Weeks 47-50” in the “Fully Vaccinated” groups the “Fully Vaccinated + Booster or Dose 3” [4]. The numbers for adults under 50 were obtained by adding the number of cases for the age cohorts “18-29”, “30-39”, “40-49”, (Tables 1 and 2 in [1-4]). The % deaths from COVID-19 from hospitalised patients were calculated from the data in the first two columns.

Vaccination Status of Adult Age Groups in Northern Ireland Between 30 <sup>th</sup> August and 19 <sup>th</sup> December 2021					
Age Cohort	% Population N. Ireland	% First Dose Including Fully Vaccinated	% Fully Vaccinated	% One Dose Only	% Not Vaccinated
18-29	13.9	76	67	9	24
30-39	13.4	82	75	7	18
40-49	14.6	90	89	1	10
Under 50	41.9	83 <sup>a)</sup>	77	6	17
50-59	12.0	95	93	2	5
60-69	9.7	96	94	2	4
70-79	6.3	96	94	2	4
80 & Over	3.8	92	89	3	8
50 & Over	31.8	95	93	2	5
All Adults	73.7	88	84	4	12

**Table 2:** Mean % values of vaccinations status for different age groups of Northern Ireland’s adult population in the period 30<sup>th</sup> August through 19<sup>th</sup> December 2021 (Weeks 35 to 50).

Column 2: Northern Ireland population is about 1.9 million; the % population for the age groups are from [14]. Columns 3 and 4: cumulative percentages of “% First Dose Including Fully Vaccinated” and “% Fully Vaccinated” were calculated from Figures 1 and 2 in [4]. Data in columns 5 and 6 were calculated from columns 3 and 4.

Column 5: (“% One Dose Only”) = (“% First Dose Including Fully Vaccinated”) – (“% Fully Vaccinated”). Column 6: (“% Not Vaccinated”) = 100 – (“% First Dose Including Fully Vaccinated”). For the broad age groups “Under 50”, “50 and over” the weighted arithmetic mean of the % values of vaccinations status (V) were calculated with the formula:  $V = (V_1 P_1 + V_2 P_2 + V_3 P_3) / (P_1 + P_2 + P_3)$  where  $V_1, V_2, V_3$  are the mean % values for the vaccination of the small age groups contained in the broad age group, and  $P_1, P_2, P_3$  are the corresponding percentages of the small age groups in the country’s population.

**Example:**

a)  $V$  (first dose “under 50”) =  $((76 \times 13.9) + (82 \times 13.4) + (90 \times 14.6)) / (13.9 + 13.4 + 14.6) = 82.8\%$

The weighted arithmetic mean for “All Adults” was calculated from the weighted arithmetic means of the “Under 50”, and “50 and over” age cohorts.

Percentages of Hospitalisations and Deaths from Age Cohort Population									
Age Cohort	% Hospitalisation with COVID-19 from Age Cohort Population			% Deaths from COVID-19 from Age Cohort Population			% Deaths from COVID-19 from Hospitalised Patients		
	Not Vaccinated	First Dose Only	Fully Vaccinated	Not Vaccinated	First Dose Only	Fully Vaccinated	Not Vaccinated	First Dose Only	Fully Vaccinated
18-49	0.39	0.06	0.03	0.010	0.000	0.001	2.1	0.0	4.3
50-59	1.96	0.48	0.10	0.11	0.09	0.01	5.8	18.2	8.1
60-69	2.40	0.46	0.18	0.28	0.05	0.03	11.9	11.8	16.5
70-79	2.76	1.09	0.57	0.69	0.21	0.11	25.0	19.2	18.9
80 and over	1.37	1.89	1.22	0.73	0.60	0.37	53.2	31.7	30.0
50 and over	2.02	0.88	0.35	0.36	0.20	0.08	17.8	22.6	21.7
All Adults	0.68	0.24	0.18	0.07	0.04	0.04	10.5	17.8	20.2

**Table 3:** Percentages of persons from different age groups and vaccination status who have been hospitalised with COVID-19 and of those who have died from COVID-19 in Northern Ireland between 30<sup>th</sup> August and 19<sup>th</sup> December 2021.

“% Hospitalisation with COVID-19 from Age Cohort Population”, H, was calculated with the formula:

$H = (NrH \times 100) / ((V/100) \times (P/100) \times C)$

Where NrH is the number hospitalized in the age cohort, data in Table 1;

V, the mean % value for the vaccination status of the group (“Not Vaccinated”, “One Dose Only”, or “Fully Vaccinated”), in the age group, data in Table 2;

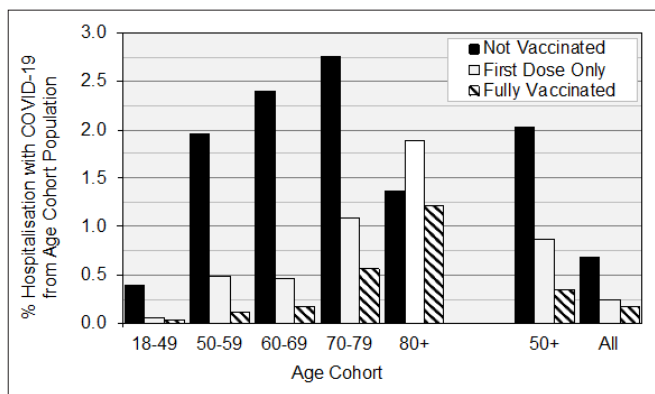
P is the % age cohort in the country’s population, data in Table 2;

C is the country population, 1.9 million for Northern Ireland.

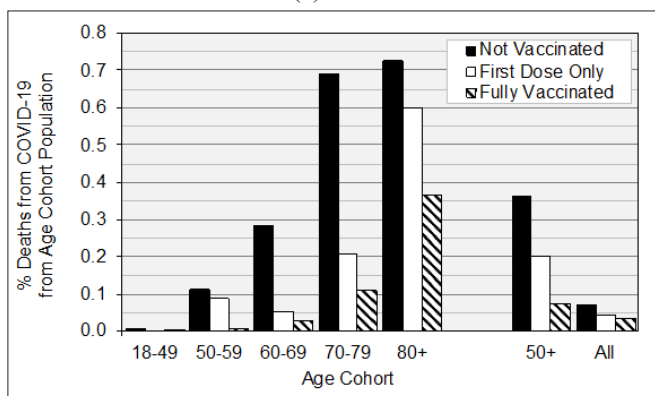
“% Deaths from COVID-19 from Age Cohort Population”, D, was calculated with the formula:

$D = (NrD \times 100) / ((V/100) \times (P/100) \times C)$

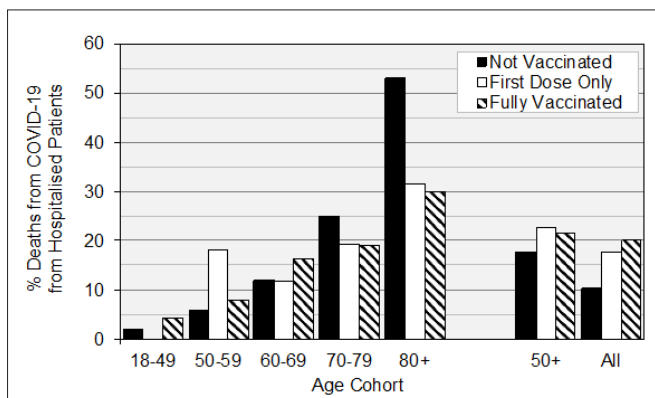
NrD is the number of deaths in the age cohort, data in Table 1.



(a)



(b)



(c)

**Figure 1:** a) Vaccination status and the percentages of population of age cohorts hospitalised with COVID-19. b) Vaccination status and the percentages of population of age cohorts that died from COVID-19. c) Vaccination status and the percentages of population from hospitalised patients that died from COVID-19. Data for Northern Ireland between 30th August and 19th December 2021, Table 3.

Age Group: Adults Under 50	Not Vaccinated	First Dose Only	Fully Vaccinated
Persons hospitalised with COVID-19 from 1'000 persons in the population	4	0.6	0.3
Persons who died from COVID-19 from 1'000 persons in the population	0.1	0	0.01
Persons who died from COVID-19 from 100 hospitalised persons	2	0	4

(a)

Age Group: 50-59	Not Vaccinated	First Dose Only	Fully Vaccinated
Persons hospitalised with COVID-19 from 1'000 persons in the population	20	5	1
Persons who died from COVID-19 from 1'000 persons in the population	1	1	0.1
Persons who died from COVID-19 from 100 hospitalised persons	6	18	8

(b)

Age Group: 60-69	Not Vaccinated	First Dose Only	Fully Vaccinated
Persons hospitalised with COVID-19 from 1'000 persons in the population	24	5	2
Persons who died from COVID-19 from 1'000 persons in the population	3	0.5	0.3
Persons who died from COVID-19 from 100 hospitalised persons	12	12	17

(c)

Age Group: 70-79	Not Vaccinated	First Dose Only	Fully Vaccinated
Persons hospitalised with COVID-19 from 1'000 persons in the population	28	11	6
Persons who died from COVID-19 from 1'000 persons in the population	7	6	4
Persons who died from COVID-19 from 100 hospitalised persons	25	19	19

(d)

Age group: 80 and Over	Not Vaccinated	First Dose Only	Fully Vaccinated
Persons hospitalised with COVID-19 from 1'000 persons in the population	14	19	12
Persons who died from COVID-19 from 1'000 persons in the population	7	6	4
Persons who died from COVID-19 from 100 hospitalised persons	53	32	30

(e)

Age group: 50 and Over	Not Vaccinated	First Dose Only	Fully Vaccinated
Persons hospitalised with COVID-19 from 1'000 persons in the population	20	9	4
Persons who died from COVID-19 from 1'000 persons in the population	4	2	1
Persons who died from COVID-19 from 100 hospitalised persons	18	23	22

(f)

Age group: All Adults	Not Vaccinated	First Dose Only	Fully Vaccinated
Persons hospitalised with COVID-19 from 1'000 persons in the population	7	2	2
Persons who died from COVID-19 from 1'000 persons in the population	0.7	0.4	0.4
Persons who died from COVID-19 from 100 hospitalised persons	11	18	20

(g)

**Table 4:** Summary boxes, simplified presentation per age group of the data in Table 3 on the vaccination status and the percentages of population who have been hospitalised with COVID-19 and of those who have died from COVID-19 between 30th August and 19th December 2021.

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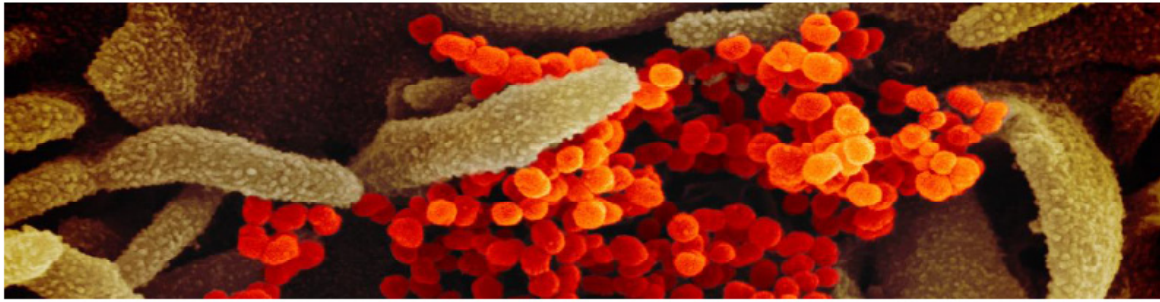
### Conflicts of Interest

There are no conflicts of interest to declare.

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## Supplementary Files



<https://www.health-ni.gov.uk/sites/default/files/publications/health/doh-vaccination-status-weeks-35-38.pdf>

# COVID-19 in Northern Ireland

## Vaccination Status of Deaths and Hospitalisations

Weeks 35 to 38 (30<sup>th</sup> August to 26<sup>th</sup> September 2021)

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Department of  
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### Summary

- The COVID-19 vaccination program for Northern Ireland began in December 2020. By September 2021 approximately 2.5 million doses of the vaccine have been administered, with 88% of adults receiving their first dose and 82% receiving their second dose.
- Ongoing monitoring of vaccine performance is necessary to support Public Health policy as the vaccination program progresses.
- This report presents results for Northern Ireland on the vaccination status of patients who have been hospitalised from COVID-19 and of those who have died from COVID-19 for weeks 35 to 38 (30<sup>th</sup> August to 26<sup>th</sup> September 2021).

