

Article

# Coronavirus (COVID-19) Infection Survey, antibody and vaccination data for the UK: 13 May 2021

Antibody and vaccination data by UK country and regions in England from the Coronavirus (COVID-19) Infection Survey. This survey is being delivered in partnership with University of Oxford, University of Manchester, Public Health England and Wellcome Trust.

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# 1 . Main points

- In England, an estimated 7 in 10 adults or 69.3% of the adult population (95% credible interval: 65.6% to 73.9%) would have tested positive for antibodies against the coronavirus – SARS-CoV-2 – on a blood test in the week beginning 19 April 2021, suggesting they had the infection in the past or have been vaccinated.
- In Wales, an estimated 6 in 10 adults, or 63.2% of the adult population (95% credible interval: 58.8% to 68.3%) would have tested positive for antibodies against SARS-CoV-2 on a blood test in the week beginning 19 April 2021, suggesting they had the infection in the past or have been vaccinated.
- In Northern Ireland, an estimated 6 in 10 adults, or 63.5% of the adult population (95% credible interval: 57.6% to 71.2%) would have tested positive for antibodies against SARS-CoV-2 on a blood test in the week beginning 19 April 2021, suggesting they had the infection in the past or have been vaccinated.
- In Scotland, an estimated 6 in 10 adults, or 59.2% of the adult population (95% credible interval: 54.8% to 64.4%) would have tested positive for antibodies against SARS-CoV-2 on a blood test in the week beginning 19 April 2021, suggesting they had the infection in the past or have been vaccinated.
- Across all four countries of the UK, there is a clear pattern between vaccination and testing positive for COVID-19 antibodies but the detection of antibodies alone is not a precise measure of the immunity protection given by vaccination.

## 2 . Overview

In this article, we refer to the following:

Antibodies – we measure the presence of antibodies in the community population to understand who has had the 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. 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.

Community population – in this instance community population refers to private residential households, and excludes those in hospitals, care homes and/or other institutional settings.

SARS-CoV-2 – this is the scientific name given to the specific virus that causes COVID-19.

It is not yet known how having detectable antibodies, now or at some time in the past, affects the chance of getting COVID-19 again 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, as an immune response does not rely on the presence of antibodies alone. We also do not yet know exactly how much antibodies need to rise to give protection. [A person's T cell response will provide protection](#) but 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. Additional information on the link between antibodies and immunity and the [vaccine programme](#) can be found in our [latest blog](#).

This article presents analysis on past infection and/or vaccination – which we define as testing positive for antibodies to SARS-CoV-2 – for England, Wales, Northern Ireland and Scotland based on findings from the Coronavirus (COVID-19) Infection Survey in the UK. We have also included estimates from our survey on the proportion of people who reported they have received at least one dose of a vaccine against SARS-CoV-2, as well as those who have been fully vaccinated against SARS-CoV-2.

While the daily [official government figures](#) provide the recorded actual numbers of vaccines against SARS-CoV-2 issued, our vaccination estimates are likely to be different from the official figures. This is because they are estimates based on a sample survey of reported vaccine status and are provided for context alongside our antibodies estimates. Importantly, our 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 our estimates of vaccines alongside our 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) because of differences in reporting dates and the inclusion of National Immunisation Management System (NIMS)<sup>1</sup> data for England. This should be taken into consideration if comparing vaccine estimates across the four nations. In addition, as our analysis develops, our survey-based estimates will enable possible future analysis of people who have received a vaccine with other characteristics collected in the survey. Our recently published blog provides more information on [what the Office for National Statistics \(ONS\) can tell you about the COVID-19 vaccine programme](#).

Our [methodology article](#) provides further information around the survey design, how we process data, and how data are analysed. The [study protocol](#) specifies the research for the study. Further information on what the analysis covers is provided at the start of each section.

## About this analysis

The analysis on antibodies in this article is based on blood test results taken from a randomly selected subsample of individuals aged 16 years and over, which are used to test for antibodies against SARS-CoV-2.

