Article

Coronavirus (COVID-19) Infection Survey technical article: Characteristics associated with third vaccination uptake: 21 April 2022

Analysis of populations in the UK by likelihood of having received a third vaccination against COVID-19 using the Coronavirus (COVID-19) Infection Survey. This survey is being delivered in partnership with University of Oxford, University of Manchester, UK Health Security Agency and Wellcome Trust.

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Table of contents

1 . Main points

Across all ages, of those eligible, the following groups were less likely to have received a third coronavirus (COVID-19) vaccination:

- those living in a more deprived area or identifying as non-white ethnic minorities

- those working outside the home for five or more days per week

- those who have been infected with COVID-19 previously

Additionally, for those eligible aged 18 to 64 years, the following groups were less likely to have received a third COVID-19 vaccination:

- those who smoke tobacco or vape

- those working in the hospitality or manufacturing sectors, or who are not currently working, or who are working entirely from home (compared with those working one or two days a week outside of the home)

- males

About this article

This technical article presents the methods and results used to identify characteristics related to uptake of a third COVID-19 vaccination, using data from 21 February to 20 March 2022. The article uses a statistical model to examine which characteristics of people sampled in our Coronavirus (COVID-19) Infection Survey (CIS) are associated with those who did and did not report having received a third vaccination against COVID-19 of those who were eligible.

Eligibility for receiving a third vaccination was defined as those adults who had received their second vaccination at least three months ago. This was defined as three 28-day periods; 84 days. Adults who had not received any vaccinations, or had received only one vaccination or a second vaccination within the previous three months were not eligible and have not been included in this analysis.

Those eligible for a third vaccination and vaccination rates differed considerably by age, mainly because of first and second vaccinations occurring at different times in different age groups. Adults are now only eligible for a third vaccination if their second vaccination was at least three months ago, but this has also varied over time, being initially six months. This meant that people then became eligible for their third vaccination at different times.
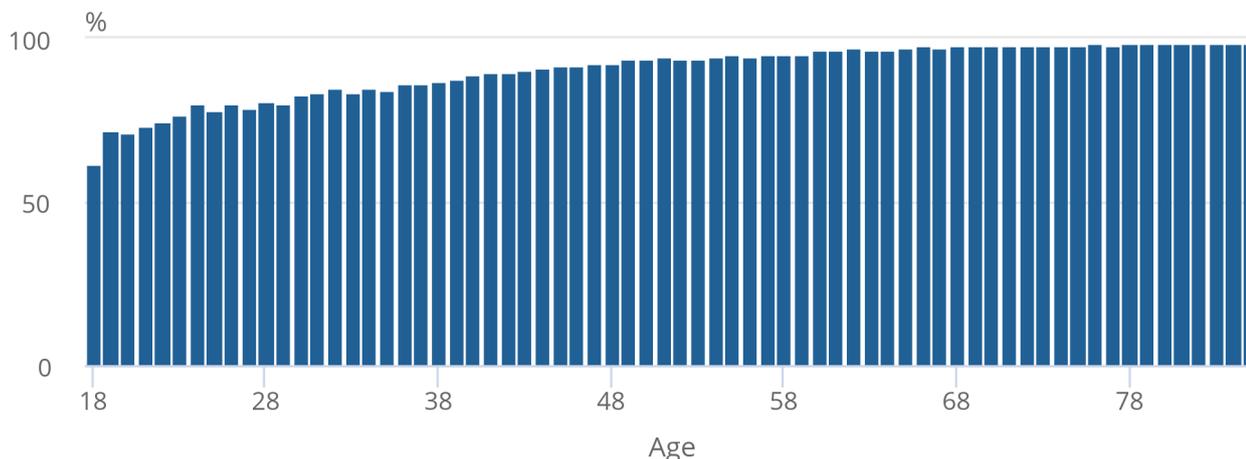
Analysis was restricted to eligible participants in the following age groups: 18 to 34 years, 35 to 64 years, and those aged 65 years and over. These age groups were also used in our previous article, CIS technical article: Analysis of characteristics associated with vaccination uptake. Third vaccination uptake within these groups is summarised in Figure 1.

Figure 1: A higher percentage of older people reported having received a third coronavirus (COVID-19) vaccination

The percentage of people who reported receiving a third COVID-19 vaccination by age, 21 February to 20 March 2022

Figure 1: A higher percentage of older people reported having received a third coronavirus (COVID-19) vaccination

The percentage of people who reported receiving a third COVID-19 vaccination by age, 21 February to 20 March 2022

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

Notes:

1. Estimates are based on adults in the survey who had received their second COVID-19 vaccination at least 84 days ago and are therefore eligible for a third vaccination.

