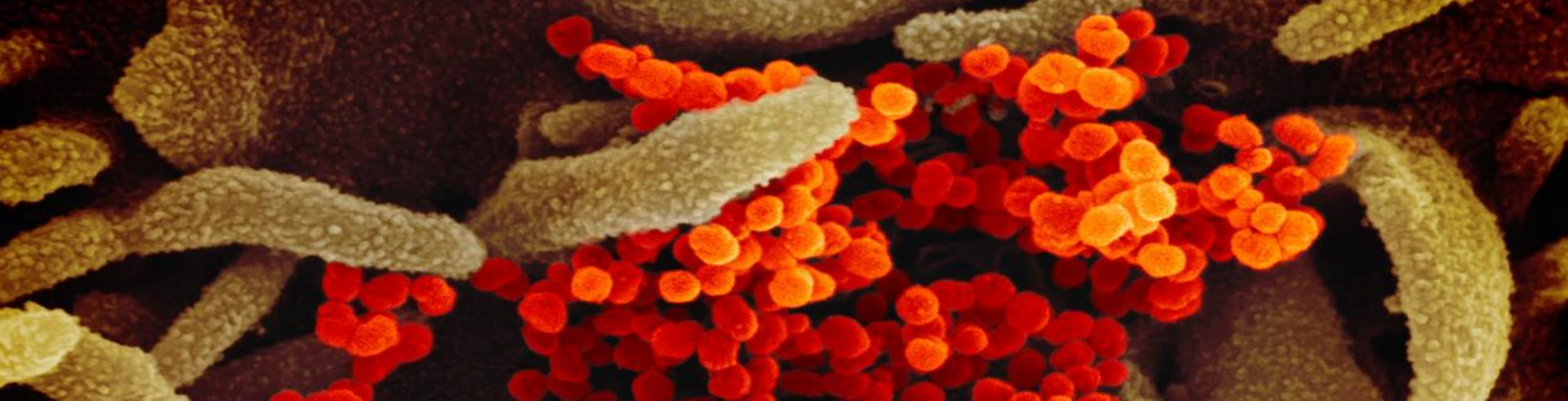

COVID-19 Infection Survey

Antibody and vaccination data for Northern Ireland

4th August 2021

INFORMATION ANALYSIS DIRECTORATE

Department of Health
An Roinn Sláinte
Männystrie O Poustie
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Likelihood of testing positive for COVID-19 antibodies in Northern Ireland

About this analysis

This analysis is based on blood test results taken from a randomly selected subsample of individuals aged 16 years and over from the Coronavirus (COVID-19) Infection Survey, which are used to test for antibodies against SARS-CoV-2. This can be used to identify individuals who have had the infection in the past or have developed antibodies as a result of vaccination. These statistics refer to the presence of antibodies to the Coronavirus (COVID-19) within the community population, by which we mean private residential households. These figures exclude those in hospitals, care homes and/or other institutional settings.

The presence of antibodies is measured to understand who has had coronavirus (COVID-19) in the past and the impact of vaccinations. It takes between two and three weeks after infection or vaccination for the body to make enough antibodies to fight the infection. Having antibodies can help to prevent individuals from getting the same infection again, or if they do get infected, they are less likely to have severe symptoms. Once infected or vaccinated, antibodies remain in the blood at low levels and can decline over time. The length of time antibodies remain at detectable levels in the blood is not fully known. It is also not yet known how having detectable antibodies, now or at some time in the past, affects the chance of becoming infected or experiencing symptoms, as other parts of the immune system (T cell response) will offer protection.

Antibody positivity is defined by a fixed amount of antibodies in the blood. A negative test result will occur if there are no antibodies or if antibody levels are too low to reach this threshold. It is important to draw the distinction between testing positive for antibodies and having immunity. Following infection or vaccination, antibody levels can vary and sometimes increase but are still below the level identified as "positive" in our test, and other tests. This does not mean that a person has no protection against COVID-19 since a immune response does not rely on the presence of antibodies alone. It is also not yet known exactly how much antibodies need to rise to give protection. A person's 'T cell' response will provide protection but it is not detected by blood tests for antibodies. A person's immune response is affected by a number of factors, including health conditions and age.

Antibody estimates are now reported using modelled estimates, which allows the provision of more timely weekly estimates given the rapid vaccination rollout whilst still adjusting to make the estimates representative of the population. Weekly modelled estimates are produced using standard calendar weeks starting Monday. To provide the most timely and accurate estimates possible for antibody positivity, the model will include data for the first four to seven days of the most recent week available, depending on the availability of test results. Data since 7th December 2020 has been presented.

Further information on the new method to model antibodies can be found in the updated methods article from ONS.

Estimates on the proportion of people who have received at least one dose of a vaccine against COVID-19 as well as those who have been fully vaccinated are now also included. The estimates of the percentage of people vaccinated are based on modelling of the people visited in the COVID-19 Infection Survey in the community in a particular time period. These estimates are then adjusted (post-stratified) using population estimates to be representative. Date presented relates to the percentage of people aged 16 years and over who report they have received one or more doses of a COVID-19 vaccine since 14 December 2020, and the percentage of people aged 16 years and over who are fully vaccinated since 15 February 2021.

However, these estimates may differ from other figures given through administrative data systems. While the daily official government figures provide the recorded actual numbers of vaccines against COVID-19, the vaccination estimates presented here are based on a sample survey of reported vaccine status and are provided for context alongside the antibodies estimates. Importantly, the survey collects information from the population living in private households and does not include people living in communal establishments such as care homes, hospitals or prisons. The value of showing the estimates of vaccines alongside the estimates of people testing positive for antibodies is to illustrate the relationship between the two.

Differences between official figures and the estimates from this survey differ in scale across each of the four nations (some survey estimates are closer to the official reported figures than others) due to differences in reporting dates and the inclusion of National Immunisation Management System (NIMS) data for England. In addition, the sampling method for Northern Ireland is different to the other nations, inviting only people that have previously participated in a Northern Ireland Statistics and Research Agency (NISRA) survey, which could result in a sample of individuals that are more likely to get vaccinated. This should be taken into consideration if comparing vaccine and antibody estimates across the four nations, since vaccine status and antibody positivity are related. Further information on Northern Ireland vaccination figures is available from the NI COVID-19 Vaccinations Dashboard. As analysis develops, the survey-based estimates will enable possible future analysis of people who have received a vaccine with other characteristics collected in the survey.

Modelled estimates of antibody positivity and vaccination estimates are presented for Northern Ireland along with the headline estimates for England, Wales and Scotland.

This antibody and vaccination publication will be produced fortnightly and the information contained in it will be published simultaneously by the Office for National Statistics in a UK antibody report on their own website Coronavirus (COVID-19) Infection Survey antibody data for the UK.