#### Hospital Admissions

- Three-quarters of adult inpatients aged under 50 are unvaccinated. 22% of inpatients aged 50 and over are unvaccinated.
- Unvaccinated individuals aged 50 and over are **5 times** as likely to be admitted to hospital than fully vaccinated individuals.
- For adults under 50, whilst the numbers admitted to hospital are lower, an unvaccinated individual is almost **18 times** as likely to need hospitalisation.

#### Deaths

- Unvaccinated individuals aged 50 and over are almost **4 times** as likely to die.
- These results should be interpreted in the context of vaccine coverage in the Northern Ireland population (**Figures 1 and 2**). The success of the vaccination programme has resulted in a very small percentage of unvaccinated individuals, particularly for the older age cohorts. When there is a very high vaccine coverage in the population, even with a highly effective vaccine, it is expected that a large proportion of cases, hospitalisations and deaths would occur in vaccinated individuals. This is simply because a larger proportion of the population are vaccinated than unvaccinated and no vaccine is 100% effective. This is especially true because vaccination has been prioritised in individuals who are more susceptible or more at risk of severe disease. Individuals in risk groups may also be more at risk of hospitalisation or death due to non-COVID-19 causes, and thus may be hospitalised or die with COVID-19 rather than because of COVID-19. Death and admissions rates per 100,000 should therefore be interpreted with caution.

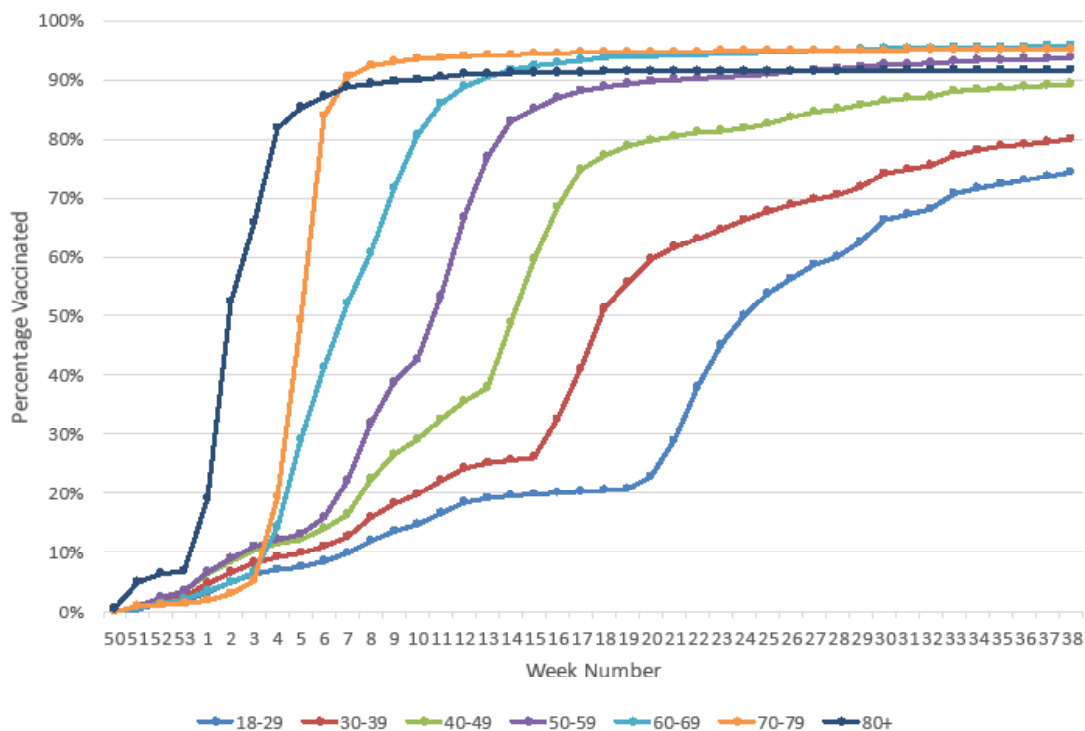
## Vaccination Status

### Methods

- Patients admitted to hospital with COVID-19 are identified using specific Method of Admission Codes. Transfers between hospitals are counted as one admission. Patients are allocated to an age cohort based on their age at date of admission. Patient records are continually updated by HSC Trusts and thus historical data is subject to revision.
- The number of deaths is as reported to the Public Health Agency where the deceased has had a positive test for COVID-19 and dies within 28 days, whether or not COVID-19 was the cause of death. Patients are allocated to an age cohort based on their age at date of death.
- Further details on the definition of admissions and deaths is provided on the Department of Health COVID-19 [dashboard](#).
- The vaccination status of each patient is determined by matching the admission and deaths cases with the vaccination status of the Patient as recorded on the Northern Ireland Vaccine Management System (VMS). If it is not possible to match an admission or death against the vaccination status of the patient on the VMS then the individual is recorded as 'Missing'.
- A person is deemed vaccinated, with a first or second dose, if the date of vaccination is greater than or equal to 14 days before date of admission, or for deaths, if the date of vaccination is greater than or equal to 14 days before date of specimen.
- The number of vaccinated individuals in the population is taken from the VMS with age cohorts calculated at date of vaccination.
- The calculation of the number of unvaccinated individuals in the population requires an estimate of the total population in each age cohort. This was provided by NISRA based on their 2021 [mid year population projections](#).

## Vaccine Coverage

**Figure 1: First dose cumulative vaccine uptake by week number and age group (December 2020 to 26<sup>th</sup> September 2021)**

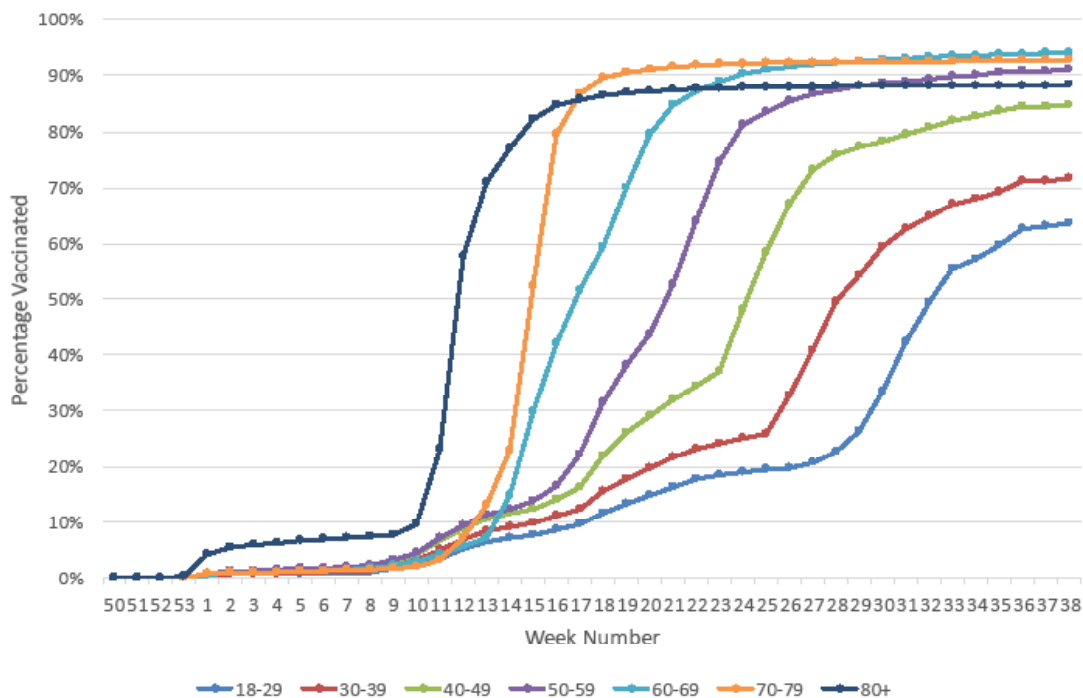


The percentage vaccinated is calculated using the 2021 mid-year population projections



## Vaccine Coverage

**Figure 2: Second dose cumulative vaccine uptake by week number and age group (December 2020 to 26<sup>th</sup> September 2021)**



The percentage vaccinated is calculated using the 2021 mid-year population projections

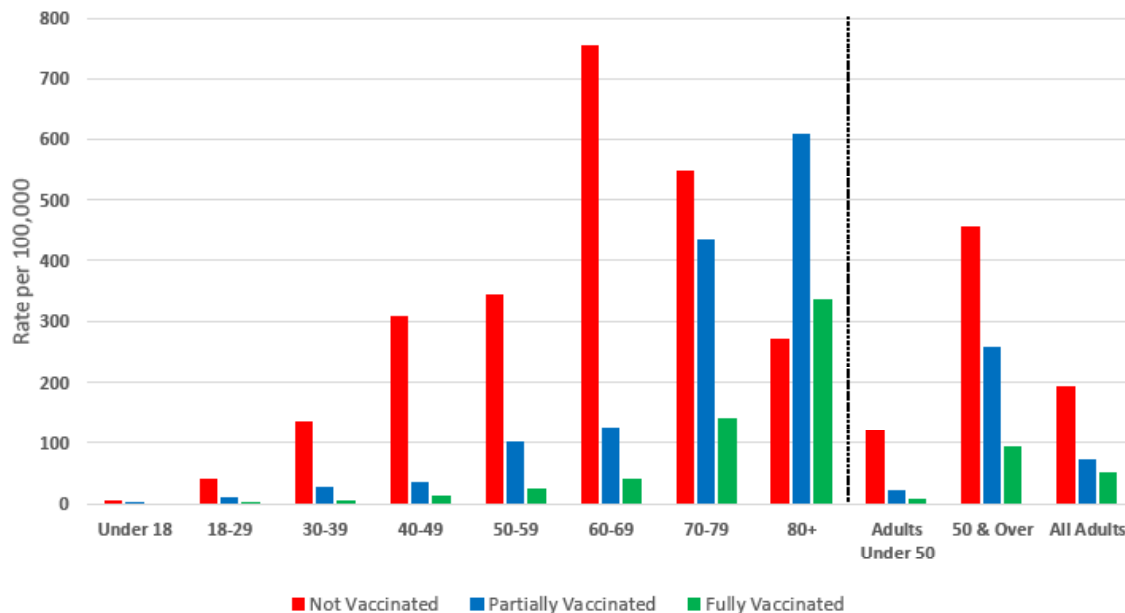
## Vaccination Status – Hospital Admissions

**Table 1: COVID-19 cases admitted to hospital between 30<sup>th</sup> August and 26<sup>th</sup> September 2021**

Age Cohort	Not Vaccinated	Missing	Partially Vaccinated	Fully Vaccinated	Total Admissions	Rates Admitted to Hospital per 100,000		
						Not Vaccinated	Partially Vaccinated	Fully Vaccinated
Under 18	22	0	1	0	23	5.3	3.8	0.0
18-29	30	1	3	7	41	42.7	9.9	4.0
30-39	67	3	6	8	84	133.9	27.9	4.4
40-49	79	1	4	23	107	306.9	35.4	11.3
50-59	56	0	7	63	126	342.8	98.6	26.7
60-69	64	0	5	79	148	753.1	124.9	41.0
70-79	39	2	16	196	253	546.2	435.6	140.7
80+	19	0	18	251	288	271.0	609.8	336.5
Adults Under 50	176	5	13	38	232	120.5	20.6	6.8
50 & Over	178	2	46	589	815	456.6	259.5	91.7
All Adults	354	7	59	627	1047	191.4	73.0	52.2

## Vaccination Status – Hospital Admissions per 100,000

Figure 3: COVID-19 cases admitted to hospital between 30<sup>th</sup> August and 26<sup>th</sup> September 2021



## Vaccination Status – Deaths

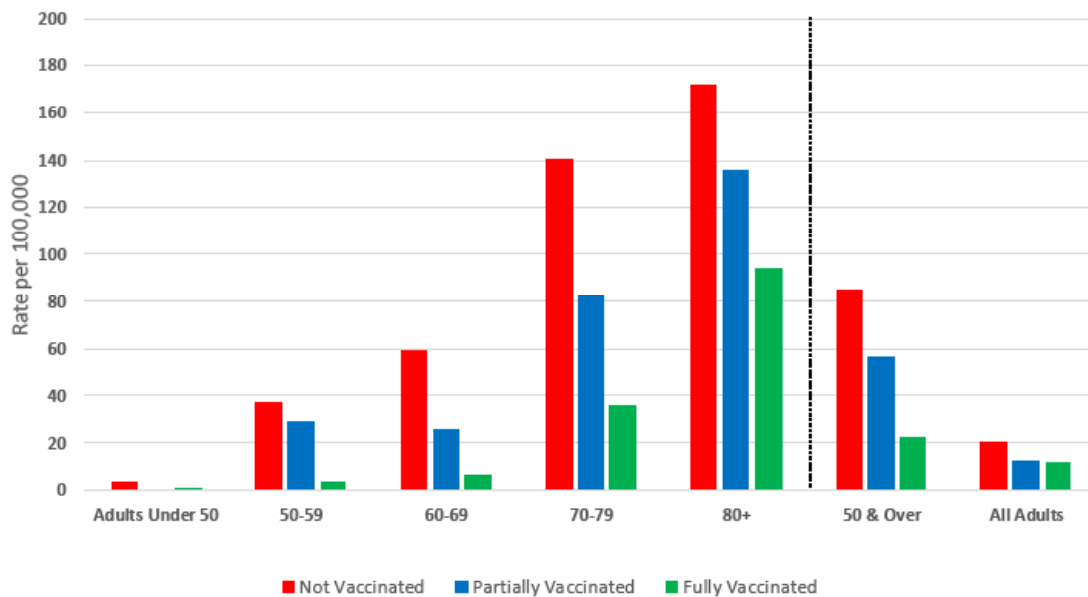
Table 2: COVID-19 deaths within 28 days of a positive test between 30<sup>th</sup> August and 26<sup>th</sup> September 2021