Antibody estimates are based on a model where England, Wales and Scotland are included together in a spatial-temporal model; Northern Ireland is modelled separately. This reflects the geography of the four countries as Northern Ireland does not share a land border with Great Britain; the geo-spatial model incorporates physical land distance between regions.

This modelling approach means we are able to provide weekly estimates while adjusting to make the estimates representative of the population. The data are modelled on standardised Monday to Sunday surveillance weeks and we present data beginning 7 December 2020. Further information on our method to model antibodies can be found in our [methods article](#).

We also present data on 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.

The estimates of the percentage of people vaccinated are based on modelling of the people visited in the Coronavirus (COVID-19) Infection Survey in the community. These estimates are then adjusted (post-stratified) using population estimates to be representative (in the same way as for the antibody analysis).

We are presenting weekly modelled antibody estimates by country, grouped age, single year of age, sex, and grouped age and sex, for England, Wales, Northern Ireland and Scotland, as well as by regions in England. In Sections 3, 4, 5 and 7, we report on modelled antibodies estimates for the most recent time period available, which is the week beginning 19 April 2021<sup>2</sup>. Modelled antibody estimates for previous weeks can be found in the [accompanying dataset](#).

We are presenting trends in weekly modelled vaccination estimates for adults who reported they have received one or more doses of a COVID-19 vaccine, and adults who report they are fully vaccinated, by country, grouped age, sex, and grouped age and sex for England, Wales, Northern Ireland and Scotland, as well as by regions in England. In Sections 3, 4, 5 and 7, we report on modelled vaccination estimates for the same week as we report for antibodies estimates, which is the week beginning 19 April 2021. Modelled vaccination estimates for previous weeks can be found in the [accompanying dataset](#).

These modelled estimates are produced to provide context alongside our antibodies estimates and do not replace the [official government figures on vaccines](#), which are a more precise count of total vaccines issued. While we would expect the overall trend of our 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).

#### More about coronavirus

- Find the latest on [coronavirus \(COVID-19\) in the UK](#).
- [Explore the latest coronavirus data](#) from the ONS and other sources.
- All ONS analysis, summarised in our [coronavirus roundup](#).
- View [all coronavirus data](#).
- Find out how we are [working safely in our studies and surveys](#).

#### Notes for: Overview

1. National Immunisation Management System (NIMS) administrative data are used to validate Coronavirus (COVID-19) Infection Survey self-reported records of vaccination for England. The equivalent of this is currently not included for other countries meaning the estimates for Wales, Northern Ireland and Scotland are produced only from Coronavirus (COVID-19) Infection Survey self-reported records of vaccination.
2. We produce weekly modelled estimates 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 week, depending on the availability of test results. The antibody estimate for the most recent week in this publication includes data from 19 to 22 April 2021.

### 3 . Percentage of adults testing positive for COVID-19 antibodies and percentage of adults vaccinated against COVID-19 in England, Wales, Northern Ireland and Scotland

Our survey shows that in the week beginning 19 April 2021<sup>1</sup>:

- in England, an estimated 69.3% (95% credible interval: 65.6% to 73.9%) of the adult population would have tested positive for antibodies to SARS-CoV-2 from a blood sample
- in Wales, an estimated 63.2% (95% credible interval: 58.8% to 68.3%) of the adult population would have tested positive for antibodies to SARS-CoV-2 from a blood sample
- in Northern Ireland, an estimated 63.5% (95% credible interval: 57.6% to 71.2%) of the adult population would have tested positive for antibodies to SARS-CoV-2 from a blood sample
- in Scotland, an estimated 59.2% (95% credible interval: 54.8% to 64.4%) of the adult population would have tested positive for antibodies to SARS-CoV-2 from a blood sample

In the same week, our estimates suggest the percentage of adults who reported they had received at least one dose of a coronavirus (COVID-19) vaccine continued to increase – estimates ranged from 61.9% to 73.0% of adults across the UK. The estimated percentage of adults who are fully vaccinated against COVID-19 varied between 23.8% to 35.3% of adults across the UK in the week beginning 19 April 2021. These vaccination estimates for the community population will differ from official figures.