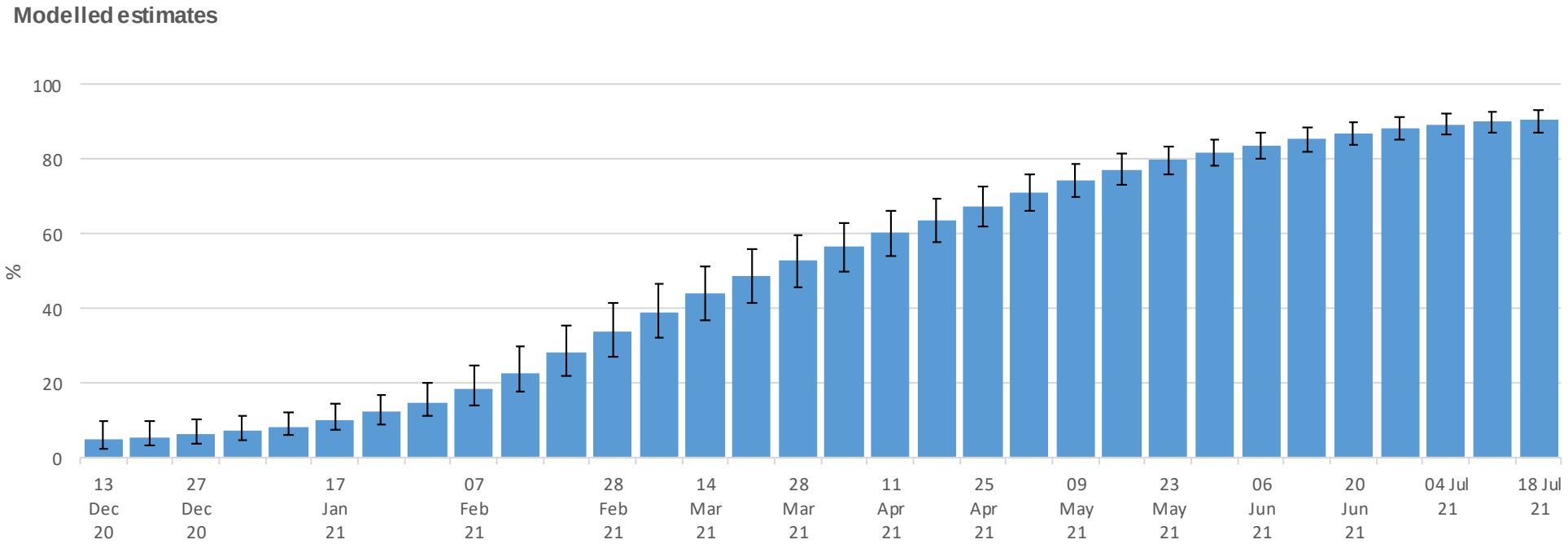
Antibody data for Northern Ireland

In Northern Ireland, it is estimated that around 9 in 10 adults, or 90.7% of the adult population (95% credible interval: 87.4% to 93.3%) would have tested positive for antibodies against SARS-CoV-2 on a blood test in the week beginning 12th July 2021, suggesting they had the infection in the past or have been vaccinated. The data in figure 1 below are presented in Appendix 1.

In the data used to produce these estimates, the number of people sampled in Northern Ireland who tested positive for antibodies to SARS-CoV-2 is low compared with England. This means there is a higher degree of uncertainty in estimates for Northern Ireland, as indicated by larger credible intervals.

Figure 1: Modelled percentage of people testing positive for COVID-19 antibodies from a blood sample in Northern Ireland

07 December 2020 to 18 July 2021



Source: Office for National Statistics - Coronavirus (COVID-19) Infection Survey

Notes:

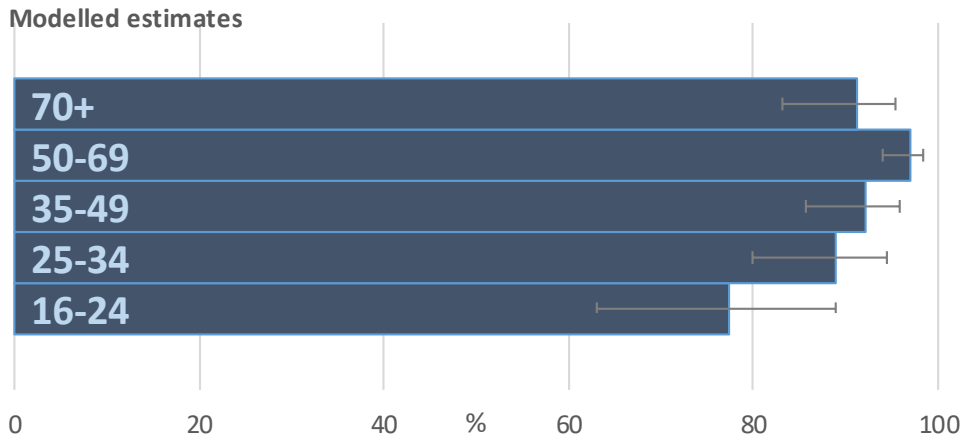
1. All results are provisional and subject to revision.
2. These statistics refer to infections reported in the community, by which we mean private households. These figures exclude infections reported in hospitals, care homes and/or other institutional settings.
3. All estimates are subject to uncertainty, given that a sample is only part of the wider population. A credible interval gives an indication of the uncertainty of an estimate from data analysis. 95% credible intervals are calculated so that there is a 95% probability of the true value lying in the interval.
4. The Northern Ireland population used in this analysis is 1,483,320 and relates to the community population aged 16 years and over. It is not the same as the total population of NI which is reported in the official mid-year population estimates.

Antibody data by age for Northern Ireland

In Northern Ireland, in the week beginning 12 July 2021, the percentage of adults aged 16 to 49 testing positive for antibodies ranged from 77.3% to 92.0%; in those aged 50 to 69 it was 97.0% (95% credible interval: 93.9% to 98.4%); and for those 70 years and over it was 91.2% (95% credible interval: 83.2% to 95.3%). In recent weeks in Northern Ireland, the percentage of adults testing positive for antibodies increased or remained high for all age-groups. Antibody positivity is lowest in the younger age groups. Modelled daily estimates by age over time are set out in Appendix 2.

Credible intervals are wide and the sample sizes relatively small, meaning there is greater uncertainty in these figures.

Figure 2: Modelled percentage of people testing positive for COVID-19 antibodies by age in Northern Ireland
12 July 2021 to 18 July 2021



Age band	% testing positive for COVID-19 antibodies	95% credible interval		Number of people in sample
		Lower	Upper	
Age 16 - Age 24	77.3%	63.0%	88.9%	32
Age 25 - Age 34	88.8%	79.8%	94.4%	85
Age 35 - Age 49	92.0%	85.7%	95.9%	172
Age 50 - Age 69	97.0%	93.9%	98.4%	352
Age 70+	91.2%	83.2%	95.3%	147

In some regions and countries within the UK, the study is starting to see a decline in the percentage of people testing positive for antibodies amongst the oldest age groups, although rates amongst these age groups remain high. The analysis defines antibody positivity by a fixed amount of antibodies in the blood. Most older people who are vaccinated will retain higher antibody levels than prior to vaccination, but may have a lower number of antibodies in the blood at the time of testing. Please read the ONS Antibodies and Immunity blog for more information.