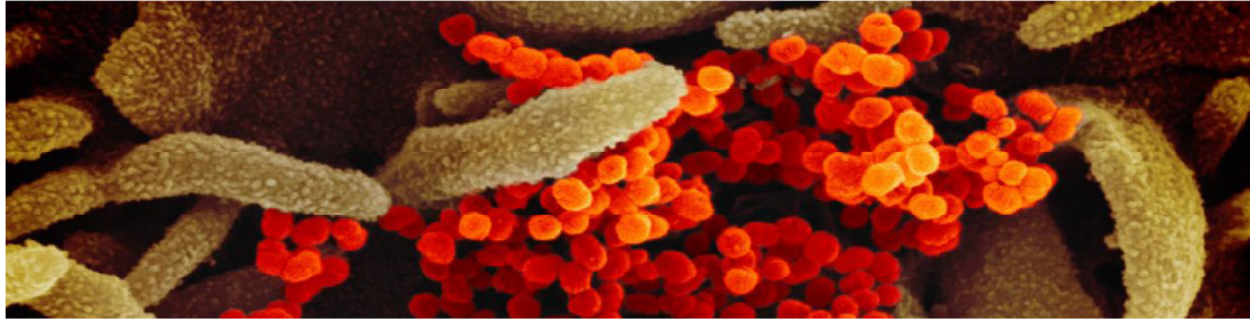
Age Cohort	Not Vaccinated	Missing	Partially Vaccinated	Fully Vaccinated	Total Deaths	Death Rates per 100,000		
						Not Vaccinated	Partially Vaccinated	Fully Vaccinated
Adults Under 50*	4	0	0	1	5	2.7	0.0	0.2
50-59	6	1	2	7	16	36.7	28.2	3.0
60-69	5	0	1	13	19	58.8	25.0	6.7
70-79	10	0	3	50	63	140.1	81.7	35.9
80+	12	1	4	70	87	171.2	135.5	93.9
50 & Over	33	2	10	140	185	84.6	56.4	21.8
All Adults	37	2	10	141	190	20.0	12.4	11.7

\* Age cohorts below 50 are not provided to avoid potential disclosure of individual details.

## Vaccination Status – Deaths per 100,000

Figure 4: COVID-19 deaths within 28 days of a positive test between 30<sup>th</sup> August and 26<sup>th</sup> September 2021





<https://www.health-ni.gov.uk/sites/default/files/publications/health/doh-vaccination-status-weeks-39-42.pdf>

## COVID-19 in Northern Ireland

### Vaccination Status of Deaths and Hospitalisations

Weeks 39 to 42 (27<sup>th</sup> September to 24<sup>th</sup> October 2021)



#### Summary

- The COVID-19 vaccination program for Northern Ireland began in December 2020. By October 2021 approximately 2.5 million first and second doses of the vaccine have been administered, with 88% of adults receiving their first dose and 84% receiving their second dose.
- Ongoing monitoring of vaccine performance is necessary to support Public Health policy as the vaccination program progresses.
- This report presents results for Northern Ireland on the vaccination status of patients who have been hospitalised from COVID-19 and of those who have died from COVID-19 for weeks 39 to 42 (27<sup>th</sup> September to 24<sup>th</sup> October 2021).

#### Hospital Admissions

- Three-quarters of adult COVID-19 inpatients aged under 50 are unvaccinated. 21% of COVID-19 inpatients aged 50 and over are unvaccinated.
- Unvaccinated individuals aged 50 and over are more than **5 times** as likely to be admitted to hospital with COVID-19 than fully vaccinated individuals.
- For adults under 50, whilst the numbers admitted to hospital are lower, an unvaccinated individual is over **15 times** as likely to need hospitalisation from COVID-19.

#### Deaths

- Unvaccinated individuals aged 50 and over are more than **5 times** as likely to die.
- These results should be interpreted in the context of vaccine coverage in the Northern Ireland population (**Figures 1 and 2**). The success of the vaccination programme has resulted in a very small percentage of unvaccinated individuals, particularly for the older age cohorts. When there is a very high vaccine coverage in the population, even with a highly effective vaccine, it is expected that a large proportion of cases, hospitalisations and deaths would occur in vaccinated individuals. This is simply because a larger proportion of the population are vaccinated than unvaccinated and no vaccine is 100% effective. This is especially true because vaccination has been prioritised in individuals who are more susceptible or more at risk of severe disease. Individuals in risk groups may also be more at risk of hospitalisation or death due to non-COVID-19 causes, and thus may be hospitalised or die with COVID-19 rather than because of COVID-19. Death and admissions rates per 100,000 should therefore be interpreted with caution.

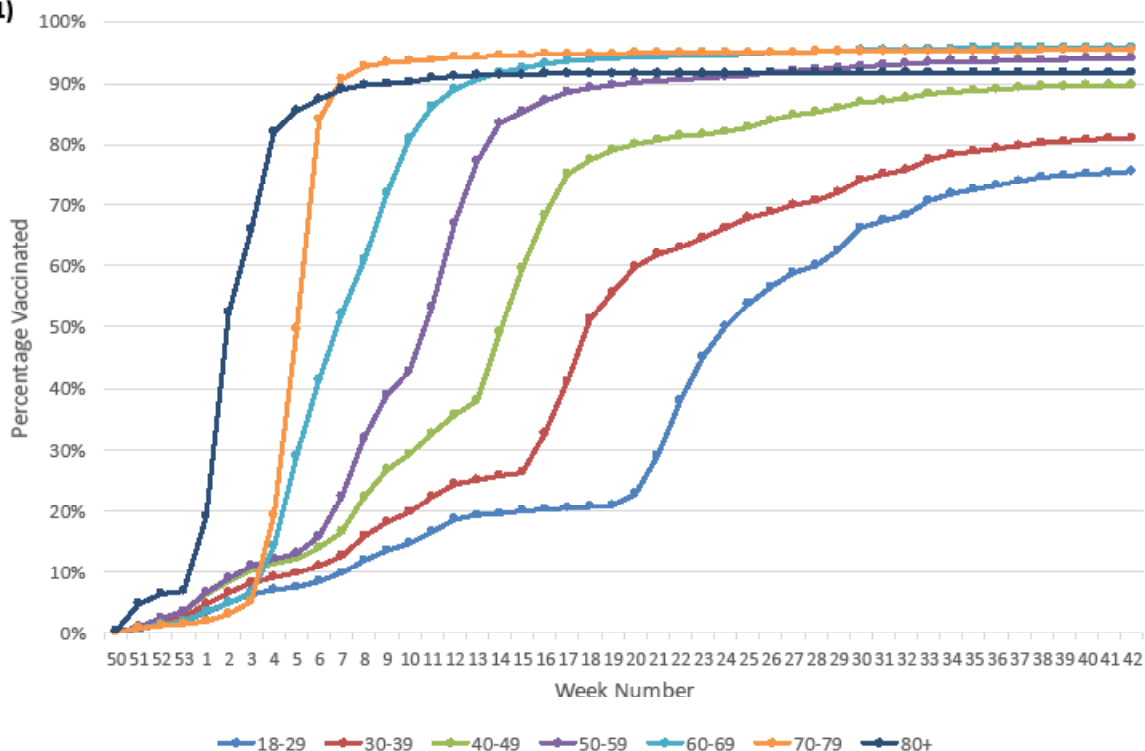
## Vaccination Status

### Methods

- Patients admitted to hospital with COVID-19 are identified using specific Method of Admission Codes. Transfers between hospitals are counted as one admission. Patients are allocated to an age cohort based on their age at date of admission. Patient records are continually updated by HSC Trusts and thus historical data is subject to revision. Further technical guidance on COVID-19 admissions is [appended](#).
- The number of deaths is as reported to the Public Health Agency where the deceased has had a positive test for COVID-19 and dies within 28 days, whether or not COVID-19 was the cause of death. Patients are allocated to an age cohort based on their age at date of death.
- Further details on the definition of admissions and deaths is provided on the Department of Health COVID-19 [dashboard](#).
- The vaccination status of each patient is determined by matching the admission and deaths cases with the vaccination status of the Patient as recorded on the Northern Ireland Vaccine Management System (VMS). If it is not possible to match an admission or death against the vaccination status of the patient on the VMS then the individual is recorded as 'Missing'.
- A person is deemed vaccinated, with a first or second dose, if the date of vaccination is greater than or equal to 14 days before date of admission, or for deaths, if the date of vaccination is greater than or equal to 14 days before date of specimen. In the charts and tables below, 'Partially Vaccinated' refers to those individuals who have received one dose, 'Fully Vaccinated' refers to those individuals who have received two doses.
- The number of vaccinated individuals in the population is taken from the VMS with age cohorts calculated at date of vaccination.
- The calculation of the number of unvaccinated individuals in the population requires an estimate of the total population in each age cohort. This was provided by NISRA based on their 2021 [mid year population projections](#).

## Vaccine Coverage

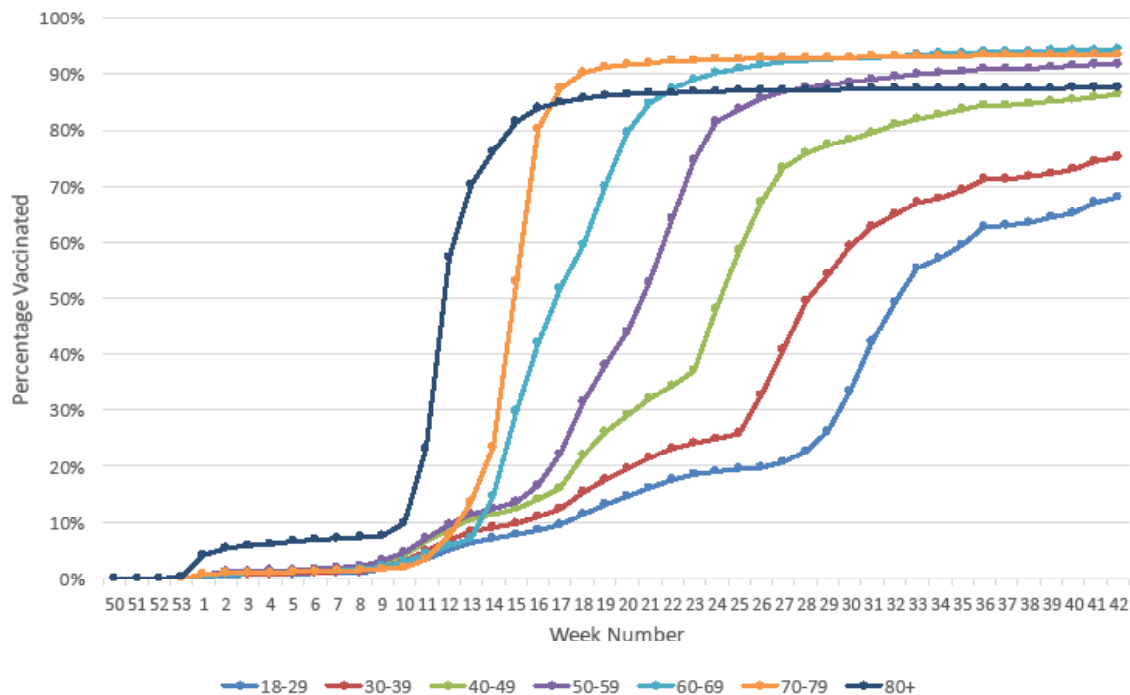
**Figure 1: First dose cumulative vaccine uptake by week number and age group (December 2020 to 24<sup>th</sup> October 2021)**