About this analysis: vaccination data

This analysis used vaccination status reported by participants taking part in the Office for National Statistics' (ONS) Coronavirus (COVID-19) Infection Survey (CIS). CIS is a large household survey monitoring COVID-19 infections within private households in the UK. It excludes those in hospitals, care homes, or other communal establishments. Participants are asked about demographics, living environment, behaviours, work, and vaccination uptake. Further information on the study design can be found in COVID-19 Infection Survey: methods and further information.

Daily official government vaccination figures provide the recorded actual numbers of vaccinations against SARS-CoV-2. Our vaccination estimates are likely to differ from the official figures because they are estimates based on a sample survey. In addition, our sampling method for Northern Ireland is different to the other UK nations. Our method in Northern Ireland is to only invite people who have previously participated in a Northern Ireland Statistics and Research Agency (NISRA) survey, which could result in a sample of individuals who are more likely to get vaccinated.

Differences between official figures and the estimates from this survey may also vary in scale across each of the four UK nations (with some survey estimates closer to the official reported figures than others). This is because of differences in reporting dates and the inclusion of National Immunisation Management System (NIMS) data for England. We use NIMS data where it is available for survey participants, and use self-reported vaccination status where NIMS information is not available. Adding this information improves the quality of the data we have for England. The equivalent of NIMS is currently not available for other countries, so vaccination estimates for Wales, Scotland, and Northern Ireland are produced only from self-reported vaccination status. This means that vaccination estimates may differ more for these countries because they rely on the accuracy of participants' reporting of how many vaccinations they have received. To make sure that comparisons of other characteristics are not affected by this, we control for country and region in all estimates.

About this analysis: regression models

In this analysis, two logistic regression models were run for each of the three age groups: 18 to 34 years, 35 to 64 years, and those aged 65 years and over. Our outcome was third vaccination status - defined as a participant having received three COVID-19 vaccinations prior to their most recent survey visit, which took place in the 28-day period from 21 February to 20 March 2022. The models included all participants across the UK who had received a second vaccination more than 84 days ago (three 28-day periods ago) and were therefore eligible for their third vaccination.

Our first model, Model 1 (the core model), estimated the likelihood of an individual having received a third vaccination, for eight core demographic characteristics:

- sex

- ethnicity

- age

- geographical region

- urban or rural classification of their address

- deprivation percentile

- household size

- whether the household was multigenerational

These characteristics are related to each other, for example some regions have higher levels of deprivation. To estimate the impact of each characteristic on its own, we need to control for the impact of all of these factors in one model. Model 1 estimated the total effect of these core demographic characteristics on the likelihood of having a third vaccination and included all participants. The model gives the overall effect of these factors and does not try to estimate how much of these overall effects might be explained by other factors such as work status.

Model 2 tested whether other factors that may change over time, such as work status, affected the likelihood of having had a third vaccination. The core characteristics can affect the likelihood of being vaccinated both directly and indirectly through other factors (such as work status or health status). Therefore, for this second group of characteristics, we also adjusted for the core demographic characteristics. This means that we can say, for example, that people aged 35 to 64 years were less likely to have received a third vaccination if they were not working between 21 February and 20 March 2022, regardless of where in the UK they lived, or whether they were a man or a woman. It also means that when looking at results for Model 2, we do not draw conclusions about the core demographic characteristics from Model 1. Work status was included in Model 2 for each of the three age groups.

Having tested the different characteristics for Model 2, we only included characteristics that were associated with whether someone reported having had a third vaccination independently of the other characteristics. We did this using a backward elimination technique, with a significance threshold of 0.05.

Both models were used for all three age groups. Outputs of each model are presented in the accompanying dataset.

2 . Ages 18 to 34 years

This analysis used data from 21 February to 20 March 2022. During this period, 37,263 people aged 18 to 34 years had survey visits, of whom 33,710 participants were eligible for their third coronavirus (COVID-19) vaccination (who had received their second vaccination at least 84 days ago). We restricted analysis to this subset, of whom 26,848 (80%) participants reported having received a third vaccination.