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

## **Figure 1: The percentage of adults testing positive for COVID-19 antibodies and the percentage of adults who reported being vaccinated in England, Wales, Northern Ireland and Scotland**

**Modelled percentage of: adults testing positive for antibodies to SARS-CoV-2, 7 December 2020 to 22 April 2021; adults who have received one or more doses of a COVID-19 vaccination; and fully vaccinated adults, 14 December 2020 to 25 April 2021, UK country**

### **Notes:**

1. All results are provisional and subject to revision.
2. These statistics refer to antibody tests and vaccinations in individuals living in the community, by which we mean 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 post-stratified by the mid-year population estimate.
5. Vaccination data for Northern Ireland starts later than the other countries, from 21 December 2021.
6. Our estimates of vaccination are provided for context alongside our antibodies estimates, but are likely to be different from the [official figures](#). The daily official government figures provide the recorded actual numbers of vaccines against SARS-CoV-2 issued.

[Download the data](#)

## **Notes for: Percentage of adults testing positive for COVID-19 antibodies and percentage of adults vaccinated against COVID-19 in England, Wales, Northern Ireland and Scotland**

1. We produce weekly modelled estimates 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 week, depending on the availability of test results. The antibody estimate for the most recent week in this publication includes data from 19 to 22 April 2021.

## 4 . Percentage of adults testing positive for COVID-19 antibodies and percentage of adults vaccinated against COVID-19 by regions in England

Antibody positivity was similar across regions in the week beginning 19 April 2021<sup>1</sup>, with estimates ranging from 64.8% in the South West to 69.7% in the North West.

The estimated percentage of adults who have received one or more doses of a coronavirus (COVID-19) vaccine continued to increase in the week beginning 19 April 2021, with estimates ranging from 59.7% in London to 71.5% in the East of England.

The estimated percentage of adults who are fully vaccinated was lowest in London at 26.3% and highest in the North West at 31.1% in the week beginning 19 April 2021. Regional antibody positivity levels are a result of regional COVID-19 infection rates and regional vaccination rollout and uptake.

### Figure 2: COVID-19 antibody positivity and the estimated percentage of adults who have been vaccinated varied across regions in England

Modelled percentages of: adults testing positive for antibodies to SARS-CoV-2, 7 December 2020 to 22 April 2021; adults who have received one or more doses of a COVID-19 vaccine; and fully vaccinated adults, 14 December 2020 to 25 April 2021, regions in England

#### Notes:

1. All results are provisional and subject to revision.
2. These statistics refer to antibody tests and vaccinations in individuals living in the community, by which we mean 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 post-stratified by the mid-year population estimate.
5. Our estimates of vaccination are provided for context alongside our antibodies estimates, but are likely to be different from the [official figures](#). The daily official government figures provide the recorded actual numbers of vaccines against SARS-CoV-2 issued.

[Download the data](#)

**Notes for: Percentage of adults testing positive for COVID-19 antibodies and percentage of adults vaccinated against COVID-19 by regions in England**



1. We produce weekly modelled estimates 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 week, depending on the availability of test results. The antibody estimate for the most recent week in this publication includes data from 19 to 22 April 2021.

## 5 . Percentage of adults testing positive for COVID-19 antibodies and percentage of adults vaccinated against COVID-19 by grouped age in England, Wales, Northern Ireland and Scotland

Our survey shows that in the week beginning 19 April 2021<sup>1</sup>:

- in England, the percentage of adults aged 16 to 49 years testing positive for antibodies ranged from 46.2% to 53.4%; in those aged 50 to 64 years, from 82.9% to 86.2%; in those aged 65 years and over, from 81.8% to 92.3%; the highest percentage of people testing positive for antibodies was in those aged 80 years and over at 92.3% (95% credible interval: 87.4% to 95.1%)
- in Wales, the percentage of adults aged 16 to 49 years testing positive for antibodies ranged from 38.1% to 47.5%; in those aged 50 to 64 years, from 81.4% to 81.7%; in those aged 65 years and over, from 81.0% to 90.4%; the highest percentage of people testing positive for antibodies was in those aged 80 years and over at 90.4% (95% credible interval: 84.3% to 93.9%)
- in Northern Ireland, the percentage of adults aged 16 to 49 years testing positive for antibodies ranged from 29.0% to 48.5%; in those aged 50 to 69 years it was 83.7% (95% credible interval: 72.1% to 91.9%); and those aged 70 years and over, 83.4% (95% credible interval: 70.3% to 92.1%) would have tested positive for antibodies (because of small sample sizes, this analysis uses different age groups to antibody analysis to England, Wales and Scotland, with everyone over the age of 70 years included in the same age group)
- in Scotland, the percentage of adults aged 16 to 49 years testing positive for antibodies ranged from 32.0% to 43.5%; in those aged 50 to 64 years, from 77.9% to 79.2%; in those aged 65 years and over, from 81.3% to 88.2%; the highest percentage of people testing positive for antibodies was in those aged 80 years and over at 88.2% (95% credible interval: 81.2% to 92.5%)

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; this reflects the age prioritisation in vaccination programmes in place across the UK. The percentage of adults who have received at least one dose of a coronavirus (COVID-19) vaccine is lowest in the younger age groups but is increasing.

Based on our estimates, more than 99% of people aged 70 years and over have received at least one dose of a COVID-19 vaccine across the UK. Of those who have been fully vaccinated, the highest percentages are found in the oldest age groups and lowest among the younger age groups. The trend in the estimated percentage of adults in the community population who are fully vaccinated varies between the four countries of the UK. This is different to the [official figures](#) for the entire UK population.

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 is seen in those in their 70s at the end of March and can now be seen among those in their 60s. Additionally, in England, the number of first vaccinations administered was lower in April than in previous months, which may explain why the overall levels of antibody positivity has remained unchanged in recent weeks.

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. This survey does not include people who live in care homes, one of the priority groups identified by the [Joint Committee on Vaccination and Immunisation \(JCVI\)](#). Daily and weekly counts of vaccine doses administered by nation can be seen in the [Public Health England \(PHE\) dashboard](#).

Modelled antibody estimates and modelled vaccine estimates relate to the adult community population (aged 16 years and over) who live in private households and does not include establishments such as care homes. The true figure among the older age groups in the population may be different. In England, an estimated [90% of people aged 80 years and over live in private households](#) and 10% live in other establishments such as care homes.

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

### **Figure 3: Percentage of adults testing positive for COVID-19 antibodies and percentage of adults who have been vaccinated by grouped age in England, Wales, Northern Ireland and Scotland**

**Modelled percentage of: adults testing positive for antibodies to SARS-CoV-2, 7 December 2020 to 22 April 2021; adults who have received one or more doses of a COVID-19 vaccine; and fully vaccinated adults, 14 December to 25 April 2021, by grouped age, UK**

#### **Notes:**

1. All results are provisional and subject to revision.
2. These statistics refer to antibody tests and vaccinations reported in the community, by which we mean private households. These figures exclude individuals in hospitals, care homes and/or other institutional settings.
3. In Northern Ireland, the number of people sampled who tested positive for antibodies to SARS-CoV-2 or reported receiving a COVID-19 vaccination is low compared with England, Wales and Scotland; therefore, people aged 50 to 69 years are included in the same age group, and those aged 70 years and over are included in the same age group.
4. 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.
5. The denominators used for vaccinations are the total people in the sample at that particular time point, then post-stratified by the mid-year population estimate.
6. Our estimates of vaccination are provided for context alongside our antibodies estimates, but are likely to be different from the [official figures](#). The daily official government figures provide the recorded actual numbers of vaccines against SARS-CoV-2 issued.

