

Statistical bulletin

COVID-19 Schools Infection Survey, England: pupil antibody data, January to February 2022

Estimates of pupils testing positive for SARS-CoV-2 antibodies from the COVID-19 Schools Infection Survey (SIS) based on a sample of schools in England. SIS is jointly led by the London School of Hygiene and Tropical Medicine, UK Health Security Agency and the Office for National Statistics.

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1 . Main points

- An estimated 96.6% of secondary school pupils and 62.4% of primary school pupils had coronavirus (COVID-19) SARS-CoV-2 antibody levels above the limit of detection in January to February 2022, after adjusting for sensitivity and specificity.
- Antibody prevalence was significantly higher in Round 2 (January to February) than Round 1 (November to December) of the Schools Infection Survey (SIS) for both primary and secondary school pupils.
- SARS-CoV-2 antibody prevalence continues to steadily increase by age for all pupils.
- Over half of pupils aged four to seven years tested positive for SARS-CoV-2 antibodies.

Have you been asked to take part in the study?

For more information, please visit the SIS participant [guidance page](#).

If you have any further questions, please email the SIS operations team: Schools.Studies.Mailbox@ons.gov.uk.

2 . Pupils testing positive for coronavirus (COVID-19) antibodies

Results presented are from Round 2 (10 January to 3 February) of the Schools Infection Survey (SIS) during the academic year ending August 2022. The pupil antibody test used in SIS is based on oral fluid collection because this is a non-invasive alternative to collecting blood. However, this test has a lower sensitivity (estimated at 80%) for unvaccinated pupils. To account for this, results from unvaccinated pupils were adjusted for the sensitivity and specificity of the antibody tests. For more information on the adjustments, please see the [Glossary section](#).

The unadjusted percent of pupils testing positive for SARS-CoV-2 antibodies was 50.3% in primary school pupils (95% confidence intervals: 47.9% to 52.7%) and 86.8% in secondary school pupils (95% confidence intervals: 84.3% to 89.1%).

Pupils were tested for both anti-N (antibodies from natural infection) and anti-S (antibodies from natural infection or vaccination) SARS-CoV-2 antibodies. Further information about the antibody tests used can be found in [our COVID-19 Schools Infection Survey, 2021 to 2022: methods and further information article](#).

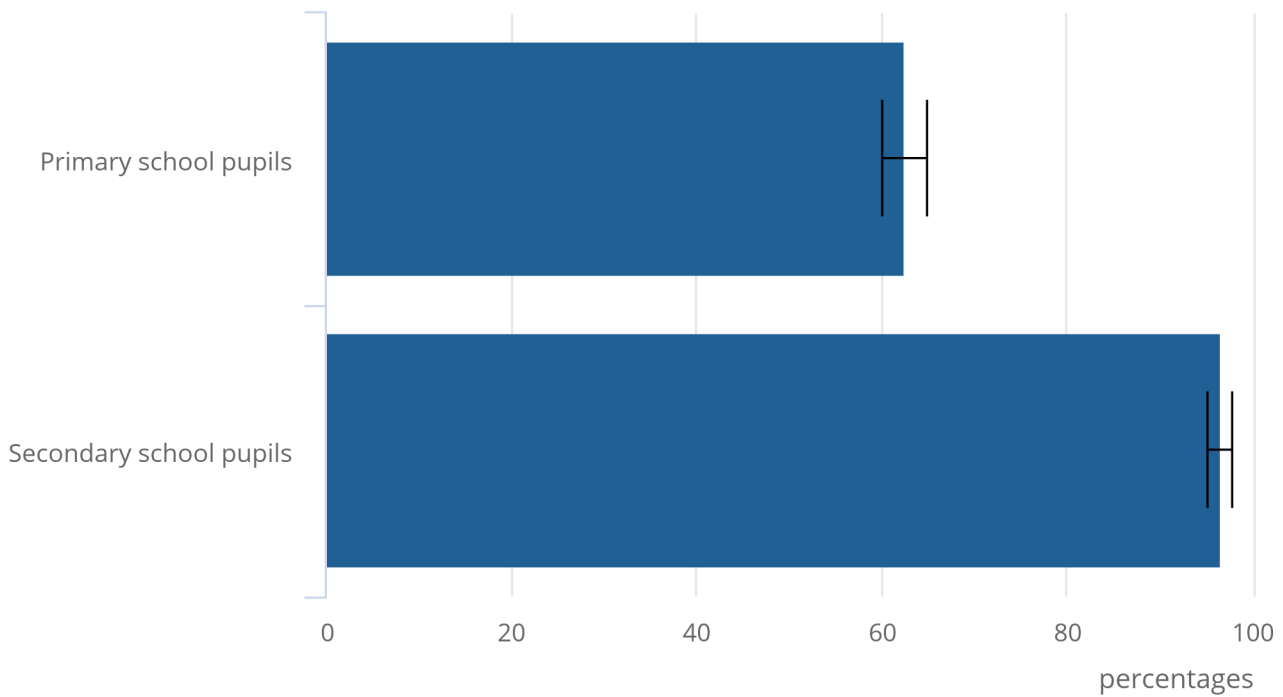
Figure 1 shows the percentage of pupils with SARS-CoV-2 antibody levels above the limit of detection in schools sampled. After adjusting for the sensitivity and specificity of the SARS-CoV-2 antibody tests and the vaccination status of pupils tested, we estimate that 62.4% of primary school pupils (95% confidence intervals: 60.0% to 64.7%) and 96.6% of secondary school pupils (95% confidence intervals: 95.1% to 97.8%) had SARS-CoV-2 antibody levels above the limit of detection.