Model 1

Figure 2 presents findings from Model 1 for those aged 18 to 34 years who were eligible. Key findings are that:

- those who lived in more deprived areas were less likely to have received a third vaccination

- those identifying as non-white ethnic minorities were less likely to have received a third vaccination than those reporting white ethnicities

- those from three, four, or five plus person households were less likely to have received a third vaccination compared with those from single person households

- females were more likely to have received a third vaccination than males

- those living in rural villages were more likely to have received a third vaccination than those living in major urban areas

Results for other characteristics included in the model can be found in the accompanying dataset.

Figure 2: Among those aged 18 to 34 years, males, those from larger households, those living in more deprived areas, and those identifying as non-white ethnic minorities were less likely to have received a third coronavirus (COVID-19) vaccination

The likelihood of having received a third vaccination against COVID-19 by core demographic characteristics, 18 to 34 years, UK, 21 February to 20 March 2022

Notes:

1. Estimates are based on adults who had received their second COVID-19 vaccination at least 84 days ago and are therefore eligible for a third vaccination.

2. Estimates are subject to uncertainty, given that a sample is only part of the wider population. The model provides 95% confidence intervals around the estimates.

3. A household was classed as multigenerational if it included individual(s) aged school Year 11 or younger and individual(s) aged school Year 12 to age 49 years and individual(s) aged 50 years and over.

4. Deprivation is based on an index of multiple deprivation (IMD) score or equivalent scoring method for the devolved administrations. This score ranges from 1, which represents the highest level of deprivation, up to 100, which represents the least deprived. The odds ratio shows how a 10 unit increase in deprivation score, which is equivalent to 10 percentiles or 1 decile, affects the likelihood of having received a third COVID-19 vaccination.

5. An odds ratio indicates the likelihood of an individual having received a third vaccination against COVID-19 given a particular characteristic. When a characteristic has an odds ratio of one, this means there is neither an increase nor a decrease in the likelihood of the participant having received a third vaccination, compared with the reference category for that characteristic. An odds ratio greater than one indicates an increased likelihood of the participant having received a third vaccination compared with the reference category. An odds ratio less than one indicates a decreased likelihood of the participant having received a third vaccination compared with the reference category.

Download the data

Model 2

Figure 3 presents the effects of additional factors on the likelihood of having received a third vaccination against COVID-19 for those aged 18 to 34 years. Key findings are that those:

- working outside the home one to three days per week were more likely to have received a third vaccination than those working entirely from home, whereas those not currently working, unemployed or working outside the home five or more days per week were less likely to have received a third vaccination

- working in the education, government, healthcare or IT sectors were more likely to have received a third vaccination, whereas those working in the hospitality, manufacturing, personal services, or transport sectors were less likely to have received a third vaccination

- attending a hospital, or living with someone who had, were more likely to have received a third vaccination

- with a disability, or who live with someone with a disability, were more likely to have received a third vaccination

- who had travelled abroad in the last 28 days were more likely to have received a third vaccination

- living with a child were less likely to have received a third vaccination

- who had been infected with COVID-19 previously were less likely to have received a third vaccination

- who smoke tobacco or vape were less likely to have received a third vaccination

Figure 3: Among those aged 18 to 34 years, the likelihood of having received a third coronavirus (COVID-19) vaccination varied across work sector, work status and for those who had been infected with COVID-19 previously

The likelihood of having received a third COVID-19 vaccination, by characteristic, 18 to 34 years, UK, 21 February to 20 March 2022

Notes:

1. Estimates are based on adults who had received their second COVID-19 vaccination at least 84 days ago and are therefore eligible for a third vaccination.

2. Estimates are subject to uncertainty, given that a sample is only part of the wider population. The model provides 95% confidence intervals around the estimates.

3. The core demographic characteristics from Model 1 are included to adjust for these factors. We do not draw conclusions about the core demographic characteristics in this model.

4. Personal services workers provide services related to travel, housekeeping, catering and hospitality, hairdressing and beauty treatments, animal care grooming and training, companionship and other services of a personal nature.

5. An odds ratio indicates the likelihood of an individual having received a third vaccination against COVID-19 given a particular characteristic. When a characteristic has an odds ratio of one, this means there is neither an increase nor a decrease in the likelihood of the participant having received a third vaccination, compared with the reference category for that characteristic. An odds ratio greater than one indicates an increased likelihood of the participant having received a third vaccination compared with the reference category. An odds ratio less than one indicates a decreased likelihood of the participant having received a third vaccination compared with the reference category.