The percentage vaccinated is calculated using the 2021 mid-year population projections

## Vaccine Coverage

**Figure 2: Second dose cumulative vaccine uptake by week number and age group (December 2020 to 24<sup>th</sup> October 2021)**



The percentage vaccinated is calculated using the 2021 mid-year population projections

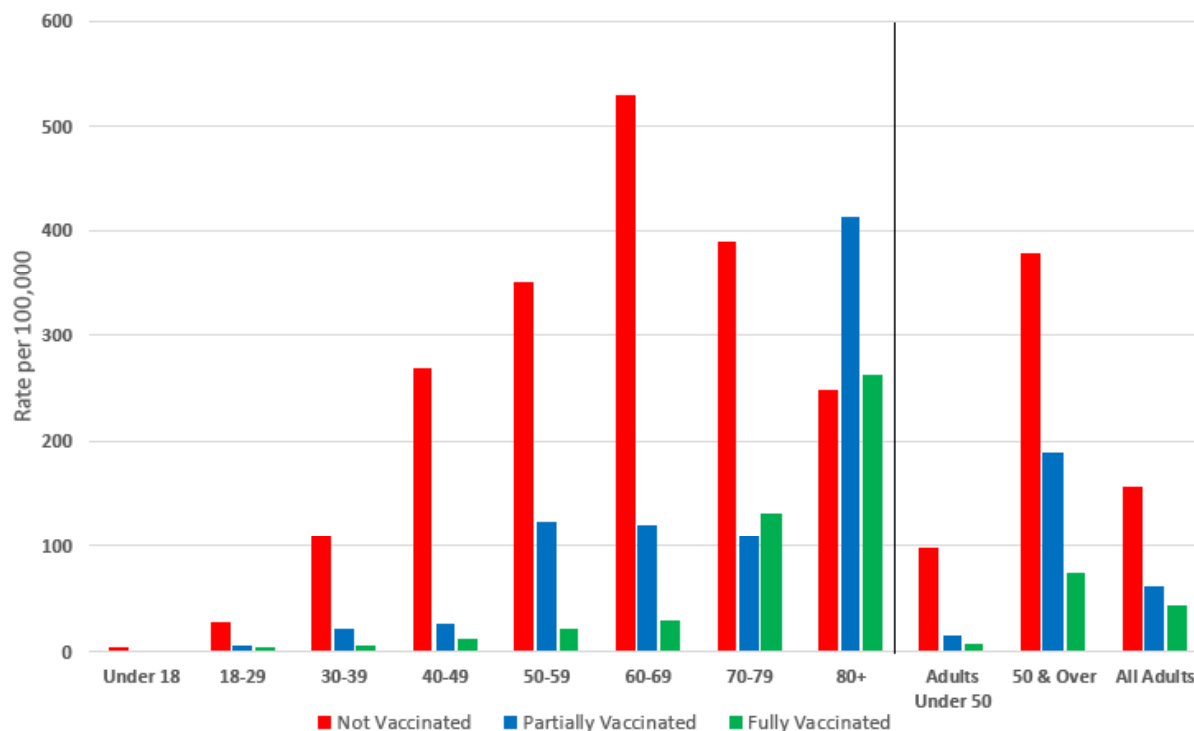
## Vaccination Status – Hospital Admissions

**Table 1: COVID-19 cases admitted to hospital between 27<sup>th</sup> September and 24<sup>th</sup> October 2021**

Age Cohort	Not Vaccinated	Missing	Partially Vaccinated	Fully Vaccinated	Total Admissions	Rates Admitted to Hospital per 100,000		
						Not Vaccinated	Partially Vaccinated	Fully Vaccinated
Under 18	15	0	0	0	15	3.7	0.0	0.0
18-29	18	0	1	4	23	26.7	4.9	2.1
30-39	52	0	3	10	65	108.2	20.6	5.3
40-49	66	2	2	23	93	267.7	24.3	11.1
50-59	54	1	7	50	112	349.9	123.3	21.0
60-69	43	2	4	56	105	528.8	118.8	28.9
70-79	27	1	3	182	213	390.6	109.6	129.6
80+	17	0	15	194	226	247.4	413.7	262.0
Adults Under 50	136	2	6	37	181	97.0	14.0	6.3
50 & Over	141	4	29	482	656	377.5	188.2	74.6
All Adults	277	6	35	519	837	156.1	60.0	42.2

## Vaccination Status – Hospital Admissions per 100,000

Figure 3: COVID-19 cases admitted to hospital between 27<sup>th</sup> September and 24<sup>th</sup> October 2021



## Vaccination Status – Deaths

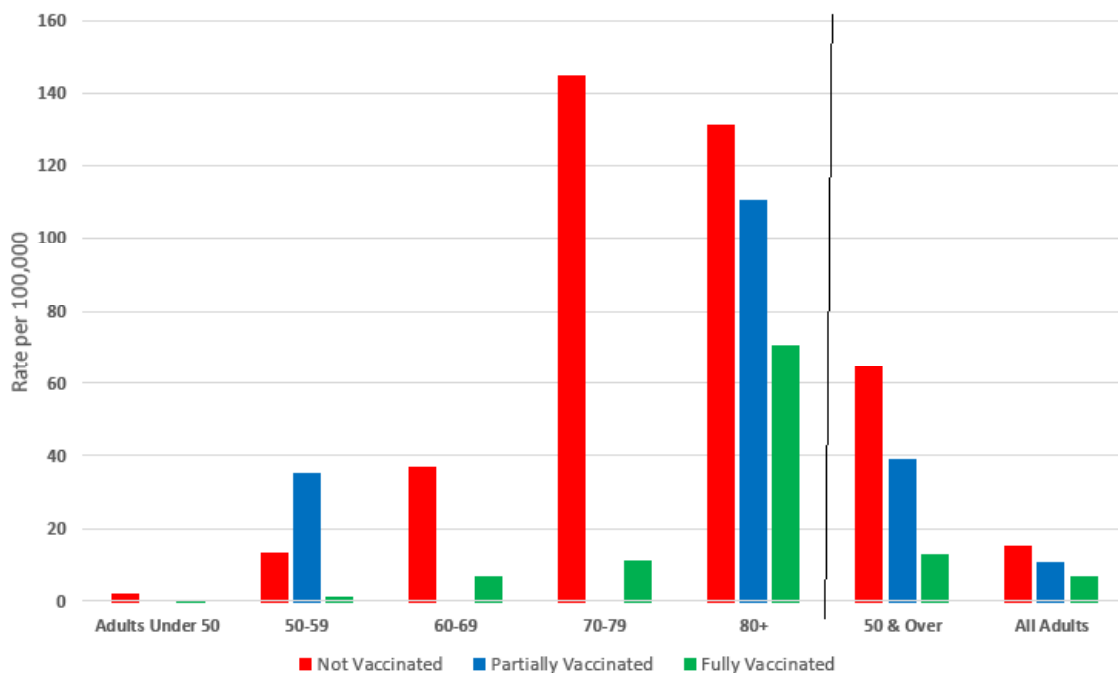
Table 2: COVID-19 deaths within 28 days of a positive test between 27<sup>th</sup> September and 24<sup>th</sup> October 2021

Age Cohort	Not Vaccinated	Missing	Partially Vaccinated	Fully Vaccinated	Total Deaths	Death Rates per 100,000		
						Not Vaccinated	Partially Vaccinated	Fully Vaccinated
Adults Under 50	3	0	0	1	4	2.1	0.0	0.2
50-59	2	0	2	2	6	13.0	35.2	0.8
60-69	3	0	0	13	16	36.9	0.0	6.7
70-79	10	1	0	15	26	144.7	0.0	10.7
80+	9	1	4	52	66	131.0	110.3	70.2
50 & Over	24	2	6	82	114	64.3	38.9	12.7
All Adults	27	2	6	83	118	15.2	10.3	6.7

\* Age cohorts below 50 are not provided to avoid potential disclosure of individual details.

## Vaccination Status – Deaths per 100,000

Figure 4: COVID-19 deaths within 28 days of a positive test between 27<sup>th</sup> September and 24<sup>th</sup> October 2021



## Appendix Technical Guidance on COVID-19 Admissions (1)

- The Patient Administrative System (PAS) is a patient level administrative data source that provides information on patient care delivered by health and social care hospitals in Northern Ireland. Data from PAS are routinely uploaded to the Regional Data Warehouse, which is managed by the Business Service Organisation (BSO).

### Data Quality

- The Department sources data on COVID-19 admissions and inpatients from the Regional Data Warehouse. Up to the 1st December 2020, a daily download was taken at 08:30 from the Admissions & Discharges universe of the Regional Data Warehouse reflecting admissions as of midnight prior to the download date. From 2nd December 2020 two additional daily downloads are taken from; (i) Recent Admissions & Discharges universe which includes data for the two most recent days, and (ii) Admissions & Discharges Specialty universe which is used to identify a number of inpatients in the Belfast HSC Trust. Data from each of these sources are merged and duplicate records are removed from the data.
- Patients admitted with confirmed COVID-19 are identified using the specific Method of Admission Codes (CC, CE or CS) or Specialty Code (COVC). These codes are used for any patient admitted to hospital with confirmed COVID-19. If an inpatient tests positive for COVID-19 the Method of Admission code is revised to one of the confirmed coronavirus codes above. If an inpatient tests positive for COVID-19 and then subsequently tests negative the Method of Admission code remains as one of the confirmed coronavirus codes above.
- Information is constantly being revised as records are updated by HSC Trusts and therefore figures for historical dates may change. When technical issues arise or errors in the data are discovered, the HSCB email to inform DOH.



## Appendix Technical Guidance on COVID-19 Admissions (2)

### Admissions / Discharges

- A patient may be admitted more than once, for example:
  - Admitted on two or more separate occasions
  - Admitted to hospital A within one HSC Trust and later transferred and admitted to hospital B in a different HSC Trust. The admission to hospital B will be recorded as a new admission. Consequently, patients may also be discharged more than once and these discharges will be included in the discharge total.

### Internal Transfers

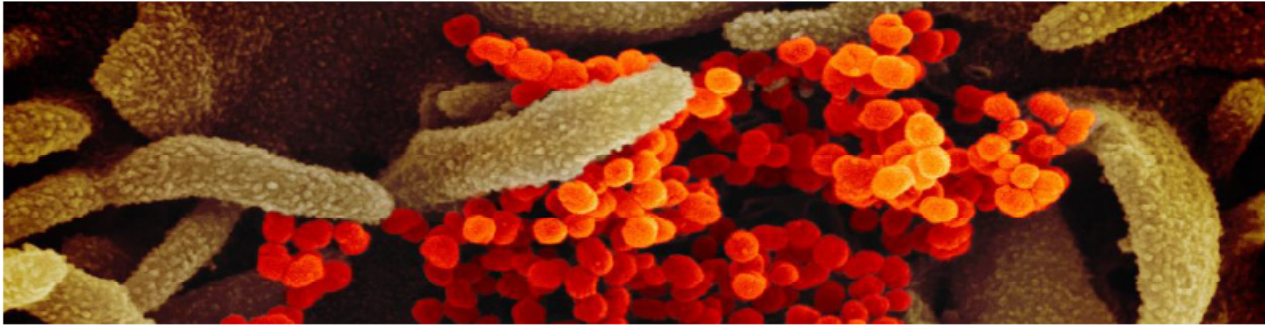
- If a patient confirmed COVID-19 is transferred between hospitals within the same HSC Trust they are admitted using the CC, CE or CS Method of Admission Codes. The Method of Discharge is recorded as ID – Internal Discharge.
- The Belfast Trust identifies confirmed COVID-19 patients by using the specialty code (COVC). Any internal transfers will be admitted using the IA Method of Admission Code.
- Internal transfers are not counted as new admissions and only the first admission record will be counted for these patients.



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<https://www.health-ni.gov.uk/sites/default/files/publications/health/doh-vaccination-status-weeks-43-46.pdf>

# COVID-19 in Northern Ireland

## Vaccination Status of Deaths and Hospitalisations

Weeks 43 to 46 (25<sup>th</sup> October to 21<sup>st</sup> November 2021)

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[www.health-ni.gov.uk](http://www.health-ni.gov.uk)



### Summary

- The COVID-19 vaccination program for Northern Ireland began in December 2020. By mid November 2021 approximately 2.6 million first and second doses of the vaccine have been administered, with 89% of adults receiving their first dose and 85% receiving their second dose.
- Ongoing monitoring of vaccine performance is necessary to support Public Health policy as the vaccination program progresses.
- This report presents results for Northern Ireland on the vaccination status of patients who have been hospitalised from COVID-19 and of those who have died from COVID-19 for weeks 43 to 46 (25<sup>th</sup> October to 21<sup>st</sup> November 2021).

