

Statistical bulletin

Coronavirus (COVID-19) Infection Survey, antibody data, UK: 27 July 2022

Antibody data by UK country and age in England from the Coronavirus (COVID-19) Infection Survey.

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1 . Main points

In this bulletin, we report percentages of the population that are estimated to have antibodies against SARS-CoV-2, the specific virus that causes coronavirus (COVID-19), above two levels: a 179 ng/ml level and an 800 ng/ml level.

In the week beginning 27 June 2022, the percentage of people estimated to have antibodies against SARS-CoV-2:

- in England, was 97.1% of adults at or above 179 ng/ml (95% credible interval: 96.8% to 97.4%), and 74.9% of adults at or above 800 ng/ml (95% credible interval: 73.5% to 76.3%)
- in Wales, was 97.3% of adults at or above 179 ng/ml (95% credible interval: 96.7% to 97.8%), and 75.0% of adults at or above 800 ng/ml (95% credible interval: 72.6% to 77.3%)
- in Northern Ireland, was 96.0% of adults at or above 179 ng/ml (95% credible interval: 94.1% to 97.2%), and 76.4% of adults at or above 800 ng/ml (95% credible interval: 72.8% to 79.6%)
- in Scotland, was 96.8% of adults at or above 179 ng/ml (95% credible interval: 96.2% to 97.3%), and 73.1% of adults at or above 800 ng/ml (95% credible interval: 70.9% to 75.1%)
- in Great Britain, was 92.8% of children aged 12 to 15 years at or above 179 ng/ml, and 68.1% of children aged 8 to 11 years at or above 179 ng/ml

Estimates of antibodies against SARS-CoV-2 at the 800 ng/ml level are not comparable with our previously published estimates because of method changes since our 4 May 2022 publication: [Coronavirus \(COVID-19\) Infection Survey, antibody data, UK: 4 May 2022](#).

2 . Recent method and processing changes

We are continually developing our methods to estimate the percentages of the UK population with antibodies against SARS-CoV-2 above different levels and, as such, consider these as experimental statistics. These latest estimates include method developments, both from our partner laboratory and improvements to our statistical model. Continual development of these statistics is important as we learn more about the protection provided from vaccination and past infection, both against testing positive for the infection and against severe illness among those who do become infected.

To ensure our estimates of antibody positivity remain informative, our partner laboratory has implemented processing changes to measure antibody positivity at higher threshold levels. This enables us to identify higher concentrations of antibodies in the blood, with results providing a more informative view of antibody levels within the population. Additionally, one of the main purposes of our antibody positivity estimates is to allow us to observe antibody waning and when this occurs. Measuring antibody positivity at higher thresholds allows us to observe antibody waning earlier.

In addition to laboratory processing changes, we have made improvements to our statistical model to better adjust for age and ethnicity.

For further details of these changes, please refer to "Laboratory processing changes" and "Improvements to our statistical models".

Our antibody positivity estimates are subject to continuous review as the coronavirus pandemic evolves.

Laboratory processing changes

During the testing process, the laboratory dilutes the samples to measure the number of antibodies in the blood. In January 2022 and in April 2022, our partners at the Oxford laboratory increased the amount of dilution applied to samples, allowing us to estimate antibody positivity at higher levels. Implementation of this approach also required additional changes to how the laboratory physically processes samples.

After implementing this approach, an error was identified in calibrating the results across the different dilutions. This has now been corrected, and this has resulted in changes to the antibody estimates previously published. The largest impact is on results at the 800 ng/ml level after 17 January 2022, and for results at the 179 ng/ml level for children. While we have provided the latest estimates for children in this publication, further quality assurance is required for the earlier time series.

It is important to note that not all samples tested produce a conclusive result, and as part of our continuous improvement, we are now retesting the small percentage of samples where a result was not obtained. Therefore, some estimates from 2022 may change further.

In general, these developments have resulted in minimal changes to our findings. Instead, they provide improved assurance of our results.

Improvements to our statistical models

In addition to the laboratory processing changes, we have also made improvements to our statistical models used to estimate antibody positivity at both the 179 ng/ml level and 800 ng/ml level. These improvements have been implemented to better adjust for age and ethnicity in our results. This change has resulted in a reduction in the credible intervals of our estimates, particularly for Northern Ireland, providing greater precision.

Future developments

We are continually developing our antibody positivity estimates and plan to introduce further improvements in future. One of these changes is to introduce estimates of antibody positivity at levels greater than 800 ng/ml, further increasing our ability to distinguish different antibody levels within the population and observe antibody waning earlier.

Additionally, we will be making further developments to our statistical methods for estimating antibody positivity.