6. Work sectors are included as binary factors with each sector compared with a reference group. The reference group comprises those working in sectors that were not found to be statistically significant for that model. This means that the reference group differs for each of the three age groups. For those aged 18 to 34 years, the reference category contained those who worked in the armed forces, social care, food production, retail, financial, arts and "other" sectors.

7. Previous infection considered both whether an individual tested positive and when that infection was. Infections before 15 November 2020 were categorised as occurring in the "Pre-Alpha" period. Infections occurring between 15 November 2020 and 17 May 2021 were categorised as occurring in the "Alpha" period. Infections occurring after 17 May 2021 were categorised as occurring in the "Delta" period. In cases of multiple previous infections, the most recent infection period was used.

Download the data

3 . Ages 35 to 64 years

This analysis used data from 21 February to 20 March 2022. During this period, 164,961 people aged 35 to 64 years had survey visits, of whom 160,705 participants were eligible for their third coronavirus (COVID-19) vaccination (who had received their second vaccination at least 84 days ago). We restricted analysis to this subset, of whom 149,583 (93%) participants reported having received a third vaccination.

Model 1

Figure 4 presents findings from Model 1 for those aged 35 to 64 years who were eligible. Key findings are that:

- those who lived in more deprived areas were less likely to have received a third vaccination

- those identifying as non-white ethnic minorities were less likely to have received a third vaccination compared with those reporting white ethnicity

- those from two person households were more likely to have received a third vaccination, whereas those from five plus person households were less likely to have received a third vaccination compared with those from single person households

- those living in multigenerational households were more likely to have received a third vaccination

- females were more likely to have received a third vaccination than males

- those living in urban cities or towns, or rural towns, or rural villages, were more likely to have received a third vaccination than those living in major urban areas

Results for other characteristics included in the model can be found in the accompanying dataset.

Figure 4: Among those aged 35 to 64 years, males and those identifying as non-white ethnic minorities were less likely to have received a third vaccination than those reporting white ethnicity

The likelihood of having received a third coronavirus (COVID-19) vaccination by core demographic characteristics, 35 to 64 years, UK, 21 February to 20 March 2022

Notes:

1. Estimates are based on adults who had received their second COVID-19 vaccination at least 84 days ago and are therefore eligible for a third vaccination.

2. Estimates are subject to uncertainty, given that a sample is only part of the wider population. The model provides 95% confidence intervals around the estimates.

3. A household was classed as multigenerational if it included individual(s) aged school Year 11 or younger and individual(s) aged school Year 12 to age 49 years and individual(s) aged 50 years or over.

4. Deprivation is based on an index of multiple deprivation (IMD) score or equivalent scoring method for the devolved administrations. This score ranges from 1, which represents the highest level of deprivation, up to 100, which represents the least deprived. The odds ratio shows how a 10 unit increase in deprivation score, which is equivalent to 10 percentiles or 1 decile, affects the likelihood of having received a third COVID-19 vaccination.

5. An odds ratio indicates the likelihood of an individual having received a third vaccination against COVID-19 given a particular characteristic. When a characteristic has an odds ratio of one, this means there is neither an increase nor a decrease in the likelihood of the participant having received a third vaccination, compared with the reference category for that characteristic. An odds ratio greater than one indicates an increased likelihood of the participant having received a third vaccination compared with the reference category. An odds ratio less than one indicates a decreased likelihood of the participant having received a third vaccination compared with the reference category.

Download the data

Model 2

Figure 5 presents the effects of additional factors on the likelihood of having received a third vaccination against COVID-19 for those aged 35 to 64 years. Key findings are that those:

- who were retired were more likely to have received a third vaccination compared with those in employment, whereas those not currently working or who were unemployed were less likely to have received a third vaccination

- working outside the home one or two days per week were more likely to have received a third vaccination compared with those not working outside the home, whereas those working outside the home four days or more per week were less likely to have received a third vaccination

- working in the arts, education, finance, government, healthcare, IT, or "other" sectors were more likely to have received a third vaccination, whereas those working in a care home or in the food production, hospitality, manufacturing, personal services, or transport sectors were less likely to have received a third vaccination

- who had attended a hospital were more likely to have received a third vaccination

- who had travelled abroad in the last 28 days were more likely to have received a third vaccination

- who had been infected with COVID-19 previously were less likely to have received a third vaccination

- who smoke tobacco or vape were less likely to have received a third vaccination

Figure 5: Among those aged 35 to 64 years, the likelihood of having received a third coronavirus (COVID-19) vaccination varied across work sector and for those who had been infected with COVID-19 previously, as well as other factors

The likelihood of having received a third COVID-19 vaccination, by characteristic, 35 to 64 years, UK, 21 February to 20 March 2022

Notes:

1. Estimates are based on adults who had received their second COVID-19 vaccination at least 84 days ago and are therefore eligible for a third vaccination.