#### Hospital Admissions

- 62% of adult COVID-19 inpatients aged under 50 are unvaccinated. 19% of COVID-19 inpatients aged 50 and over are unvaccinated.
- Unvaccinated individuals aged 50 and over are more than **4 times** as likely to be admitted to hospital with COVID-19 than fully vaccinated individuals.
- For adults under 50, whilst the numbers admitted to hospital are lower, an unvaccinated individual is more than **8 times** as likely to need hospitalisation from COVID-19.

#### Deaths

- Unvaccinated individuals aged 50 and over are almost **4 times** as likely to die than fully vaccinated individuals.
- These results should be interpreted in the context of vaccine coverage in the Northern Ireland population (**Figures 1 and 2**). The success of the vaccination programme has resulted in a very small percentage of unvaccinated individuals, particularly for the older age cohorts. When there is a very high vaccine coverage in the population, even with a highly effective vaccine, it is expected that a large proportion of cases, hospitalisations and deaths would occur in vaccinated individuals. This is simply because a larger proportion of the population are vaccinated than unvaccinated and no vaccine is 100% effective. This is especially true because vaccination has been prioritised in individuals who are more susceptible or more at risk of severe disease. Individuals in risk groups may also be more at risk of hospitalisation or death due to non-COVID-19 causes, and thus may be hospitalised or die with COVID-19 rather than because of COVID-19. Death and admissions rates per 100,000 should therefore be interpreted with caution.

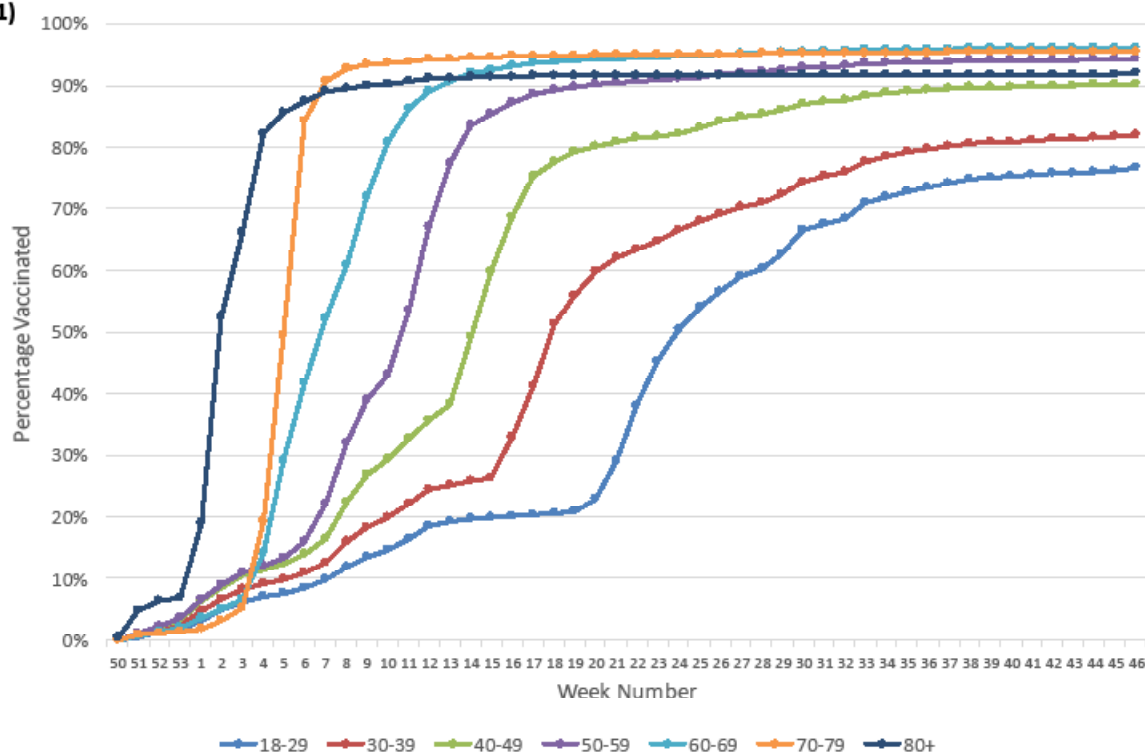
## Vaccination Status

### Methods

- Patients admitted to hospital with COVID-19 are identified using specific Method of Admission Codes. Patients are allocated to an age cohort based on their age at date of admission. Patient records are continually updated by HSC Trusts and thus historical data is subject to revision. Further technical guidance on COVID-19 admissions is [appended](#).
- The number of deaths is as reported to the Public Health Agency where the deceased has had a positive test for COVID-19 and dies within 28 days, whether or not COVID-19 was the cause of death. Patients are allocated to an age cohort based on their age at date of death.
- Further details on the definition of admissions and deaths is provided on the Department of Health COVID-19 [dashboard](#).
- The vaccination status of each patient is determined by matching the admission and deaths cases with the vaccination status of the Patient as recorded on the Northern Ireland Vaccine Management System (VMS). If it is not possible to match an admission or death against the vaccination status of the patient on the VMS then the individual is recorded as 'Missing'.
- A person is deemed vaccinated, with a first or second dose, if the date of vaccination is greater than or equal to 14 days before date of admission, or for deaths, if the date of vaccination is greater than or equal to 14 days before date of specimen. In the charts and tables below, 'Partially Vaccinated' refers to those individuals who have received one dose, 'Fully Vaccinated' refers to those individuals who have received two doses.
- The number of vaccinated individuals in the population is taken from the VMS with age cohorts calculated at date of vaccination.
- The calculation of the number of unvaccinated individuals in the population requires an estimate of the total population in each age cohort. This was provided by NISRA based on their 2021 [mid year population projections](#).

## Vaccine Coverage

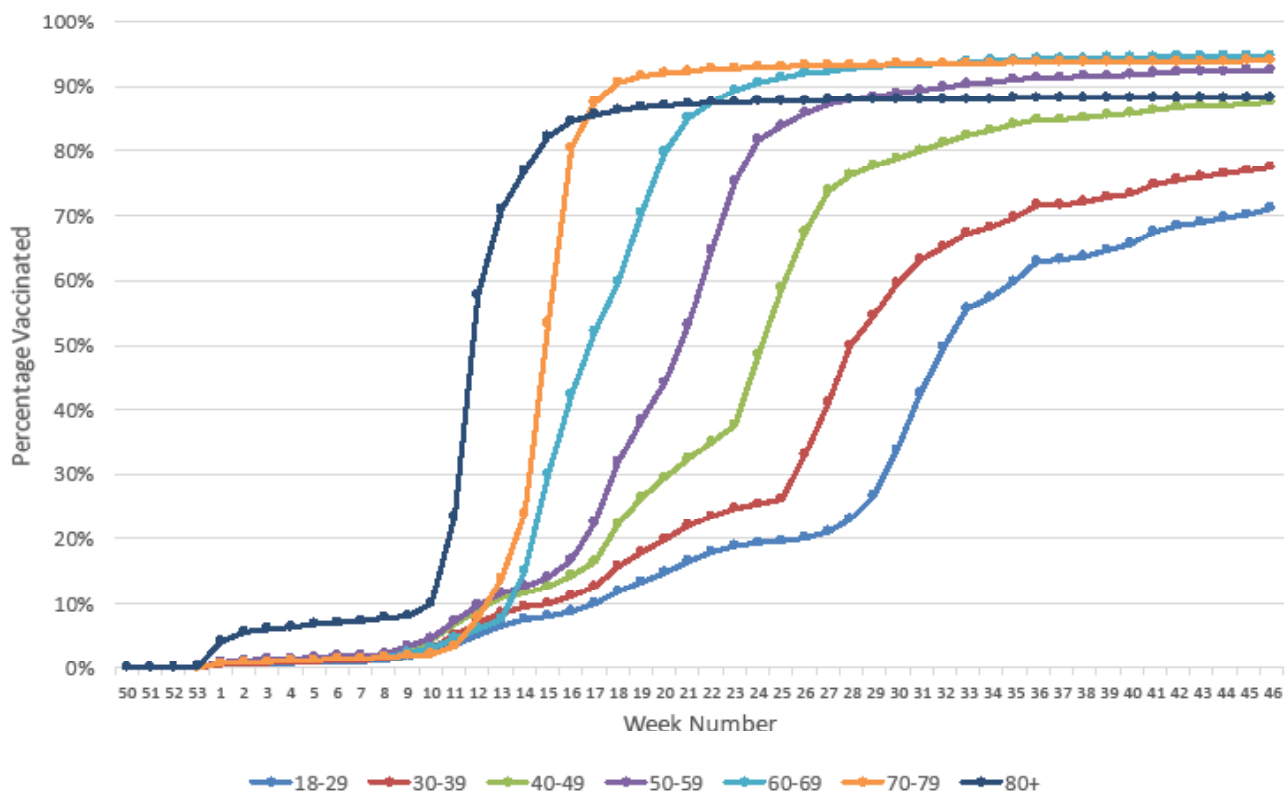
Figure 1: First dose cumulative vaccine uptake by week number and age group (December 2020 to 21<sup>st</sup> November 2021)



The percentage vaccinated is calculated using the 2021 mid-year population projections

## Vaccine Coverage

**Figure 2: Second dose cumulative vaccine uptake by week number and age group (December 2020 to 21<sup>st</sup> November 2021)**



The percentage vaccinated is calculated using the 2021 mid-year population projections

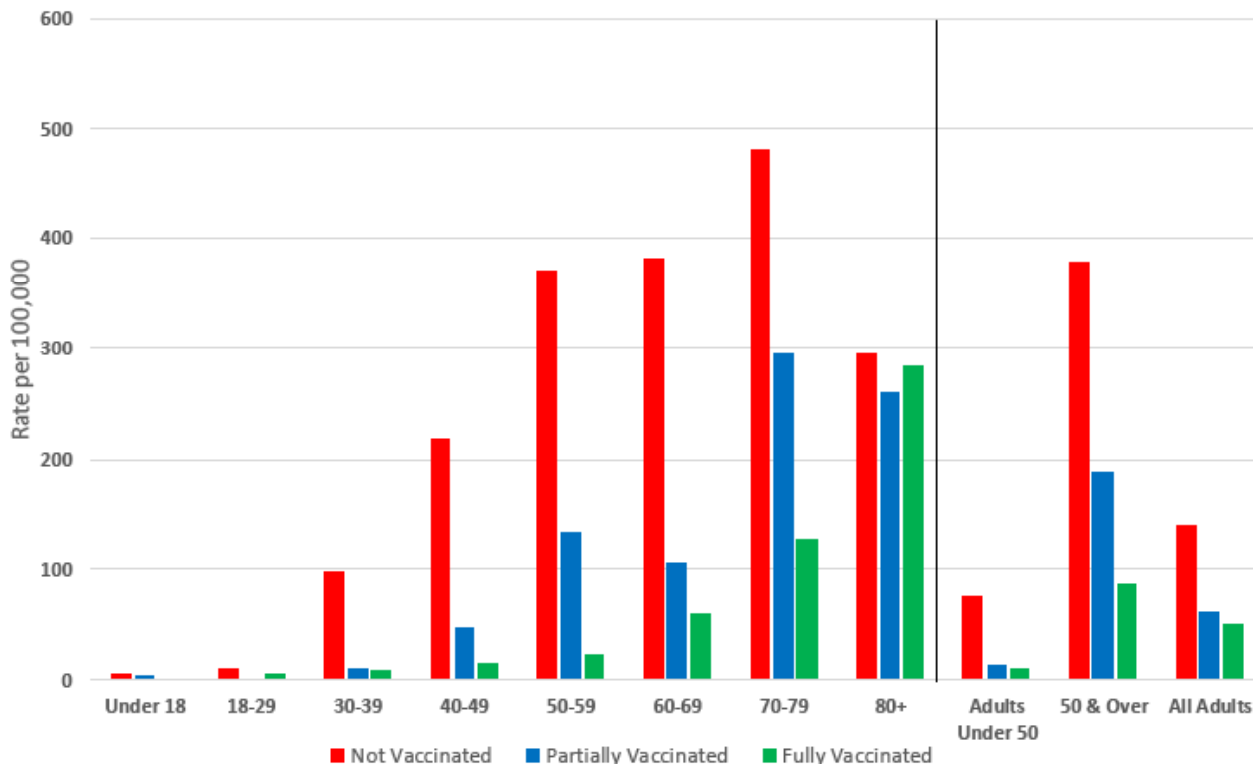
## Vaccination Status – Hospital Admissions