[Download the data](#)

**Notes for: Percentage of adults testing positive for COVID-19 antibodies and percentage of adults vaccinated against COVID-19 by age in England, Wales, Northern Ireland and Scotland**



1. We produce weekly modelled estimates 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 week, depending on the availability of test results. The antibody estimate for the most recent week in this publication includes data from 19 to 22 April 2021.

## 6 . Percentage of adults testing positive for COVID-19 antibodies by single year of age in England, Wales, Northern Ireland and Scotland

The analysis in this section presents modelled daily estimates of antibody positivity by single year of age for England, Wales, Scotland and Northern Ireland separately, between 26 February and 22 April 2021. The modelled data in this section are produced using a different method to the weekly modelled estimates presented in [Section 5](#) and so cannot be compared. Each data point represents a modelled estimate of antibody positivity for a particular day.

Figure 4 shows a decrease in the estimated percentage of adults testing positive for antibodies in the older ages in early to mid March 2021. Antibody positivity has since risen again in the older ages. This is likely to reflect the increase in individuals receiving the second dose of a COVID-19 vaccine.

### Figure 4: The percentages testing positive for COVID-19 antibodies by single year of age in England, Wales, Northern Ireland and Scotland

Modelled percentage of adults testing positive for antibodies to SARS-CoV-2, by single year of age, 26 February to 22 April 2021, UK

#### Notes:

1. All results are provisional and subject to revision.
2. These statistics refer to antibody tests reported in the community, by which we mean private households. These figures exclude individuals in hospitals, care homes and/or other institutional settings.
3. The method used to generate the data differs from the modelled weekly estimates of antibody positivity by age and so is not comparable.

[Download the data](#)

It is unclear if decreasing levels of antibodies means that protection is decreasing. Further work to understand this is being undertaken.

## 7 . Percentage of adults testing positive for COVID-19 antibodies and percentage of adults vaccinated against COVID-19 by sex in England, Wales, Northern Ireland and Scotland

The analysis in this section presents modelled weekly estimates of antibody positivity and vaccination by sex, and by age and sex for England, Wales, Scotland and Northern Ireland. The modelled data in this section were produced using the same modelling method as in [Section 3](#), [Section 4](#) and [Section 5](#). We have provided weekly antibody positivity estimates covering the time period 8 March to 22 April 2021, and vaccination estimates for 15 March to 25 April 2021.

Modelled estimates of antibody positivity and vaccination by sex are presented in Figure 5. Both these and modelled estimates of antibody positivity and vaccination by age and sex are available in the [accompanying dataset](#).

The percentage of adults who would have tested positive for antibodies to SARS-CoV-2 from a blood sample were broadly similar for males and females across all four UK countries, with slightly more females testing positive than males in England, Wales and Scotland.

The estimated percentage of adults who reported they have received one or more doses of a coronavirus (COVID-19) vaccine and the estimated percentage who reported they are fully vaccinated was higher for females than males between 15 March and 25 April 2021 in England, Wales and Scotland. Vaccination estimates were similar for males and females in Northern Ireland.

Across all UK countries, when broken down by age group, the same trends were observed for antibody positivity for males and females, regardless of age. The trend in the estimated percentage of adults who have received one or more doses of a vaccine remained the same in younger age groups, with more females reporting having the vaccine than males, but the percentage was similar for male and females in older age groups. The estimated percentage of adults who reported they are fully vaccinated was higher for females than males in majority of age groups, but estimates were similar in the oldest age groups across all four countries. This is likely to reflect the vaccination programmes across the UK with older ages being prioritised for first and second doses.

### **Figure 5: Percentage of adults testing positive for COVID-19 antibodies and percentage of adults who have been vaccinated by sex in England, Wales, Northern Ireland and Scotland**

**Modelled percentage of: adults testing positive for antibodies to SARS-CoV-2, 8 March to 22 April 2021; adults who have received one or more doses of a COVID-19 vaccine; and fully vaccinated adults, 15 March to 25 April 2021 by sex, UK**

**Notes:**

1. All results are provisional and subject to revision.
2. These statistics refer to antibody tests and vaccinations in individuals living in the community, by which we mean 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 post-stratified by the mid-year population estimate.
5. Our estimates of vaccination are provided for context alongside our antibodies estimates, but are likely to be different from the [official figures](#). The daily official government figures provide the recorded actual numbers of vaccines against SARS-CoV-2 issued.