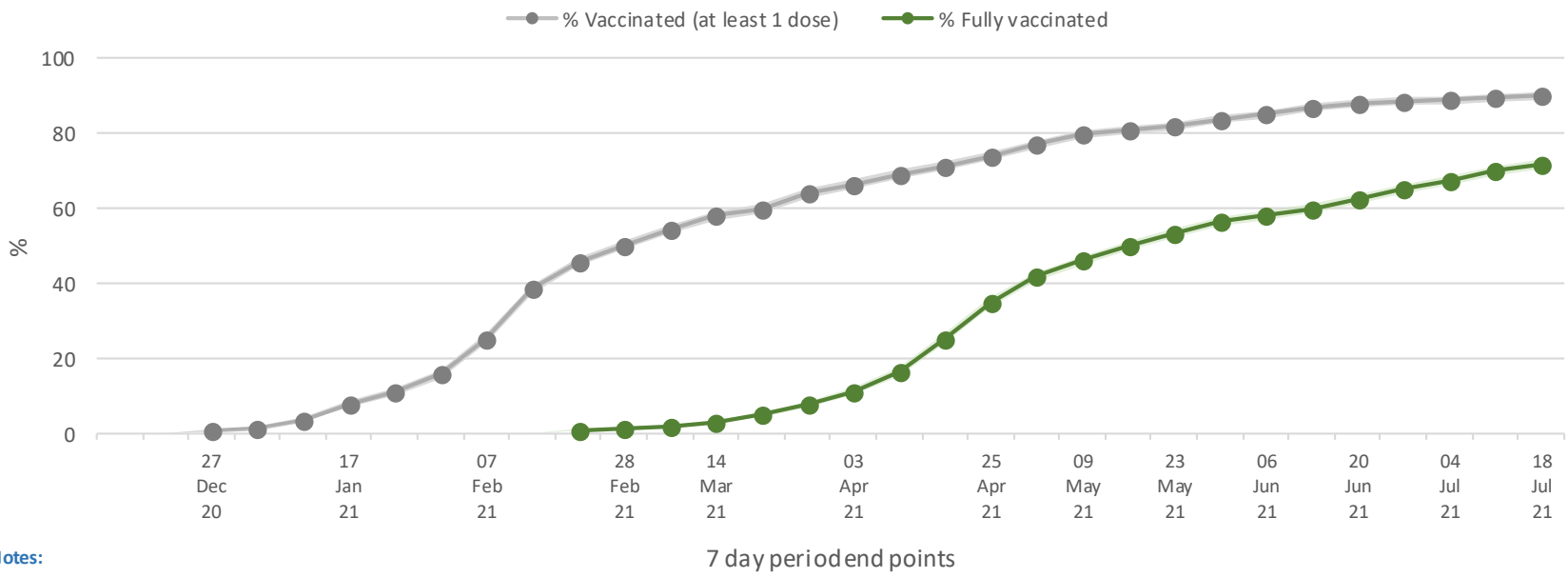
Please note that this survey does not include those that live in care homes, one of the priority groups identified by the Joint Committee on Vaccination and Immunisation (JCVI). As such, the true figure amongst the older age groups in the population may be different.

Vaccination data for Northern Ireland

This section contains estimates based on self-reported vaccines from the COVID-19 Infection Survey, which does not include people living in communal establishments, such as care homes (which have been a priority for vaccination). These estimates are not the same as the official published figures on recorded vaccinations and there may be differences between the modelled estimates and the official figures (which should give a more precise count of total vaccines issued). The estimates produced from the survey provide context and are helpful to compare with other characteristics such as testing positive for antibodies. Analysis will be further developed as more data becomes available.

The survey shows that in Northern Ireland, an estimated 89.9% (95% credible interval: 88.8% to 90.9%) of the adult population have been vaccinated (i.e. who have received at least one dose) against SARS-CoV-2 in the week 12th July – 18th July 2021. The proportion fully vaccinated is estimated to be 71.7% (95% credible interval: 70.4% to 73.0%).

Figure 3: Modelled estimates of vaccination (at least 1 dose) and fully vaccinated – Northern Ireland



Notes:

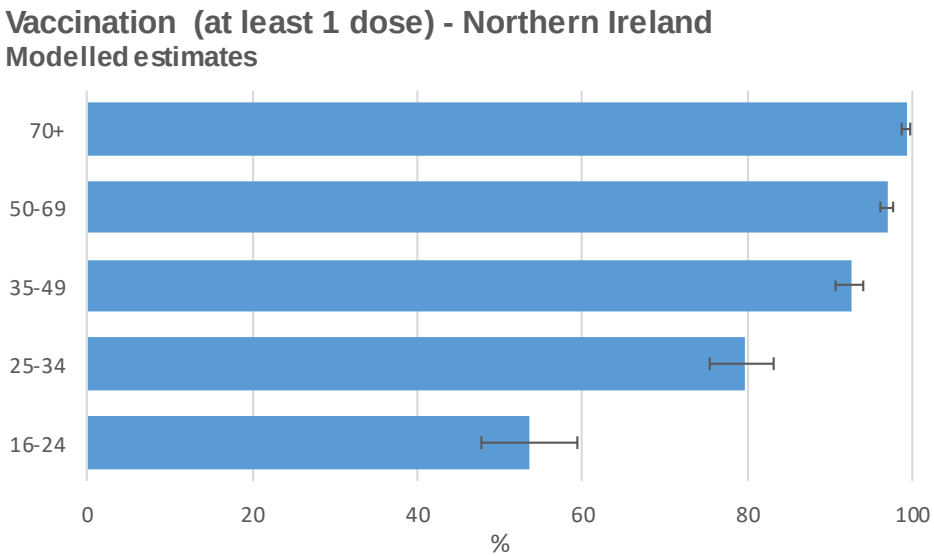
1. All results are provisional and subject to revision.
2. These statistics refer to vaccinations in individuals living in the community i.e. private households. These figures exclude individuals in hospitals, care homes and/or other institutional settings.
3. All estimates are subject to uncertainty, given that a sample is only part of the wider population. A credible interval gives an indication of the uncertainty of an estimate from data analysis. 95% credible intervals are calculated so that there is a 95% probability of the true value lying in the interval.
4. The denominators used for vaccinations are the total people in the sample at that particular time point, then it is post-stratified by the mid-year population estimate.
5. Whilst it would be expected that the overall trend of the estimated number of people who have received vaccines to increase, it is possible that in some weeks, the estimate may remain the same or decrease as a result of sampling variability (for example, we may have a lower number of participants recording a vaccination in the latest week compared with an earlier week).