**Table 1: COVID-19 cases admitted to hospital between 25<sup>th</sup> October and 21<sup>st</sup> November 2021**

Age Cohort	Not Vaccinated	Missing	Partially Vaccinated	Fully Vaccinated	Total Admissions	Rates Admitted to Hospital per 100,000		
						Not Vaccinated	Partially Vaccinated	Fully Vaccinated
Under 18	22	0	2	0	24	5.8	3.9	0.0
18-29	6	0	0	10	16	9.3	0.0	5.1
30-39	44	1	1	15	61	96.8	8.9	7.7
40-49	51	2	3	30	86	218.7	46.7	14.2
50-59	54	1	6	53	114	371.0	133.5	22.1
60-69	29	0	3	115	147	381.5	104.8	59.0
70-79	32	2	7	180	221	480.5	294.1	127.6
80+	20	2	8	213	243	295.4	259.3	285.2
Adults Under 50	101	3	4	55	163	75.9	12.2	9.1
50 & Over	135	5	24	561	725	379.4	187.2	86.2
All Adults	236	8	28	616	888	140.0	61.4	49.2

## Vaccination Status – Hospital Admissions per 100,000

Figure 3: COVID-19 cases admitted to hospital between 25<sup>th</sup> October and 21<sup>st</sup> November 2021



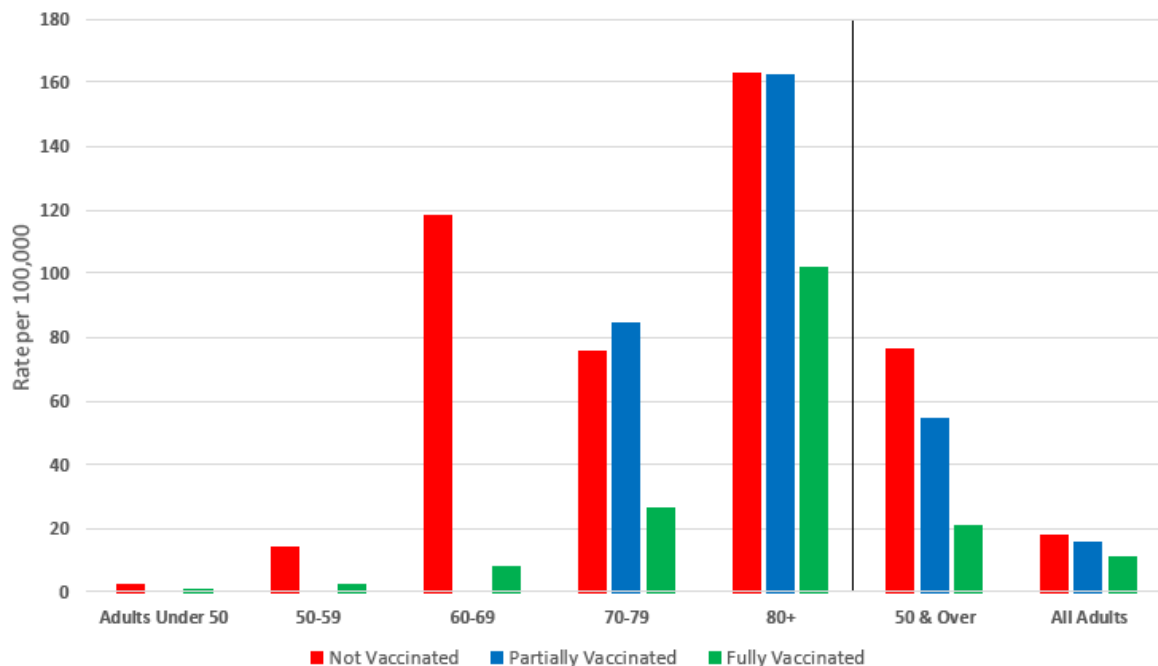
## Vaccination Status – Deaths

Table 2: COVID-19 deaths within 28 days of a positive test between 25<sup>th</sup> October and 21<sup>st</sup> November 2021

Age Cohort	Not Vaccinated	Missing	Partially Vaccinated	Fully Vaccinated	Total Deaths	Death Rates per 100,000		
						Not Vaccinated	Partially Vaccinated	Fully Vaccinated
Adults Under 50	3	0	0	3	6	2.3	0.0	0.5
50-59	2	0	0	5	7	13.7	0.0	2.1
60-69	9	0	0	15	24	118.4	0.0	7.7
70-79	5	1	2	37	45	75.1	84.0	26.2
80+	11	1	5	76	93	162.5	162.1	101.7
50 & Over	27	2	7	133	169	75.9	54.6	20.4
All Adults	30	2	7	136	175	17.8	15.4	10.9

## Vaccination Status – Deaths per 100,000

Figure 4: COVID-19 deaths within 28 days of a positive test between 25<sup>th</sup> October and 21<sup>st</sup> November 2021



## Vaccination Status

Comparison of Rates per 100,000 Over Recent Reporting Periods

Figure 5: COVID-19 cases admitted to hospital between 30<sup>th</sup> August and 21<sup>st</sup> November 2021

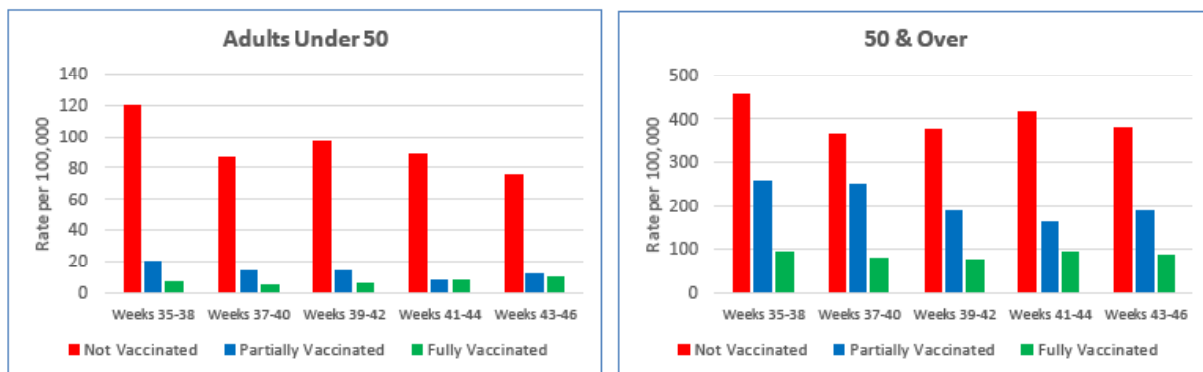
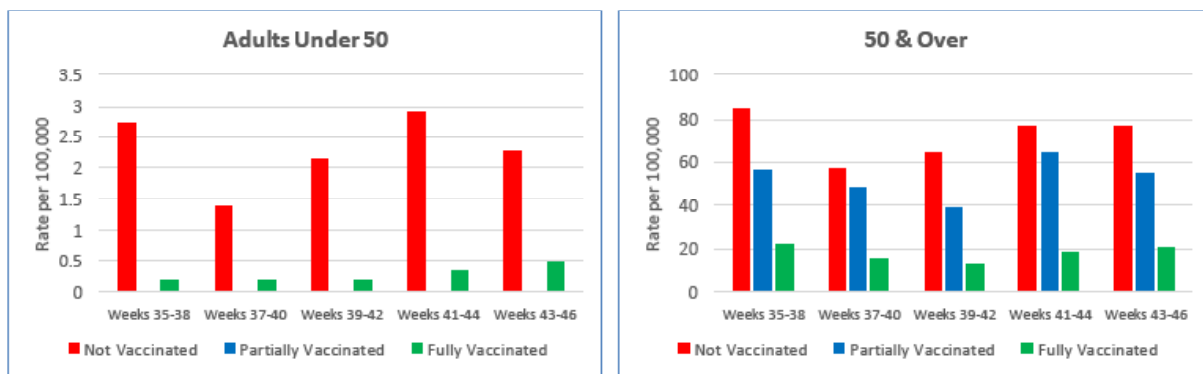


Figure 6: COVID-19 deaths within 28 days of a positive test between 30<sup>th</sup> August and 21<sup>st</sup> November 2021



## Appendix Technical Guidance on COVID-19 Admissions (1)

- The Patient Administrative System (PAS) is a patient level administrative data source that provides information on patient care delivered by health and social care hospitals in Northern Ireland. Data from PAS are routinely uploaded to the Regional Data Warehouse, which is managed by the Business Service Organisation (BSO).

### Data Quality

- The Department sources data on COVID-19 admissions and inpatients from the Regional Data Warehouse. Up to the 1st December 2020, a daily download was taken at 08:30 from the Admissions & Discharges universe of the Regional Data Warehouse reflecting admissions as of midnight prior to the download date. From 2nd December 2020 two additional daily downloads are taken from; (i) Recent Admissions & Discharges universe which includes data for the two most recent days, and (ii) Admissions & Discharges Specialty universe which is used to identify a number of inpatients in the Belfast HSC Trust. Data from each of these sources are merged and duplicate records are removed from the data.
- Patients admitted with confirmed COVID-19 are identified using the specific Method of Admission Codes (CC, CE or CS) or Specialty Code (COVC). These codes are used for any patient admitted to hospital with confirmed COVID-19. If an inpatient tests positive for COVID-19 the Method of Admission code is revised to one of the confirmed coronavirus codes above. If an inpatient tests positive for COVID-19 and then subsequently tests negative the Method of Admission code remains as one of the confirmed coronavirus codes above.
- Information is constantly being revised as records are updated by HSC Trusts and therefore figures for historical dates may change. When technical issues arise or errors in the data are discovered, the HSCB email to inform DOH.

## Appendix Technical Guidance on COVID-19 Admissions (2)

### Admissions / Discharges

- A patient may be admitted more than once, for example:
  - Admitted on two or more separate occasions
  - Admitted to hospital A within one HSC Trust and later transferred and admitted to hospital B in a different HSC Trust. The admission to hospital B will be recorded as a new admission. Consequently, patients may also be discharged more than once and these discharges will be included in the discharge total.

### Internal Transfers

- If a patient confirmed COVID-19 is transferred between hospitals within the same HSC Trust they are admitted using the CC, CE or CS Method of Admission Codes. The Method of Discharge is recorded as ID – Internal Discharge.
- The Belfast Trust identifies confirmed COVID-19 patients by using the specialty code (COVC). Any internal transfers will be admitted using the IA Method of Admission Code.
- Internal transfers are not counted as new admissions and only the first admission record will be counted for these patients.



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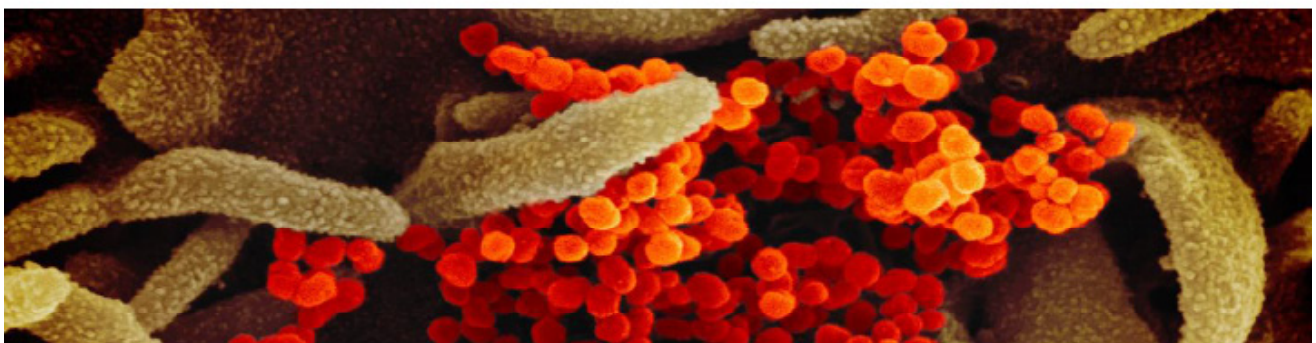
E-mail: [statistics@health-ni.gov.uk](mailto:statistics@health-ni.gov.uk)



Department of  
**Health**

An Roinn Sláinte  
Máinnystrie O Poustle

[www.health-ni.gov.uk](http://www.health-ni.gov.uk)



# COVID-19 in Northern Ireland

## Vaccination Status of Deaths and Hospitalisations

Weeks 47 to 50 (22<sup>nd</sup> November to 19<sup>th</sup> December 2021)

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## Summary

- The COVID-19 vaccination program for Northern Ireland began in December 2020. By December 2021 approximately 2.6 million first and second doses of the vaccine have been administered, with 89% of adults receiving their first dose and 86% receiving their second dose.
- The rollout of the booster vaccinations began in September 2021. By mid December 2021, approximately 0.7 million booster or third doses have been administered. From 19<sup>th</sup> December 2021, anyone aged 18 or over and who received their second dose at least 3 months ago is eligible for a booster dose.
- Ongoing monitoring of vaccine performance is necessary to support Public Health policy as the vaccination program progresses.
- This report presents results for Northern Ireland on the vaccination status of patients who have been hospitalised from COVID-19 and of those who have died from COVID-19 for weeks 47 to 50 (22<sup>nd</sup> November to 19<sup>th</sup> December 2021).
- In this report the vaccination status now includes hospitalised patients who have received their booster or third primary dose. There were 55 patients in the '50 & Over' age group who had received their booster or third dose at least 14 days before their admission date.
- There is currently insufficient data to assess the booster vaccination status of patients who have died from COVID-19. During this 4 week period there were 110 deaths, 5 (4.5%) of which had received a booster or third dose.
- With the recent acceleration of the booster vaccination programme, the number of individuals in the '50 & Over' age group who have received their booster or third dose increased from approximately 350,000 to 500,000 during this 4 week reporting period.
- When calculating the rate per 100,000, small changes in either the number of patients (numerator) or the vaccinated population (denominator) will have a significant effect. In this report the vaccinated population is estimated as the average number of people who had received their booster or third dose in weeks 45 to 48, i.e. 14 days before this reporting period. As the acceleration of the booster programme continues, rates per 100,000 should be interpreted with additional caution.