2. Estimates are subject to uncertainty, given that a sample is only part of the wider population. The model provides 95% confidence intervals around the estimates.

3. The core demographic characteristics from Model 1 are included to adjust for these factors. We do not draw conclusions about the core demographic characteristics in this model.

4. An odds ratio indicates the likelihood of an individual having received a third vaccination against COVID-19 given a particular characteristic. When a characteristic has an odds ratio of one, this means there is neither an increase nor a decrease in the likelihood of the participant having received a third vaccination, compared with the reference category for that characteristic. An odds ratio greater than one indicates an increased likelihood of the participant having received a third vaccination compared with the reference category. An odds ratio less than one indicates a decreased likelihood of the participant having received a third vaccination compared with the reference category.

5. Work sectors are included as binary factors with each sector compared with a reference group. The reference group comprises those working in sectors that were not found to be statistically significant for that model. This means that the reference group differs for each of the three age groups. For those aged 35 to 64 years, the reference category was those working in the social care, retail and armed forces sectors.

6. Previous infection considered both whether an individual tested positive and when that infection was. Infections before 15 November 2020 were categorised as occurring in the "Pre-Alpha" period. Infections occurring between 15 November 2020 and 17 May 2021 were categorised as occurring in the "Alpha" period. Infections occurring after 17 May 2021 were categorised as occurring in the "Delta" period. In cases of multiple previous infections, the most recent infection period was used.

Download the data

4 . Ages 65 years and over

This analysis used data from 21 February to 20 March 2022. During this period, 111,714 people aged 65 years and over had survey visits, of whom 110,948 participants were eligible for their third coronavirus (COVID-19) vaccination (who had received their second vaccination at least 84 days ago). We restricted analysis to this subset, of whom 108,745 (98%) participants reported having received a third vaccination.

Model 1

Figure 6 presents findings from Model 1 for those aged 65 years and over who were eligible. Key findings are that those:

- who lived in more deprived areas were less likely to have received a third vaccination

- identifying as non-white ethnic minorities were less likely to have received a third vaccination than those reporting white ethnicities

- living in multigenerational households were less likely to have received a third vaccination

- from two person households were more likely to have received a third vaccination compared with those living alone

There are fewer statistically significant associations in the oldest age group because there are far fewer people who have not received a third vaccination who were eligible to do so. As a result, the model has less power to detect effects, and the findings that it does produce have greater uncertainty, as indicated by wider confidence intervals in Figure 6.

Results for other characteristics included in the model can be found in the accompanying dataset.

Figure 6: Among those aged 65 years and over, those identifying as non-white ethnic minorities and those living in multigenerational households were less likely to have received a third coronavirus (COVID-19) vaccination

The likelihood of having received a third COVID-19 vaccination by core demographic characteristics, 65 years and over, UK, 21 February to 20 March 2022

Notes:

1. Estimates are based on adults who had received their second COVID-19 vaccination at least 84 days ago and are therefore eligible for a third vaccination.

2. Estimates are subject to uncertainty, given that a sample is only part of the wider population. The model provides 95% confidence intervals around the estimates.

3. A household was classed as multigenerational if it included individual(s) aged school Year 11 or younger and individual(s) aged school Year 12 to age 49 years and individual(s) aged 50 years or over.

4. Deprivation is based on an index of multiple deprivation (IMD) score or equivalent scoring method for the devolved administrations. This score ranges from 1, which represents the highest level of deprivation, up to 100, which represents the least deprived. The odds ratio shows how a 10 unit increase in deprivation score, which is equivalent to 10 percentiles or 1 decile, affects the likelihood of having received a third COVID-19 vaccination.

5. An odds ratio indicates the likelihood of an individual having received a third vaccination against COVID-19 given a particular characteristic. When a characteristic has an odds ratio of one, this means there is neither an increase nor a decrease in the likelihood of the participant having received a third vaccination, compared with the reference category for that characteristic. An odds ratio greater than one indicates an increased likelihood of the participant having received a third vaccination compared with the reference category. An odds ratio less than one indicates a decreased likelihood of the participant having received a third vaccination compared with the reference category.