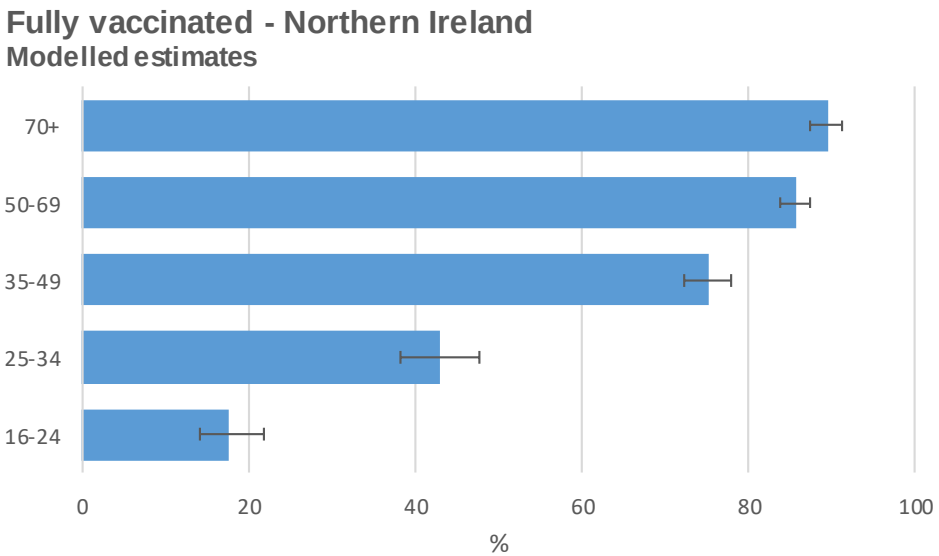
Vaccination data by age for Northern Ireland

In Northern Ireland, in the week beginning 12th July 2021, the percentage of people who have been vaccinated against SARS-CoV-2 (at least one dose) aged 70 years and over was 99.3% (95% credible interval: 98.7% to 99.6%). The percentage of people in the other age groups that had received at least one dose of a vaccine ranged from 53.5% to 97.1%. The percentage of people aged 70 years and over that had been fully vaccinated in the week beginning 12th July 2021, was 89.6% (95% credible interval: 87.4% to 91.3%). A range of charts are presented in Appendix 3 showing vaccinations in each age band over time.

Credible intervals are wide and the sample sizes relatively small, meaning there is greater uncertainty in these figures.

Figure 4a & 4b: Modelled percentage of people that have received COVID-19 vaccine by age in Northern Ireland
12 July 2021 to 18 July 2021



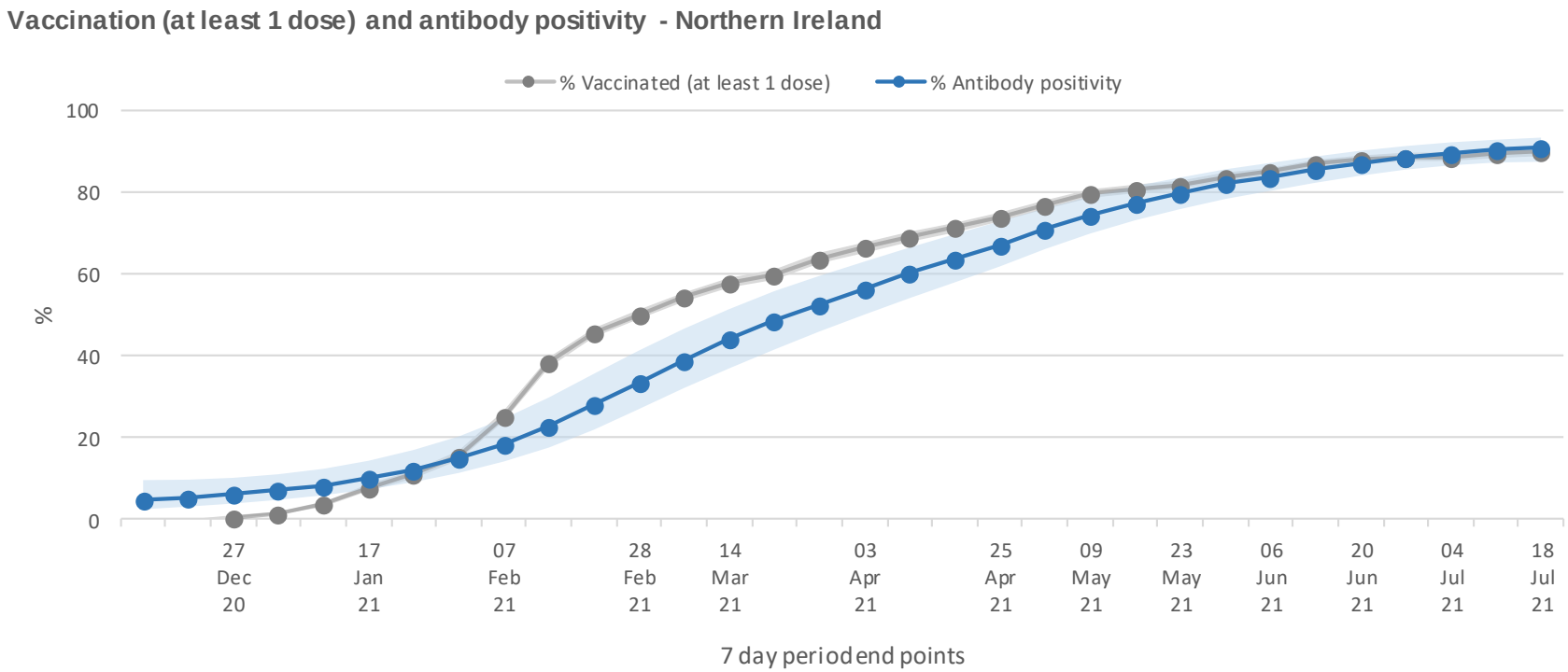


Please note that this survey does not include those that live in care homes, one of the priority groups identified by the Joint Committee on Vaccination and Immunisation (JCVI). As such, the true figure amongst the older age groups in the population may be different.

Antibody and vaccination data for Northern Ireland

Figure 5 below shows the modelled estimates of the percentage of people that have received one or more dose of a COVID-19 vaccine alongside the estimates of people testing positive for antibodies. Modelled estimates of vaccination and antibody positivity by age-group are set out in Appendix 4.

Figure 5: Modelled % of people that have received one or more doses of a COVID-19 vaccine and of people testing positive for antibodies to SARS-CoV-2



In Northern Ireland, as in all of the four countries of the UK, there is a clear pattern between vaccination and testing positive for COVID-19 antibodies however the detection of antibodies alone is not a precise measure of the immunity protection acquired from vaccination.

Likelihood of testing positive for COVID-19 antibodies in the rest of the UK

- In England, it is estimated that over 9 in 10 adults, or 93.6% of the adult population (95% credible interval: 92.5% to 94.5%) would have tested positive for antibodies against SARS-CoV-2 on a blood test in the week beginning 12th July 2021, suggesting they had the infection in the past or have been vaccinated.
- In Wales, it is estimated that over 9 in 10 adults, or 93.2% of the adult population (95% credible interval: 91.7% to 94.4%) would have tested positive for antibodies against SARS-CoV-2 on a blood test in the week beginning 12th July 2021, suggesting they had the infection in the past or have been vaccinated.
- In Scotland, it is estimated that over 9 in 10 adults, or 92.5% of the adult population (95% credible interval: 91.0% to 93.7%) would have tested positive for antibodies against SARS-CoV-2 on a blood test in the week beginning 12th July 2021, suggesting they had the infection in the past or have been vaccinated.