[Download the data](#)

## 8 . Coronavirus (COVID-19) Infection Survey data

[Coronavirus \(COVID-19\) antibody data for the UK](#)

Dataset | Released 13 May 2021

Antibody data for the UK taken from the Coronavirus (COVID-19) Infection Survey.

## 9 . Collaboration

The Coronavirus (COVID-19) Infection Survey analysis was produced by the Office for National Statistics (ONS) in partnership with the University of Oxford, the University of Manchester, Public Health England and Wellcome Trust. Of particular note are:

- Sarah Walker – University of Oxford, Nuffield Department for Medicine: Professor of Medical Statistics and Epidemiology and Study Chief Investigator
- Koen Pouwels – University of Oxford, Health Economics Research Centre, Nuffield Department of Population Health: Senior Researcher in Biostatistics and Health Economics
- Thomas House – University of Manchester, Department of Mathematics: Reader in mathematical statistics

## 10 . Glossary

## 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. Overlapping confidence intervals indicate that there may not be a true difference between two estimates.

For more information, see our [methodology page on statistical uncertainty](#).

## Credible interval

A credible interval gives an indication of the uncertainty of an estimate from data analysis. A 95% credible interval is calculated so that there is a 95% probability of the true value lying in the interval.

# 11 . Data sources and quality

More information on [measuring the data](#) and [strengths and limitations](#) of the data is available in the Coronavirus (COVID-19) Infection Survey statistical bulletin.

Our [methodology article](#) provides further information around the survey design, how we process data, and how data are analysed.

## 12 . 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 University of Oxford, University of Manchester, Public Health England and Wellcome Trust.

### [Coronavirus \(COVID-19\) Infection Survey: characteristics of people testing positive for COVID-19 in England](#)

Article | 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 and vaccination rates in people aged 70 years and over by socio-demographic characteristic, England](#)

Article | Released 29 March 2021

First dose COVID-19 vaccination rates among people aged 70 years and older who live in England, both in private households and communal establishments. Includes estimates for the population as a whole by age and sex, and for ethnic minorities, religious groups, those identified as disabled and by area deprivation.

### [COVID-19 Infection Survey: methods and further information](#)

Methods article | Updated 26 March 2021

Information on the methods used to collect and process the data, and calculate the statistics produced from the COVID-19 Infection Survey pilot.

### [COVID-19 Infection Survey \(CIS\)](#)

Article | Updated 14 May 2020

Whether you have been invited to take part, or are just curious, find out more about our COVID-19 Infection Survey and what is involved.

### [Coronavirus \(COVID-19\) roundup](#)

Web page | Updated as and when data become available

Catch up on the latest data and analysis related to the coronavirus pandemic and its impact on our economy and society.

### [Coronavirus \(COVID-19\) latest insights](#)

Interactive tool | Updated as and when data become available

Explore the latest data and trends about the coronavirus (COVID-19) pandemic from the Office for National Statistics (ONS) and other official sources.

### [Impact of vaccination on SARS-CoV-2 cases in the community: a population-based study using the UK's COVID-19 Infection Survey](#)

Academic article | 23 April 2021

Data from the Coronavirus (COVID-19) Infection Survey were used by academic partners from the University of Oxford to examine the effect that community vaccination has had on positivity by comparing the likelihood of testing positive between participants who have had at least one dose of a coronavirus (COVID-19) vaccine and those who have not been vaccinated.

### [The impact of SARS-CoV-2 vaccines on antibody responses in the general population in the United Kingdom](#)

Academic article | 23 April 2021

Data from the Coronavirus (COVID-19) Infection Survey were used by academic partners from the University of Oxford to examine the impact of SARS-CoV-2 vaccines on antibody responses in the general population in the UK.