Figure 1: More secondary school pupils than primary school pupils tested positive for antibodies to COVID-19

Adjusted percentage of pupils testing positive for antibodies to COVID-19, England, January to February 2022

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Adjusted percentage of pupils testing positive for antibodies to COVID-19, England, January to February 2022



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

Notes:

1. Figures have been adjusted to account for the sensitivity and specificity of the antibody tests for unvaccinated pupils.

Comparisons between Round 1 and Round 2

The percentage of pupils testing positive for SARS-CoV-2 antibodies increased significantly for both primary school and secondary school pupils between Round 1 (10 November to 10 December) and Round 2, as shown in Figure 2.

In Round 1, 40.1% of primary school pupils (95% confidence intervals: 37.3% to 43.0%) had SARS-CoV-2 antibody levels above the limit of detection, after adjusting for sensitivity and specificity. For secondary school pupils, 82.4% (95% confidence intervals: 79.5% to 85.1%) had SARS-CoV-2 antibody levels above the limit of detection.

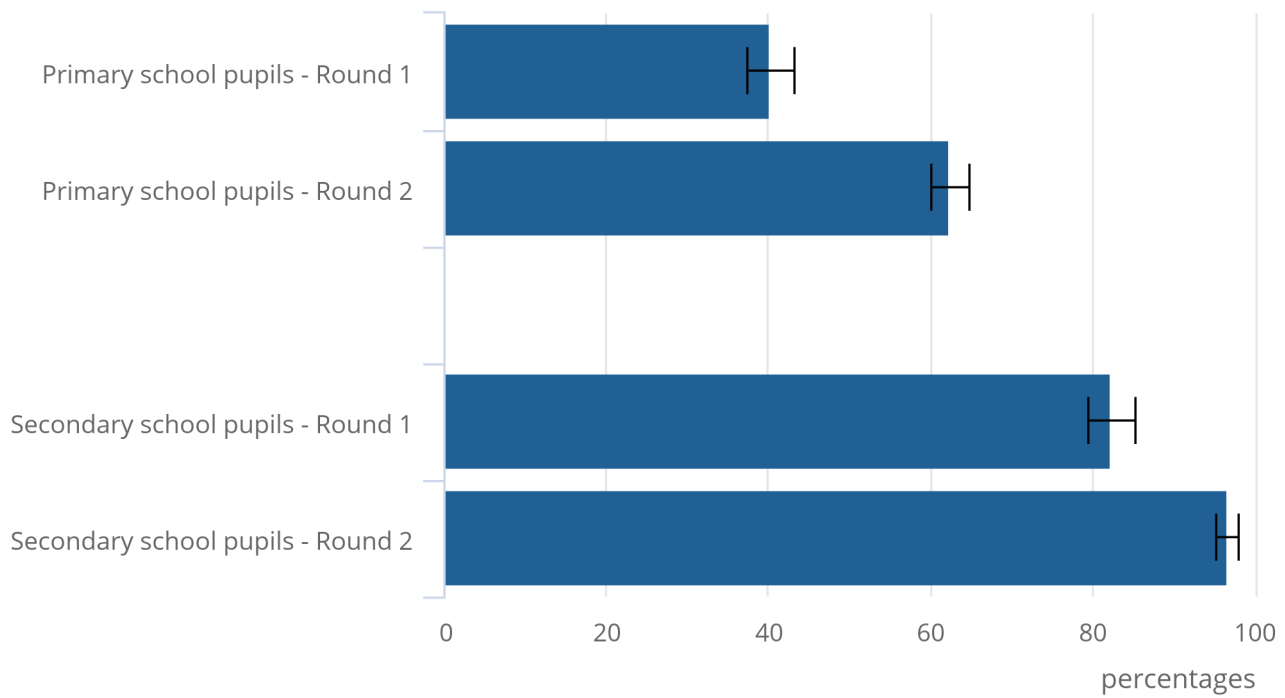
Antibody testing in Round 2 took place while COVID-19 cases in England were increasing because of the Omicron variant (declared a variant of concern on 27 November 2021), especially among school children. It is likely that antibody prevalence was higher in Round 2 than Round 1 because of an increase in infections in the community and the continuing vaccination programme for secondary school pupils.

Figure 2: More pupils tested positive for antibodies to COVID-19 in Round 2 than Round 1