Download the data

Model 2

Figure 7 presents the effects of additional factors on the likelihood of people aged 65 years and over having received a third vaccination against COVID-19.

Key findings are that those:

- who worked five days or more outside the home were less likely to have received a third vaccination

- working in care homes, or the personal services or transport sectors were less likely to have received a third vaccination

- with a disability that affected them a lot, or who live with someone whose disability affected them a lot, were less likely to have received a third vaccination

- who had previously been infected with COVID-19 in the pre-Alpha or Alpha periods were less likely to have received a third vaccination

Figure 7: Among those aged 65 years and over, those having had a previous coronavirus (COVID-19) infection, as well as those with a disability that affected them a lot, were less likely to have received a third COVID-19 vaccination

The likelihood of having received a third COVID-19 vaccination, by characteristic, 65 years and over, UK, 21 February to 20 March 2022

Notes:

1. Estimates are based on adults who had received their second COVID-19 vaccination at least 84 days ago and are therefore eligible for a third vaccination.

2. Estimates are subject to uncertainty, given that a sample is only part of the wider population. The model provides 95% confidence intervals around the estimates.

3. The core demographic characteristics from Model 1 are included to adjust for these factors. We do not draw conclusions about the core demographic characteristics in this model.

4. An odds ratio indicates the likelihood of an individual having received a third vaccination against COVID-19 given a particular characteristic. When a characteristic has an odds ratio of one, this means there is neither an increase nor a decrease in the likelihood of the participant having received a third vaccination, compared with the reference category for that characteristic. An odds ratio greater than one indicates an increased likelihood of the participant having received a third vaccination compared with the reference category. An odds ratio less than one indicates a decreased likelihood of the participant having received a third vaccination compared with the reference category.

5. Work sectors are included as binary factors with each sector compared with a reference group. The reference group comprises those working in sectors that were not found to be statistically significant for that model. This means that the reference group differs for each of the three age groups. For those aged 65 years and over, the reference group included the retail, manufacturing, IT, hospitality, health care, food production, education, social care, armed forces, financial, government, arts and "other" sectors.

6. Previous infection considered both whether an individual tested positive and when that infection was. Infections before 15 November 2020 were categorised as occurring in the "Pre-Alpha" period. Infections occurring between 15 November 2020 and 17 May 2021 were categorised as occurring in the "Alpha" period. Infections occurring after 17 May 2021 were categorised as occurring in the "Delta" period. In cases of multiple previous infections, the most recent infection period was used.

Download the data

5 . Findings from our previous analysis on first vaccinations

Generally, these findings are consistent with the findings from our previous analysis regarding the uptake of first coronavirus (COVID-19) vaccinations, even though the analysis of third vaccinations was restricted to those who had already had two vaccinations.

Those living in more deprived areas were consistently less likely to receive a first or third vaccination across all three age groups. For first or third vaccinations, those identifying as a non-white ethnicity were less likely to have been vaccinated than those reporting white ethnicities in the 18 to 34 years and 35 to 64 years age groups. For third vaccinations, this effect was also seen in those aged 65 years and over. Those reporting working in the hospitality, personal services, transport and manufacturing sectors had lower uptake of both first and third vaccinations in the 18 to 34 years age group. The hospitality, personal services and transport sectors also had lower vaccination uptake in the 35 to 64 years age group. Those who had been previously infected in any age group were less likely to have received first or third vaccinations.

Females were more likely to have had third vaccinations across the youngest two age groups; this effect was not observed in our analysis of first vaccinations. Those aged 18 to 64 years who had contact with care homes were more likely to have had a first vaccination. This association was not found for third vaccinations, and those who worked in a care home in the 35 to 64 years and 65 years and over age groups were less likely to have had a third vaccination.

6 . Coronavirus (COVID-19) Infection Survey data

7 . Glossary

SARS-CoV-2

This is the scientific name given to the specific virus that causes coronavirus (COVID-19).

Confidence interval

A confidence interval gives an indication of the degree of uncertainty of an estimate, showing the precision of a sample estimate. The 95% confidence intervals are calculated so that if we repeated the study many times, 95% of the time the true unknown value would lie between the lower and upper confidence limits. A wider interval indicates more uncertainty in the estimate. For more information, see our methodology page on statistical uncertainty.