Self-reported vaccination estimates in the rest of the UK

- In England, an estimated 91.8% (95% credible interval: 90.9% to 92.7%) of the adult population have been vaccinated against SARS-CoV-2 (at least one dose) in the week beginning 12th July 2021.
- In Wales, an estimated 88.0% (95% credible interval: 85.9% to 90.1%) of the adult population have been vaccinated against SARS-CoV-2 (at least one dose) in the week beginning 12th July 2021.
- In Scotland, an estimated 90.0% (95% credible interval: 88.1% to 92.1%) of the population have been vaccinated against SARS-CoV-2 (at least one dose) in the week beginning 12th July 2021.

Please note these estimates are not the same as the official published figures on recorded vaccinations and there may be differences between the modelled estimates and the official figures, which are a more precise count of total vaccines issued.

Antibody and vaccination data across the UK

The percentage of adults that would have tested positive for COVID-19 antibodies continued to increase across the UK in recent weeks. In the week beginning 12 July 2021, estimates suggest the percentage of adults who reported they had received at least one dose of a COVID-19 vaccine ranged from 88.0% to 91.8% of adults across the UK. The estimated percentage of adults who are fully vaccinated continued to increase, ranging from 68.5% and 76.9% across the UK in the week beginning 12 July 2021.

The survey shows that in recent weeks up to the week beginning 12 July 2021, the percentage of adults testing positive for antibodies increased or remained high for all age groups across all four UK countries.

Antibody positivity increases with age, with the highest percentage testing positive for antibodies in the older age groups and lowest among the youngest groups across the four UK countries; reflecting the age prioritisation in vaccination programmes in place across the UK. The percentage of adults who have received at least one dose of a COVID-19 vaccination is lowest in the younger age groups but is increasing. Across the four UK countries, the estimated percentage of adults aged 25 to 34 who have received one or more doses of a coronavirus (COVID-19) vaccination ranged from 79.6% to 90.2% - this has increased sharply since the end of May. A similar increase can be seen for those aged 16 to 24 years since June, with between 43.6% and 54.7% reporting having had at least one dose of a COVID-19 vaccine across the UK in the week beginning 12 July 2021.

When antibodies are measured over time by age, it is possible to see the impact of the vaccination programme between first and second doses. In March 2021, antibody positivity decreased among people aged over 80 and has since increased as a result of second doses. A similar decrease and subsequent increase was seen in those in their 70s at the end of March 2021, and for those in their 60s and 50s antibody positivity flattened before increasing in April 2021 and May 2021 respectively.

The percentage of adults testing positive for antibodies varies by age group between the four nations of the UK. This could be explained by different historical trends in COVID-19 infection rates and the approaches to vaccine distribution in different nations.

Appendix 1 - Antibody data over time for Northern Ireland

Weekly period		Modelled % testing positive for COVID-19 antibodies	95% credible interval	
From	To		Lower	Upper
07 Dec 2020	13 Dec 2020	5.0%	2.5%	9.6%
14 Dec 2020	20 Dec 2020	5.5%	3.1%	9.7%
21 Dec 2020	27 Dec 2020	6.2%	3.9%	10.2%
28 Dec 2020	03 Jan 2021	7.2%	4.8%	11.0%
04 Jan 2021	10 Jan 2021	8.4%	5.9%	12.4%
11 Jan 2021	17 Jan 2021	10.1%	7.4%	14.3%
18 Jan 2021	24 Jan 2021	12.2%	9.1%	17.0%
25 Jan 2021	31 Jan 2021	14.9%	11.4%	20.3%
01 Feb 2021	07 Feb 2021	18.5%	14.2%	24.6%
08 Feb 2021	14 Feb 2021	22.8%	17.6%	29.8%
15 Feb 2021	21 Feb 2021	28.0%	21.9%	35.6%
22 Feb 2021	28 Feb 2021	33.7%	27.0%	41.3%
01 Mar 2021	07 Mar 2021	39.0%	32.1%	46.6%
08 Mar 2021	14 Mar 2021	44.0%	36.9%	51.4%
15 Mar 2021	21 Mar 2021	48.6%	41.5%	55.8%
22 Mar 2021	28 Mar 2021	52.7%	45.9%	59.5%
29 Mar 2021	03 Apr 2021	56.5%	50.1%	63.0%
05 Apr 2021	11 Apr 2021	60.2%	54.1%	66.4%
12 Apr 2021	18 Apr 2021	63.8%	57.9%	69.7%
19 Apr 2021	25 Apr 2021	67.3%	61.8%	72.8%
26 Apr 2021	02 May 2021	71.0%	66.1%	76.0%
03 May 2021	09 May 2021	74.4%	69.8%	78.9%
10 May 2021	16 May 2021	77.2%	73.1%	81.5%
17 May 2021	23 May 2021	79.7%	75.8%	83.5%
24 May 2021	30 May 2021	81.9%	78.3%	85.5%
31 May 2021	06 Jun 2021	83.7%	80.3%	87.1%
7 Jun 2021	10 Jun 2021	85.5%	82.3%	88.7%
14 Jun 2021	20 Jun 2021	87.1%	84.0%	90.1%
21 Jun 2021	27 Jun 2021	88.5%	85.5%	91.2%
28 Jun 2021	04 Jul 2021	89.5%	86.5%	92.1%
05 Jul 2021	11 Jul 2021	90.3%	87.2%	92.8%
12 Jul 2021	18 Jul 2021	90.7%	87.4%	93.3%

Source: Office for National Statistics - Coronavirus (COVID-19) Infection Survey

Notes:

1. All results are provisional and subject to revision.

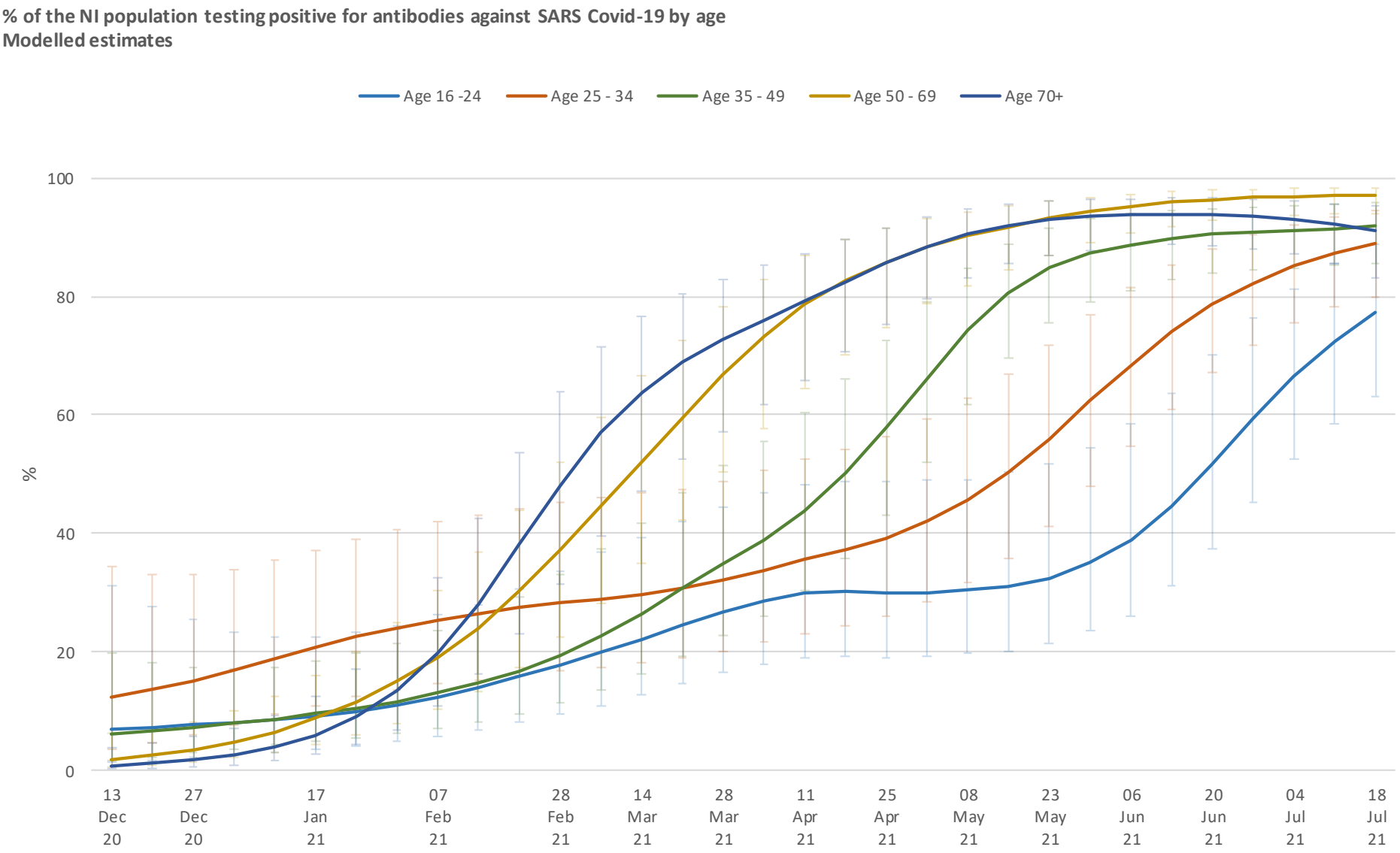
2. These statistics refer to infections reported in the community, by which we mean private households. These figures exclude infections reported in hospitals, care homes and/or other institutional settings.

3. All estimates are subject to uncertainty, given that a sample is only part of the wider population. A credible interval gives an indication of the uncertainty of an estimate from data analysis. 95% credible intervals are calculated so that there is a 95% probability of the true value lying in the interval.

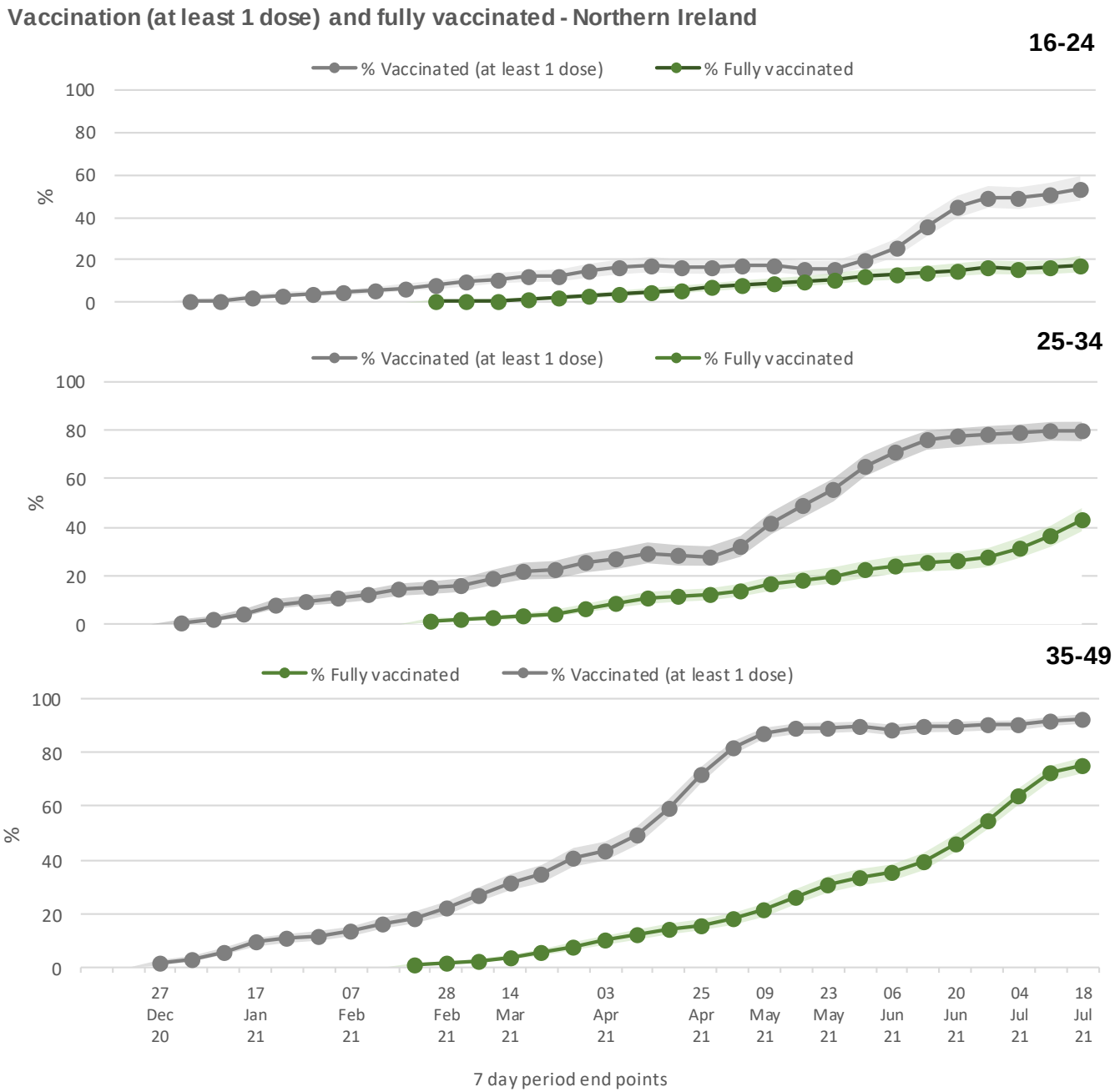
4. The Northern Ireland population used in this analysis relates to the community population aged 16 years and over. It is not the same as the total population of NI which is reported in the official mid-year population estimates.

5. To provide the most timely and accurate estimates possible for antibody positivity, the most recent week will include data for the first four to seven days of the week, depending on the availability of test results.