## Summary

### Hospital Admissions

- Two thirds of adult COVID-19 inpatients aged under 50 are unvaccinated. One third of COVID-19 inpatients aged 50 and over are unvaccinated.
- Unvaccinated individuals aged 50 and over are almost **12 times** as likely to be admitted to hospital with COVID-19 than individuals vaccinated with two doses.
- When compared to fully vaccinated individuals who have also received their booster or third dose, unvaccinated individuals age 50 and over are almost **30 times** as likely to be admitted to hospital with COVID-19.
- Fully vaccinated individuals aged 50 and over, who have still to receive their booster are more than twice as likely to be admitted to hospital with COVID-19 than those who have also received their booster or third dose.
- For adults under 50, whilst the numbers admitted to hospital are lower, an unvaccinated individual is more than **11 times** as likely to need hospitalisation from COVID-19.

### Deaths

- Unvaccinated individuals aged 50 and over are more than **7 times** as likely to die than individuals vaccinated with at least two doses.

### Note

- These results should be interpreted in the context of vaccine coverage in the Northern Ireland population (**Figures 1 to 3**). The success of the vaccination programme has resulted in a very small percentage of unvaccinated individuals, particularly for the older age cohorts. When there is a very high vaccine coverage in the population, even with a highly effective vaccine, it is expected that a large proportion of cases, hospitalisations and deaths would occur in vaccinated individuals. This is simply because a larger proportion of the population are vaccinated than unvaccinated and no vaccine is 100% effective. This is especially true because vaccination has been prioritised in individuals who are more susceptible or more at risk of severe disease. Individuals in risk groups may also be more at risk of hospitalisation or death due to non-COVID-19 causes, and thus may be hospitalised or die with COVID-19 rather than because of COVID-19. Death and admissions rates per 100,000 should therefore be interpreted with caution.

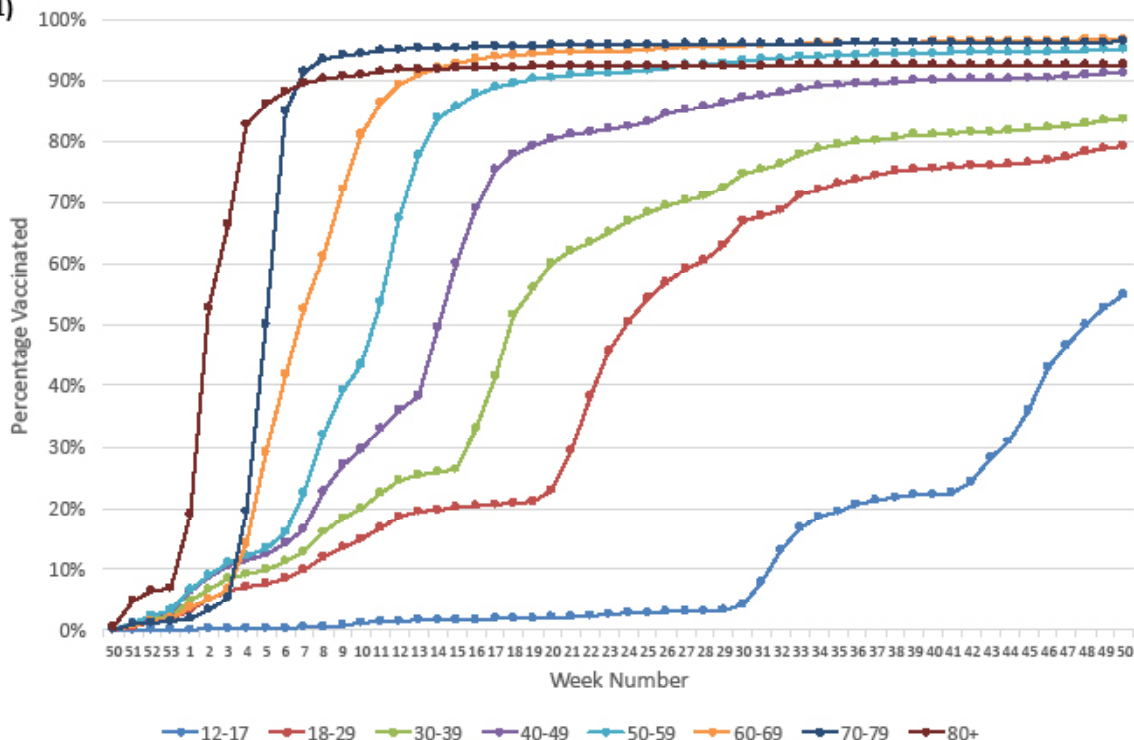
## Vaccination Status

### Methods

- Patients admitted to hospital with COVID-19 are identified using specific Method of Admission Codes. Patients are allocated to an age cohort based on their age at date of admission. Patient records are continually updated by HSC Trusts and thus historical data is subject to revision. Further technical guidance on COVID-19 admissions is [appended](#).
- The number of deaths is as reported to the Public Health Agency where the deceased has had a positive test for COVID-19 and dies within 28 days, whether or not COVID-19 was the cause of death. Patients are allocated to an age cohort based on their age at date of death.
- Further details on the definition of admissions and deaths is provided on the Department of Health COVID-19 [dashboard](#).
- The vaccination status of each patient is determined by matching the admission and deaths cases with the vaccination status of the Patient as recorded on the Northern Ireland Vaccine Management System (VMS). If it is not possible to match an admission or death against the vaccination status of the patient on the VMS then the individual is recorded as 'Missing'.
- A person is deemed vaccinated if the date of vaccination is greater than or equal to 14 days before date of admission, or for deaths, if the date of vaccination is greater than or equal to 14 days before date of specimen. In the charts and tables below, 'Partially Vaccinated' refers to those individuals who have received one dose, 'Fully Vaccinated' refers to those individuals who have received two doses. 'Fully Vaccinated + Booster or Dose 3' refers to those individuals who have received two primary doses plus the booster vaccine or third primary dose.
- The number of vaccinated individuals in the population is taken from the VMS with age cohorts calculated at date of vaccination.
- The calculation of the number of unvaccinated individuals in the population requires an estimate of the total population in each age cohort. This was provided by NISRA based on their 2021 [mid year population projections](#).

## Vaccine Coverage

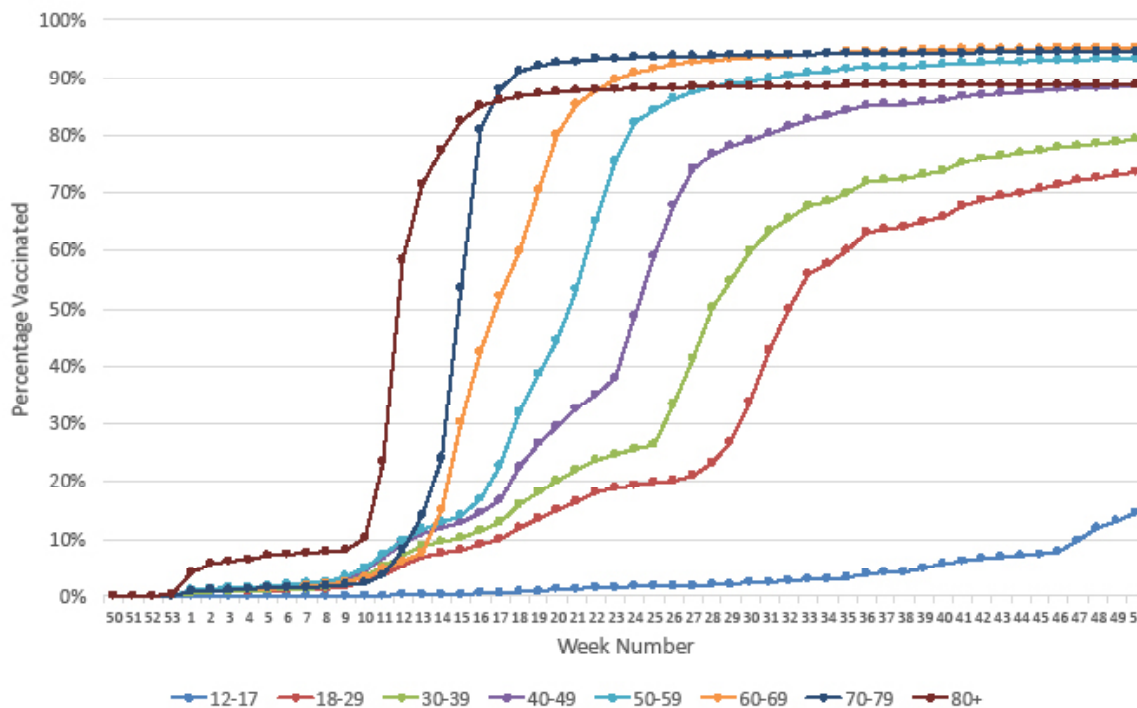
Figure 1: First dose cumulative vaccine uptake by week number and age group (December 2020 to 19<sup>th</sup> December 2021)



The percentage vaccinated is calculated using the 2021 mid-year population projections

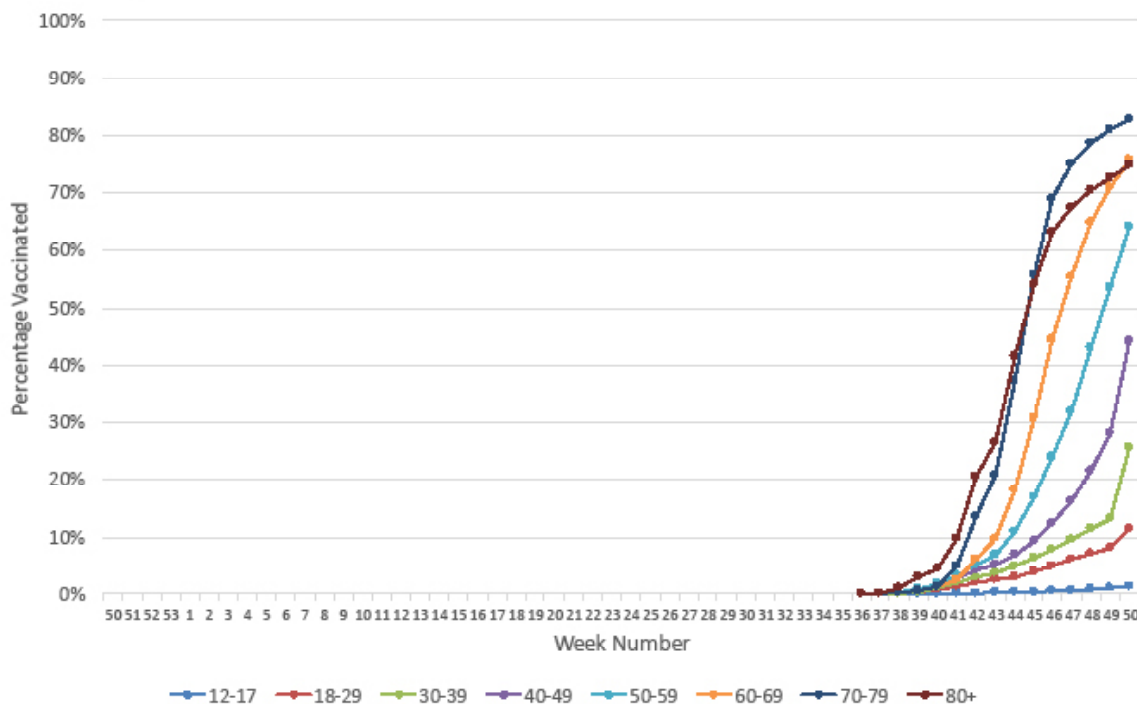
## Vaccine Coverage

Figure 2: Second dose cumulative vaccine uptake by week number and age group (December 2020 to 19<sup>th</sup> December 2021)