Adjusted percentage of pupils testing positive for antibodies to COVID-19 in Round 1 and Round 2, England, November 2021 to February 2022

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Adjusted percentage of pupils testing positive for antibodies to COVID-19 in Round 1 and Round 2, England, November 2021 to February 2022



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

Notes:

1. Figures have been adjusted to account for the sensitivity and specificity of the antibody tests for unvaccinated pupils.

Antibody estimates by vaccination status

Pupil vaccination data were obtained by linking to the National Immunisation Management System (NIMS). Pupils were defined as vaccinated if they had their first dose at least 14 days before their antibody test.

Of secondary school pupils tested in Round 2, 46.6% had received at least one vaccination dose at least 14 days before their antibody test. No primary school pupils tested in Round 2 were vaccinated. Based on adjusted figures, 97.4% (95% confidence intervals: 96.1% to 98.4%) of vaccinated secondary school pupils had SARS-CoV-2 antibodies and 97.0% (95% confidence intervals: 95.5% to 98.1%) of unvaccinated secondary school pupils had SARS-CoV-2 antibodies.

Figure 3 shows the percentage of pupils that tested positive for SARS-CoV-2 antibodies by their vaccination status. At the time of antibody testing in Round 2, most secondary school pupils (those aged 12 years and over) were eligible for a COVID-19 vaccine. Based on adjusted figures, 45.4% (95% confidence intervals: 41.9% to 48.9%) of pupils were both vaccinated and SARS-CoV-2 antibody positive and 51.2% (95% confidence intervals: 47.7% to 54.7%) were unvaccinated and antibody positive. Further analysis by vaccination status, including by region and age, can be found in [our accompanying dataset](#).