3 . Antibodies by age group

In the week beginning 27 June 2022, the percentage of the adult population estimated to have antibodies against SARS-CoV-2 at or above the level of 179 nanograms per millilitre (ng/ml) remained high across the UK. Among those aged 75 years and over, the percentage estimated to have antibodies against SARS-CoV-2 at or above the level of 800 ng/ml increased in recent weeks, corresponding to the rollout of fourth vaccinations for these ages.

Figure 1: The percentage of the population estimated to have antibodies against SARS-CoV-2 remained high for UK adults in the week beginning 27 June 2022

Modelled percentage of the adult population with levels of antibodies against SARS-CoV-2 at or above 179 nanograms per millilitre (ng/ml) or 800 ng/ml, by age group, UK countries, 7 December 2020 to 3 July 2022

Notes:

1. All results are provisional and subject to revision.
2. These statistics refer to antibody tests for individuals living in private households.
3. In Northern Ireland, the number of people sampled is low compared with England, Wales, and Scotland; therefore, adults 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.
5. The denominators used for antibodies are the total for each age group in the sample at that particular time point, then post-stratified by the mid-year population estimate.
6. Not all samples tested produce a conclusive result, and as part of continuous improvement, we are now retesting samples where a result was not obtained. Therefore, some estimates from 2022 may change.

Download the data

[.xlsx](#)

4 . Coronavirus (COVID-19) Infection Survey data

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

Dataset | Released 27 July 2022

Antibody data by UK country and regions in England from the Coronavirus (COVID-19) Infection Survey.

5 . Glossary

Antibodies

We measure the levels of antibodies in people who live in private households 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. Antibodies can help 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.

SARS-CoV-2

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

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.

6 . Measuring the data

Reference dates

The antibody positivity estimates for the most recent week in this publication include data from 27 June to 3 July 2022.

Our [Coronavirus \(COVID-19\) Infection Survey: methodology article](#) provides further information around the survey design, how we process data, and how data are analysed. Our [Quality and Methodology Information](#) explains the strengths and limitations of the data, methods used, and data uses and users.

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

Survey data

The analysis on antibodies in this bulletin is based on blood test results taken from a randomly selected subsample of individuals aged 8 years and over who live in private households. The survey excludes those in hospitals, care homes and other communal establishments. The blood samples are used to test for antibodies against SARS-CoV-2.

Antibodies and immunity

Antibody positivity is defined by having a fixed concentration of antibodies in the blood. A negative test result occurs if there are no antibodies, or if antibody levels are too low to reach a level at the time of testing. It does not mean that their antibody level is at zero or that a person has no protection against COVID-19. Additionally, there are other parts of the immune system that will offer protection, for example, a person's T-cell response. This will not be detected by blood tests for antibodies. [A person's immune response is affected by a number of factors](#), including health conditions and age.

Our [blog on antibodies and immunity](#) gives further information on the link between antibodies and immunity and the vaccine programme. Our [blog on vaccine effectiveness](#) provides information on the effectiveness of vaccinations against Alpha and Delta variants, which is based on research conducted by partners from the University of Oxford.

Measuring antibody positivity

Our 179 nanograms per millilitre (ng/ml) [level is based on research by our academic partners](#), and reflects the percentage of adults who would have been likely to have a strong enough antibody response to provide some protection from getting a new COVID-19 infection with the Delta variant. This level is higher than our previously reported standard level of 42 ng/ml, which was associated with SARS-CoV-2 infection before vaccines became available. Antibody levels below this 179 ng/ml level do not mean that a person has no antibodies or immune protection at all. This antibody level was identified as providing a 67% lower risk of getting a new COVID-19 infection with the Delta variant after two vaccinations with either Pfizer or AstraZeneca vaccines, compared with someone who was unvaccinated and had not had COVID-19 before. It is unlikely that this level will provide equivalent protection against the Omicron variant, and we will keep the level used in our analysis of antibodies under regular review. The 800 ng/ml level is the highest level at which we can produce a historic back-series, and it is provided to enable enhanced monitoring of antibody levels and waning. It is not based on academic research on protection against Omicron, as sufficient evidence on this is not yet available.

The [test used for spike antibodies measures](#) their concentration in ng/ml. The antibody level of 179 ng/ml corresponds to 100 binding antibody units (BAU)/ml, using the World Health Organization's (WHO) standardised units (enabling comparison across different antibody assays).

Further information on antibody test levels, and the link between antibodies and infections can be found in our recent [blog post: Relationship between COVID-19 infections and antibodies: What do the data show?](#)

7 . 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: Characteristics associated with third vaccination uptake: 21 April 2022](#)

Technical article | Released 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.

[Coronavirus \(COVID-19\) Infection Survey technical article: Cumulative incidence of the number of people who have tested positive for COVID-19, UK: 22 April 2022](#)

Technical article | Released 22 April 2022

Analysis of the number of people in the UK who have tested positive for 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](#)

Technical 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 | Last revised 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 uses and users.