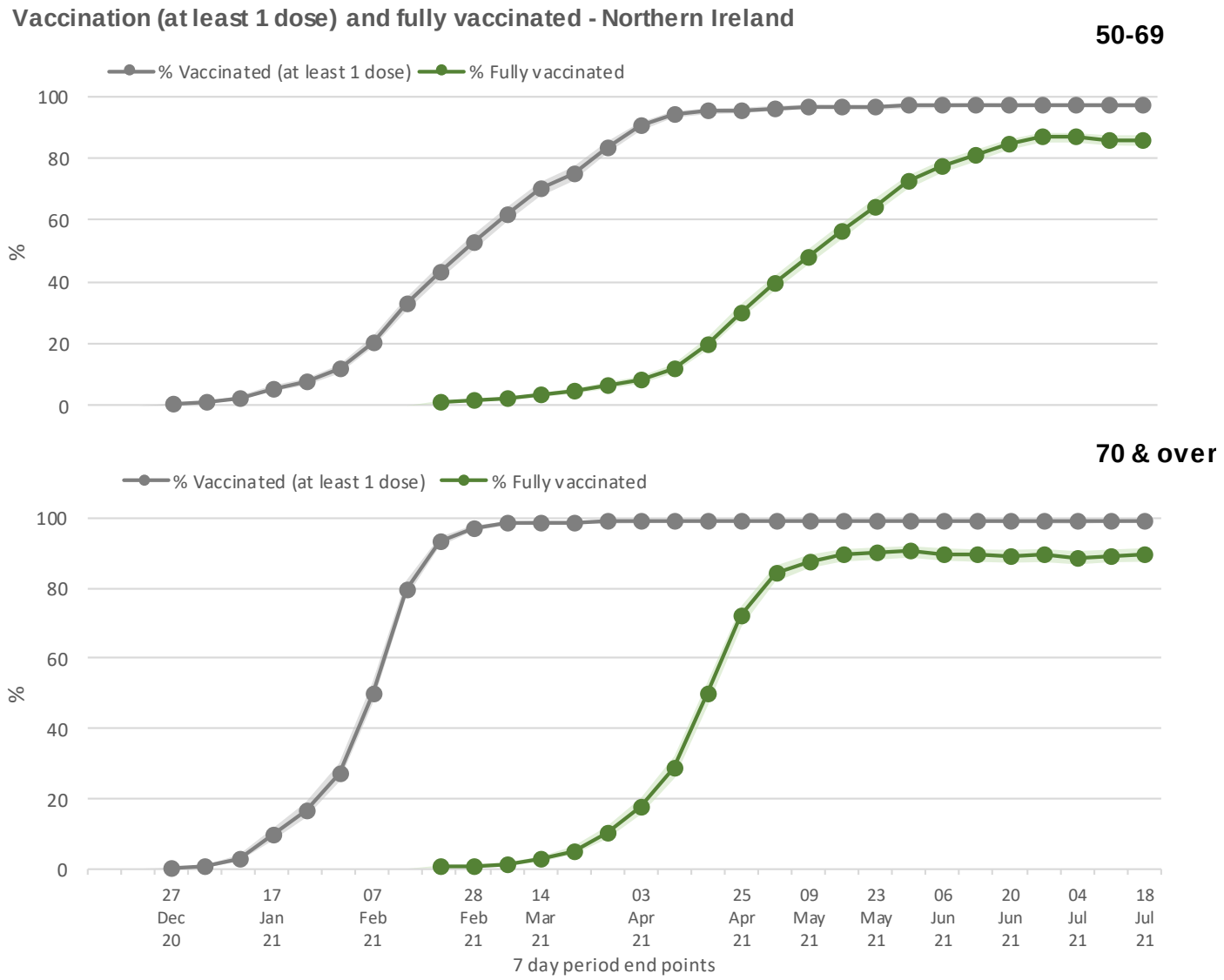
Appendix 2 - Age over time analysis on the likelihood of testing positive for COVID-19 antibodies



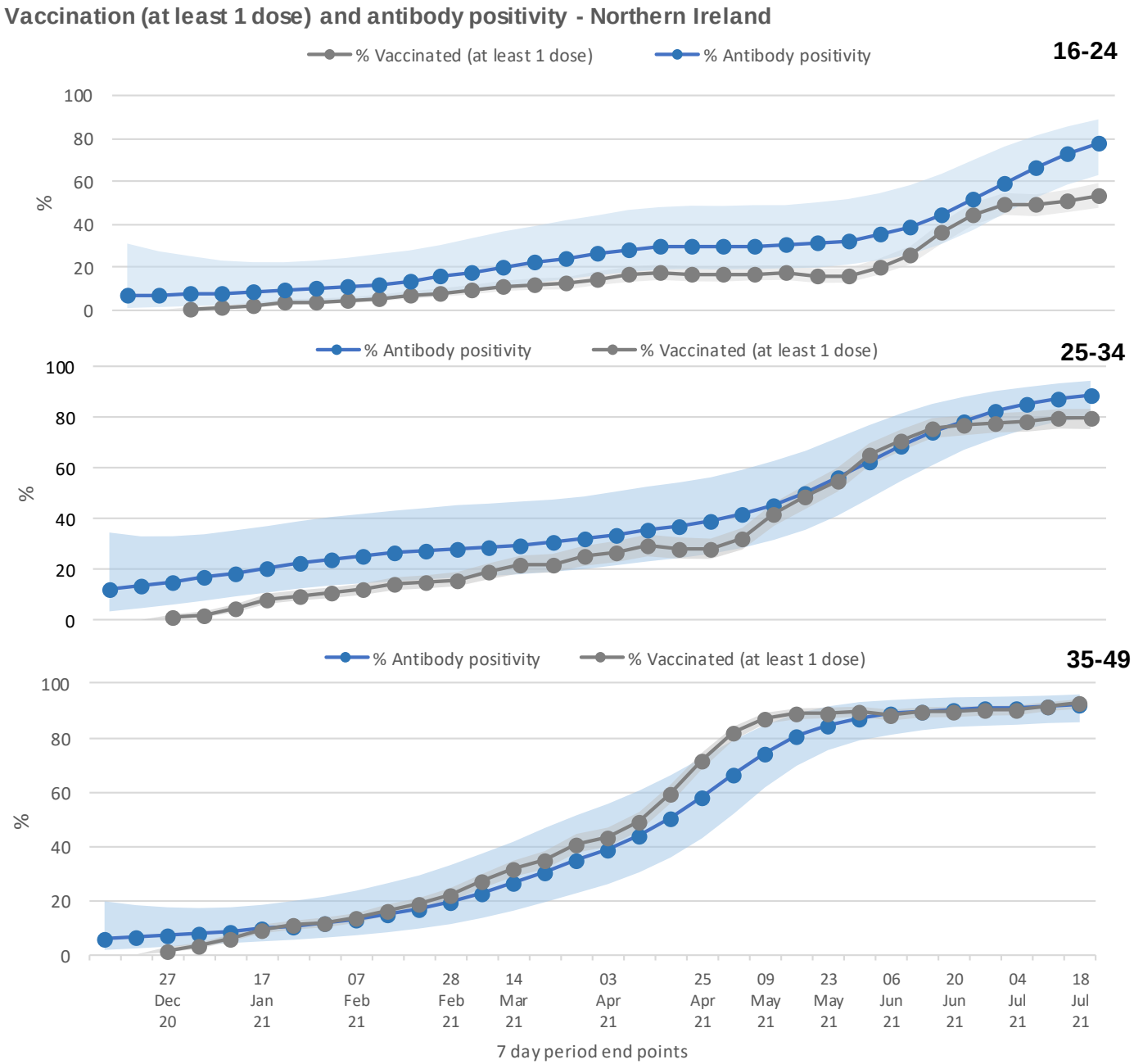
Appendix 3 - Vaccination (at least 1 dose) and fully vaccinated by age