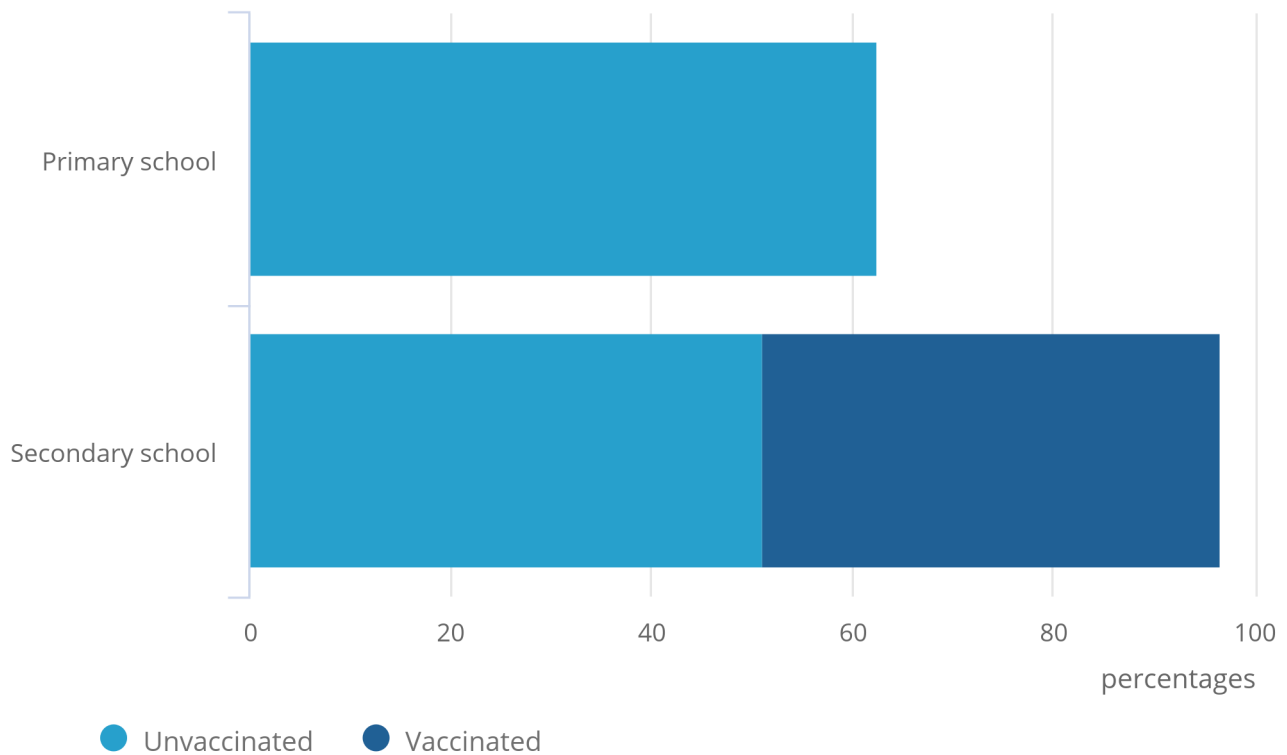
Results based on vaccination status should be treated as an indication only. Vaccinated pupils could develop antibodies through vaccination and/or natural infection, whereas unvaccinated pupils will only have antibodies following natural infection. Antibodies following natural infection could fall below levels of detection faster than antibodies following vaccination. Further information can be found in the [Strengths and limitations section](#).

Figure 3: High levels of antibody positivity among secondary school children are driven by both vaccination and natural infection

Adjusted percentage of pupils testing positive for antibodies to COVID-19 by vaccination status, England, January to February 2022

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Adjusted percentage of pupils testing positive for antibodies to COVID-19 by vaccination status, England, January to February 2022



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

Notes:

1. Figures have been adjusted to account for the sensitivity and specificity of the antibody tests for unvaccinated pupils.
2. "Vaccinated" refers to pupils who have received at least one COVID-19 vaccine dose at least 14 days before being sampled.

Regional antibody estimates

Figure 4 shows the adjusted percentage of pupils in primary and secondary schools testing positive for SARS-CoV-2 antibodies by region. The highest levels of SARS-CoV-2 antibodies in secondary school pupils were identified in London (greater than 99%, 95% confidence intervals: 95.3% to 100%) and the West Midlands (greater than 99%, 95% confidence intervals: 95.5% to 100%).