Odds ratio

An odds ratio indicates the likelihood of an individual having received a third vaccination against COVID-19 given a particular characteristic. When a characteristic has an odds ratio of one, this means there is neither an increase nor a decrease in the likelihood of the participant having received a third vaccination, compared with the reference category for that characteristic. An odds ratio greater than one indicates an increased likelihood of the participant having received a third vaccination compared with the reference category. An odds ratio less than one indicates a decreased likelihood of the participant having received a third vaccination compared with the reference category.

Deprivation

Deprivation is based on an index of multiple deprivation (IMD) score or equivalent scoring method for the devolved administrations. This score ranges from 1, which represents the highest level of deprivation, up to 100, which represents the least deprived. The odds ratio shows how a 10 unit increase in deprivation score, which is equivalent to 10 percentiles or 1 decile, affects the likelihood of having received a third COVID-19 vaccination.

Multigenerational household

A household was classed as multigenerational if it included individual(s) aged school Year 11 or younger and individual(s) aged school Year 12 to aged 49 years and individual(s) aged 50 years and over.

Previous infection

Previous infection considered both whether an individual tested positive and when that infection was. Infections before 15 November 2020 were categorised as occurring in the "Pre-Alpha" period. Infections occurring between 15 November 2020 and 17 May 2021 were categorised as occurring in the "Alpha" period. Infections occurring after 17 May 2021 were categorised as occurring in the "Delta" period. In cases of multiple previous infections, the most recent infection period was used.

Work sectors

Work sectors are included as binary factors with each sector compared with a reference group. The reference group comprises those working in sectors that were not found to be statistically significant for that model. This means that the reference group differs for each of the three age groups.

Arts

The arts sector includes those working in entertainment or recreation.

Food production

Food production workers include those working in agriculture and farming.

Government

Government workers include those working in the Civil Service or local government.

Healthcare

Healthcare workers include those working in primary care (for example, GPs or dentists), secondary care (for example, hospital workers) and other health services (for example, mental health services).

Hospitality

Hospitality workers include those working in hotels, restaurants, or cafes.

Manufacturing

Manufacturing workers include those working in construction.

Personal Services

Personal services workers provide services related to travel, housekeeping, catering and hospitality, hairdressing and beauty treatments, animal care grooming and training, companionship and other services of a personal nature.

Transport

Transport workers include those working in storage or logistic services.

8 . Data sources and quality

Our Coronavirus Infection Survey (CIS) methodology article provides further information around the survey design and how we process data.

More information on the strengths and limitations of the data, data uses and users is available in our Coronavirus (COVID-19) Infection Survey QMI and our Coronavirus (COVID-19) Infection Survey statistical bulletin.

9 . Related links

Coronavirus (COVID-19) Infection Survey, UK
Bulletin | Updated weekly
Estimates for England, Wales, Northern Ireland and Scotland. This survey is being delivered in partnership with the University of Oxford, University of Manchester, UK Health Security Agency and Wellcome Trust.

Coronavirus (COVID-19) Infection Survey, characteristics of people testing positive for COVID-19, UK
Bulletin | Updated fortnightly
Characteristics of people testing positive for COVID-19 from the Coronavirus (COVID-19) Infection Survey, including antibody data by UK country, and region and occupation for England. Antibodies data published before 3 February 2021 are available in this series.

Coronavirus (COVID-19) Infection Survey technical article: Analysis of characteristics associated with vaccination uptake
Article | Released 15 November 2021
Analysis of populations in the UK by likelihood of being vaccinated against COVID-19 using the Coronavirus (COVID-19) Infection Survey. This survey is being delivered in partnership with University of Oxford, University of Manchester, UK Health Security Agency and Wellcome Trust.

Coronavirus (COVID-19) Infection Survey technical article: Impact of vaccination on testing positive in the UK: October 2021
Article | Released 18 October 2021
The reduction in risk of testing positive for COVID-19 associated with vaccination overall and by different vaccine types using data from the Coronavirus (COVID-19) Infection Survey. Two time periods were analysed; when the Alpha variant was dominant in the UK (1 December 2020 to 16 May 2021), and when the Delta variant was dominant (17 May to 14 August 2021).

Coronavirus (COVID-19) Infection Survey QMI
Methodology | Released 16 July 2021
Quality and Methodology Information for the Coronavirus (COVID-19) Infection Survey (CIS), detailing the strengths and limitations of the data, methods used, and data and users.