## Vaccine Coverage

Figure 3: Booster or third dose cumulative vaccine uptake by week number and age group (December 2020 to 19<sup>th</sup> December 2021)



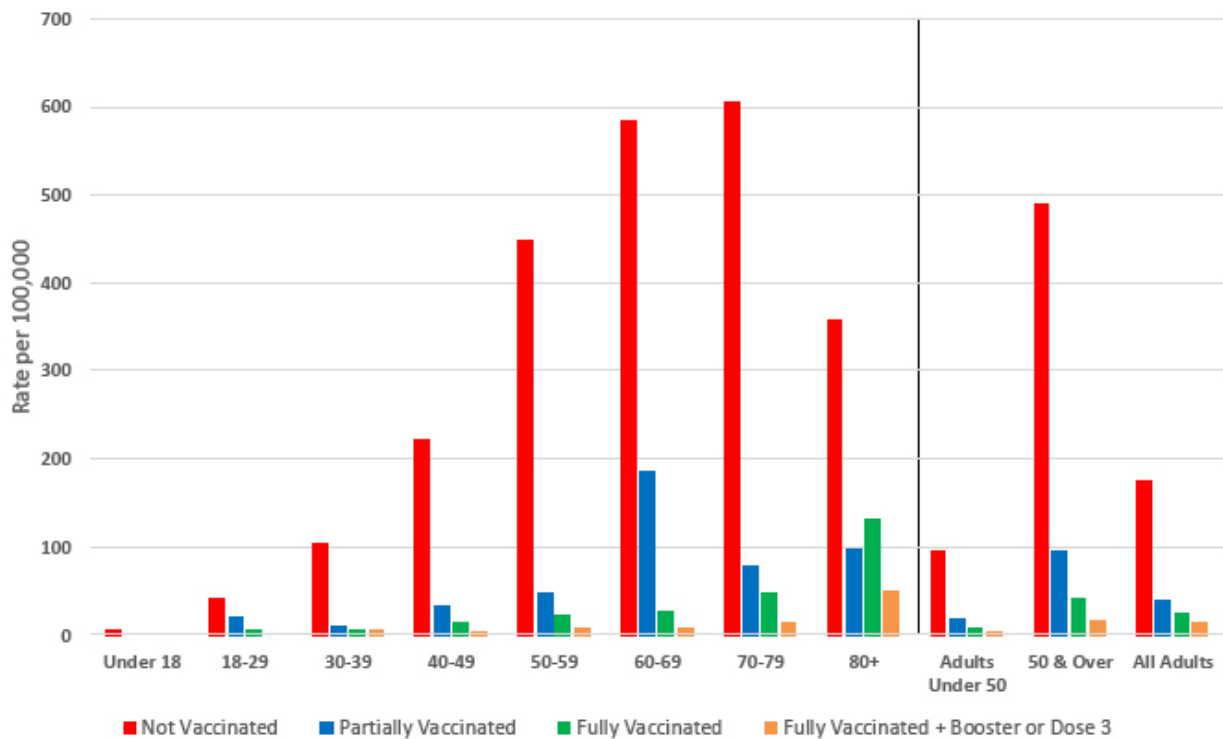
## Vaccination Status – Hospital Admissions

Table 1: COVID-19 cases admitted to hospital between 22<sup>nd</sup> November and 19<sup>th</sup> December 2021

Age Cohort	Not Vaccinated	Missing	Partially Vaccinated	Fully Vaccinated (2 doses)	Fully Vaccinated + Booster or Dose 3	Total Admissions	Rates Admitted to Hospital per 100,000			
							Not Vaccinated	Partially Vaccinated	Fully Vaccinated (2 doses)	Fully Vaccinated + Booster or Dose 3
Under 18	15	0	0	0	0	15	4.1	0.0	0.0	0.0
18-29	25	1	3	10	0	39	42.2	19.5	5.0	0.0
30-39	44	1	1	12	1	59	103.5	9.1	6.0	4.6
40-49	48	1	2	30	1	82	221.2	32.5	14.1	2.8
50-59	59	0	2	50	6	117	446.7	48.0	20.7	8.0
60-69	41	2	5	53	7	108	583.0	186.3	27.1	7.0
70-79	34	0	2	66	15	117	605.7	77.7	46.5	14.4
80+	23	2	3	99	27	154	358.0	98.6	131.9	50.0
Adults Under 50	117	3	6	52	2	180	94.8	18.4	8.5	2.8
50 & Over	157	4	12	268	55	496	489.7	95.1	40.9	16.5
All Adults	274	7	18	320	57	676	176.4	39.8	25.3	14.0

## Vaccination Status – Hospital Admissions per 100,000

Figure 4: COVID-19 cases admitted to hospital between 22<sup>nd</sup> November and 19<sup>th</sup> December 2021



## Vaccination Status – Deaths

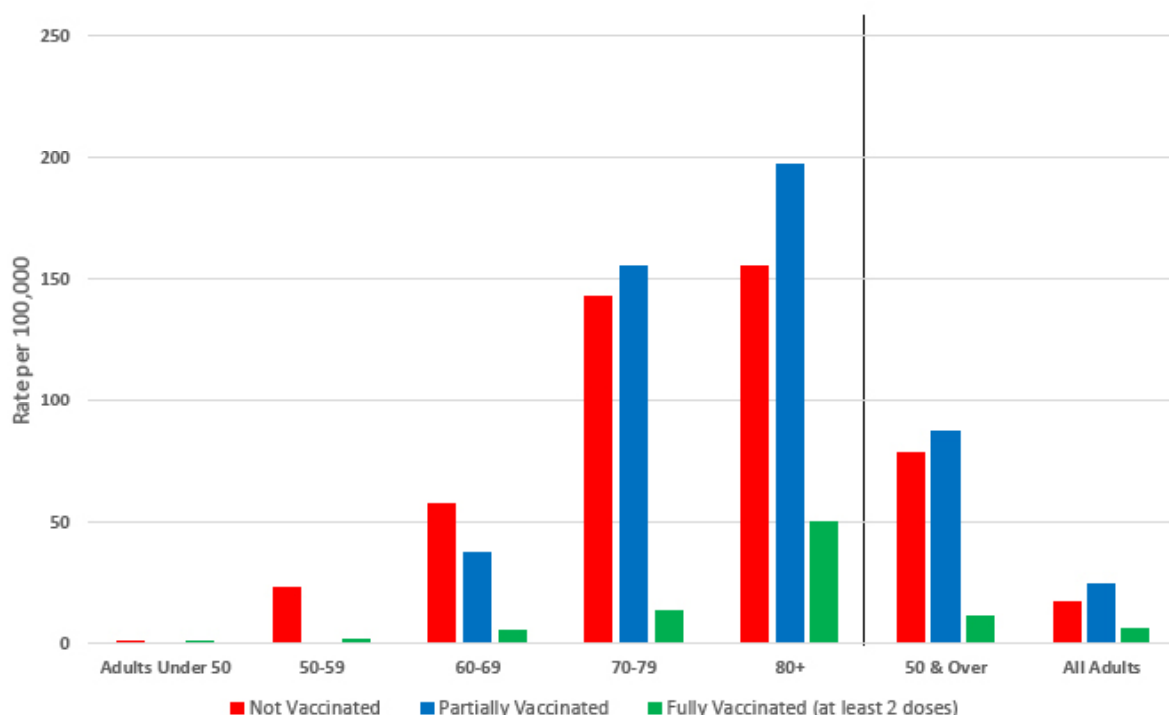
Table 2: COVID-19 deaths within 28 days of a positive test between 22<sup>nd</sup> November and 19<sup>th</sup> December 2021

Age Cohort	Not Vaccinated	Missing	Partially Vaccinated	Fully Vaccinated (at least 2 doses)	Total Deaths	Death Rates per 100,000		
						Not Vaccinated	Partially Vaccinated	Fully Vaccinated (at least 2 doses)
Adults Under 50	1	0	0	3	4	0.8	0.0	0.5
50-59	3	0	0	4	7	22.7	0.0	1.7
60-69	4	0	1	10	15	56.9	37.3	5.1
70-79	8	0	4	19	31	142.5	155.5	13.4
80+	10	0	6	37	53	155.7	197.2	49.3
50 & Over	25	0	11	70	106	78.0	87.2	10.7
All Adults	26	0	11	73	110	16.7	24.3	5.8

\* Age cohorts below 50 are not provided to avoid potential disclosure of individual details.

## Vaccination Status – Deaths per 100,000

Figure 5: COVID-19 deaths within 28 days of a positive test between 22<sup>nd</sup> November and 19<sup>th</sup> December 2021



## Vaccination Status

### Comparison of Rates per 100,000 Over Recent Reporting Periods

Figure 6: COVID-19 cases admitted to hospital between 30<sup>th</sup> August and 19<sup>th</sup> December 2021

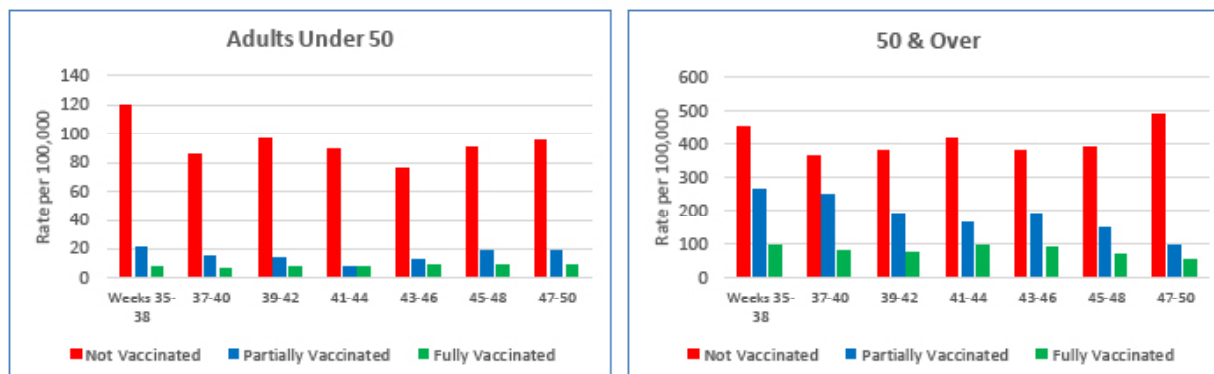
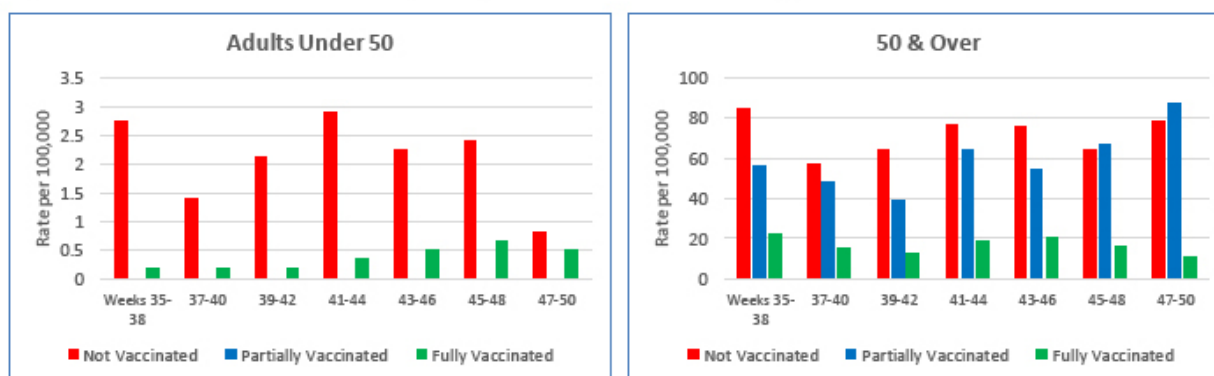


Figure 7: COVID-19 deaths within 28 days of a positive test between 30<sup>th</sup> August and 19<sup>th</sup> December 2021



## Appendix

### Technical Guidance on COVID-19 Admissions (1)

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## Appendix Technical Guidance on COVID-19 Admissions (2)

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