As in Round 1, the highest levels of SARS-CoV-2 antibodies for primary school pupils were identified in the West Midlands (73.6%, 95% confidence intervals: 66.8% to 79.7%). In all regions, more secondary school pupils tested positive for SARS-CoV-2 antibodies than primary school pupils. More information on breakdowns by region, including unadjusted figures, is available in [our accompanying dataset](#).

Figure 4: The highest proportion of secondary pupils testing positive for antibodies to COVID-19 were in London and the West Midlands

Adjusted percentage of pupils testing positive for antibodies to COVID-19 by region, England, January to February 2022

Notes:

1. Figures have been adjusted to account for the sensitivity and specificity of the antibody tests for unvaccinated pupils.
2. After adjustment, estimates for some regions are greater than 99%.

Download this chart

[.xlsx](#)

Antibody estimates by age

Figure 5 shows the adjusted percentage of pupils testing positive for SARS-CoV-2 antibodies by age. The proportion of primary school pupils (those aged 4 to 10 years) testing positive for antibodies steadily increased by age.

Among secondary school pupils, nearly all pupils aged between 12 and 15 years tested positive for SARS-CoV-2 antibodies. Pupils aged 12 years and over were eligible for a COVID-19 vaccine at the time of testing. More information on breakdowns by age for pupils aged 4 to 16 years, including unadjusted figures, is available in [our accompanying dataset](#).

Over a half of pupils aged four to seven years (54.9%, 95% confidence intervals: 51.4% to 58.4%) tested positive for antibodies. This is a statistically significant increase from Round 1 (33.9%, 95% confidence intervals: 30.1% to 37.9%).

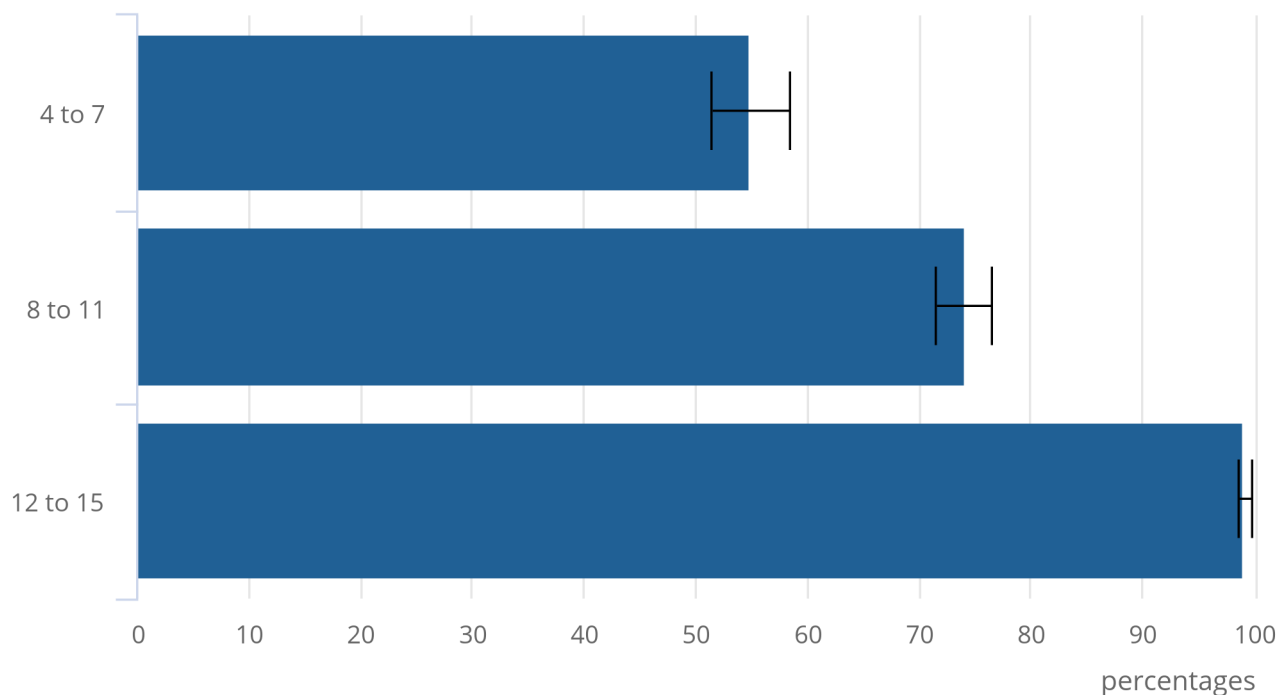
In [our Coronavirus \(COVID-19\) Infection Survey, antibody data, UK bulletin](#), we also produce antibody estimates for pupils aged 8 to 11 years and aged 12 to 15 years. Further information can be found in the [Measuring the data section](#).