Appendix 3 - Vaccination (at least 1 dose) and fully vaccinated by age (continued)

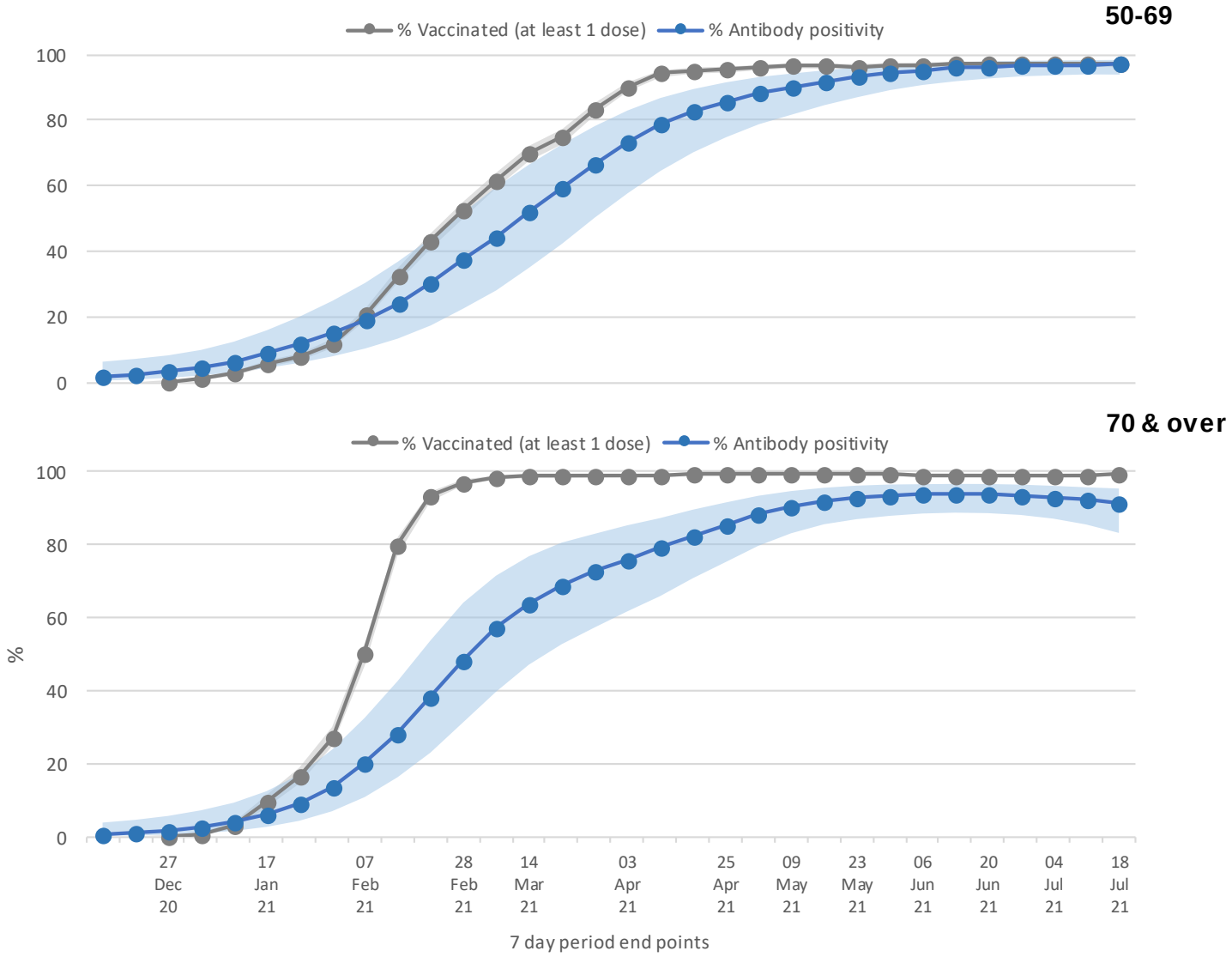


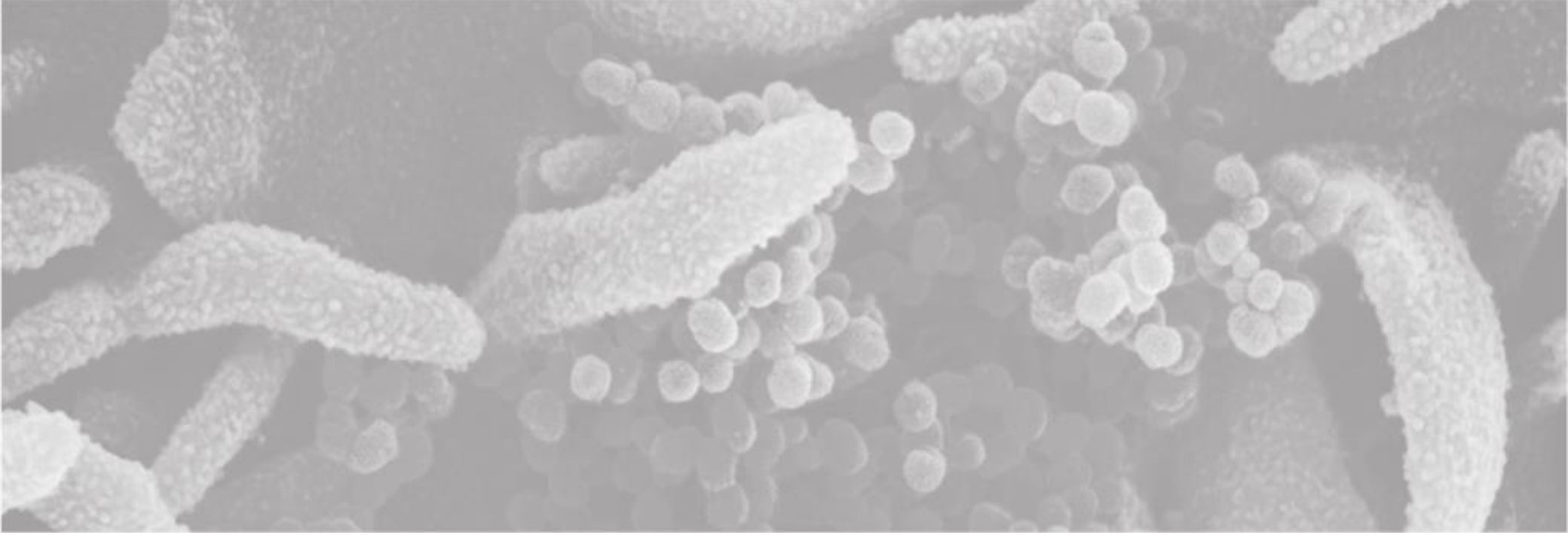
Appendix 4 - Age over time analysis on vaccination and antibody positivity



Appendix 4 - Age over time analysis on vaccination and antibody positivity (continued)

Vaccination (at least 1 dose) and antibody positivity - Northern Ireland





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