Figure 5: The percentage of pupils testing positive for antibodies to COVID-19 increased by age group

Adjusted percentage of pupils testing positive for antibodies to COVID-19 by age group, England, January to February 2022

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Adjusted percentage of pupils testing positive for antibodies to COVID-19 by age group, England, January to February 2022



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

Notes:

1. Figures have been adjusted to account for the sensitivity and specificity of the antibody tests for unvaccinated pupils.
2. After adjustment, estimates for pupils aged 12 to 15 years are greater than 99%.
3. Age is calculated using the pupil's date of birth as of 31 August 2021.

More about coronavirus

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

3 . COVID-19 Schools Infection Survey, questionnaire and antibody data

[COVID-19 Schools Infection Survey, antibody data, England \(January to February 2022\)](#)

Dataset | Released 1 April 2022

Initial estimates of pupils testing positive for SARS-CoV-2 antibodies from the COVID-19 Schools Infection Survey across a sample of schools. The Schools Infection Survey (SIS) is jointly led by the London School of Hygiene and Tropical Medicine, UK Health Security Agency, and the Office for National Statistics (ONS).

4 . Collaboration

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UK Health
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Agency

The Coronavirus (COVID-19) Schools Infection Survey (SIS) analysis was produced by the Office for National Statistics (ONS) in collaboration with our research partners at the London School of Hygiene and Tropical Medicine (LSHTM) and UK Health Security Agency (UKHSA). Of note are:

- Shamez Ladhani, Consultant Epidemiologist and Study Chief Investigator at UKHSA
- Georgina Ireland, Senior Scientist at UKHSA
- Punam Mangtani, Professor of Infectious Disease Epidemiology and Study Co-Principal Investigator at LSHTM
- Patrick Nguipdop-Djomo, Associate Professor of Infectious Disease Epidemiology and Study Co-Principal Investigator at LSHTM

5 . Glossary

Adjustment method

To account for the sensitivity and specificity of the oral fluid antibody test used, we apply an adjustment to results from unvaccinated pupils. Adjusted estimates are a more reliable indication of SARS-CoV-2 antibody positivity because unadjusted estimates underestimate the prevalence of SARS-CoV-2 antibodies in unvaccinated pupils when using oral fluid antibody tests. Adjustment for test accuracy is not necessary for vaccinated pupils. The test used is assumed to have 80% sensitivity and 99% specificity. For more information please see our [COVID-19 Schools Infection Survey, 2021 to 2022: methods and further information article](#).

Antibody positivity

Antibody positivity is defined by having a fixed concentration of antibodies. A negative test result occurs if there are no antibodies, or if antibody levels are too low to reach a threshold at the time of testing. It does not mean that a person's antibody level is at zero or that they have no protection against coronavirus (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 saliva tests for antibodies. A person's immune response is affected by factors such as health conditions and age.

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.

Statistical significance

A result is said to be statistically significant if it is likely not caused by chance or the variable nature of the samples. For more information, see [our COVID-19 Schools Infection Survey, 2021 to 2022: methods and further information article](#). We assess statistical significance using confidence intervals.

6 . Measuring the data

Data presented in this bulletin are from Round 2 of the COVID-19 Schools Infection Survey (SIS) during the academic year ending 2022. These findings are for SARS-CoV-2 antibodies for pupils only.

Estimates have been weighted and are representative of ethnicity, gender, and age.

See [our COVID-19 Schools Infection Survey, 2021 to 2022: methods and further information article](#) for further information about response rates, survey design, how we process data, and how data are analysed.

Age in this bulletin is calculated using the pupil's date of birth as of 31 August 2021.

Reference period

The results presented in this bulletin are from antibody tests conducted in schools in England between 10 January to 3 February 2022. This is referred to as Round 2.

Response rates

In Round 2, 150 schools took part in testing (106 primary and 44 secondary). Within these schools, 7,664 pupils (4,119 primary and 3,543 secondary) took part in the COVID-19 antibody test. The total estimated response rate for participation in Round 2 antibody testing was 10%. The estimated response rate for primary school pupils was 15% and secondary school pupils was 7%.

Quality

More quality and methodology information on strengths, limitations, appropriate uses, and how the data were created is available in [our COVID-19 Schools Infection Survey, 2021 to 2022: methods and further information article](#).

Data cleaning and quality assurance is being carried out on data collected as part of the study on an ongoing basis. All estimates presented in this bulletin are provisional results. Estimates may therefore be revised in future publications.

Comparisons with the Coronavirus (COVID-19) Infection Survey

In [our Coronavirus \(COVID-19\) Infection Survey](#) (CIS), we also produce antibody estimates for pupils aged 8 to 11 years and aged 12 to 15 years. The CIS estimates that from 31 January to 6 February, 96.6% of children aged 8 to 11 years (95% credible intervals: 93.9% to 98.1%, sample size: 119) and 98.0% of children aged 12 to 15 years (95% credible intervals: 96.5% to 98.8%, sample size: 278) had antibodies to COVID-19 at the standard antibody threshold.

Compared with the SIS, the CIS uses a different antibody test (finger prick blood test) to determine antibody levels. It also has important differences in methodologies, including:

- a slightly different sample population with a significantly lower sample size in this age group
- testing methods
- data collection periods

While we estimate different levels of antibody positivity, both studies record a similar level of antibodies across the populations they cover. More information is available in [our Using the COVID-19 School Infection Survey to measure the impact of the pandemic on children blog](#).

7 . Strengths and limitations

Please refer to the [Strengths and limitations section](#) of our previous COVID-19 Schools Infection Survey, England: pupil antibody data, November to December 2021.

8 . Related links

[COVID-19 Schools Infection Survey, England: mental health and long COVID, November to December 2021](#)

Bulletin | Released 28 February 2022

Analysis of COVID-19 findings on mental health and long COVID from the Schools Infection Survey's headteacher, parent and pupil questionnaires. The Schools Infection Survey is jointly led by the London School of Hygiene and Tropical Medicine, UK Health Security Agency and the Office for National Statistics.

[Coronavirus \(COVID-19\) cases in school pupils, England: up to 22 December 2021](#)

Article | Released 24 March 2022

Coronavirus (COVID-19) cases in school pupils aged 4 to 15 years attending state-funded schools. Includes detailed analysis by demographic and geographic characteristics and vaccine status. Experimental Statistics.

[Coronavirus \(COVID-19\) Infection Survey, UK: antibody data, 24 March 2022](#)

Bulletin | Released 24 March 2022

Headline results of antibody data by UK country and regions in England from the Coronavirus (COVID-19) Infection Survey. This analysis has been produced in partnership with the University of Oxford, University of Manchester, UK Health Security Agency, and Wellcome Trust. This study is jointly led by the Office for National Statistics (ONS) and the Department for Health and Social Care (DHSC) working with the University of Oxford and Lighthouse Laboratory to collect and test samples.