

Statistical bulletin

# COVID-19 Schools Infection Survey, England: Round 6, pupil antibody data, June 2021

Initial estimates of pupils testing positive for SARS-CoV-2 antibodies from the COVID-19 Schools Infection Survey across a sample of schools, within selected local authority areas in England. This 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.

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# 1 . Main points

- The pupil antibody test used in the COVID-19 Schools Infection Survey (SIS) is based on oral fluid collection as this is a non-invasive alternative to collecting blood but this test has a lower sensitivity (estimated at 80%); after adjusting for the sensitivity of the test, in Round 6 (14 June to 6 July 2021), 11.25% of primary school pupils and 12.95% of secondary school pupils in the local authorities sampled had antibody levels above the limit of detection.
- The antibody conversion rate (testing positive after having tested negative in the previous round) between rounds 4 and 6 (March to July 2021) was the lowest seen between any two consecutive testing points in SIS at 2.3 per 1,000 person-weeks for primary school pupils and 1.4 per 1,000 person weeks for secondary pupils; there was no significant difference between conversion rates of primary school pupils and secondary school pupils.
- A [technical article](#) has been released alongside this bulletin which provides further details on methods for estimating the proportion “ever testing” positive for SARS-CoV-2 antibodies over the course of SIS.

## 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](mailto:Schools.Studies.Mailbox@ons.gov.uk).

Data presented are not intended to be generally applicable to all schools in England. The study was originally designed to oversample schools in areas where infection was highest at the start of the academic year (September 2020). (See [methodology article](#).)

The antibody tests used in this study detect antibodies produced following natural infection and not vaccination.

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

The unadjusted percent of pupils, in the local authorities sampled, with SARS-CoV-2 antibody levels above the limit of detection in Round 6 (14 June to 6 July 2021) was 9.89% in primary school pupils (95% confidence intervals: 8.06% to 11.98%) compared with 11.23% in secondary school pupils (95% confidence intervals: 10.18% to 12.35%).

Figure 1 shows the percentage of pupils with SARS-CoV-2 antibody levels, in the local authorities sampled, above the limit of detection in Round 6 (14 June to 6 July 2021) after adjusting for the sensitivity and specificity of the antibody test. The estimated percentage testing positive for SARS-CoV-2 antibodies increased to 11.25% for primary pupils (95% confidence intervals: 8.93% to 13.90%) and 12.95% for secondary pupils (95% confidence intervals: 11.62% to 14.37%).

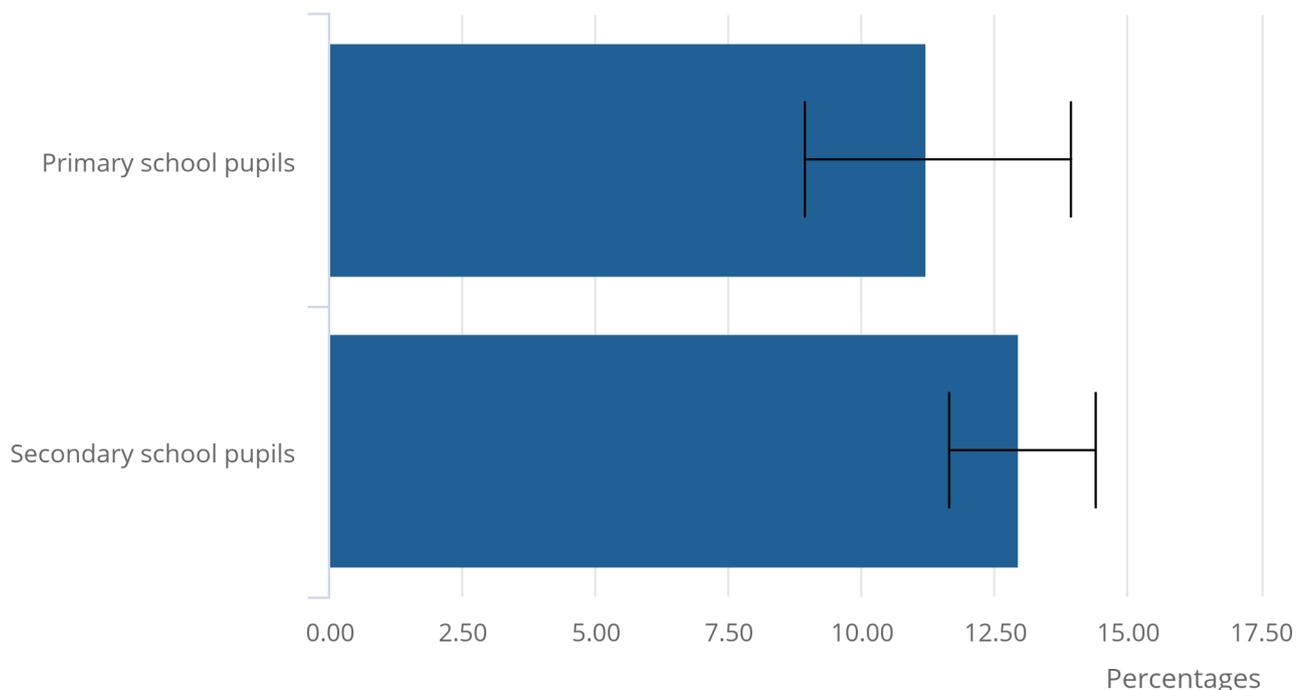
Round 6 was undertaken during the period when coronavirus (COVID-19) infection rates were increasing following the emergence of the Delta variant. However, a large proportion of these infections occurred in late June and it is unlikely that these infections would have been captured in Round 6 testing because of the delay in generating antibodies following infection.

## Figure 1: Percentage of pupils testing positive for antibodies to COVID-19

England, 14 June to 6 July 2021 (Round 6)

### Figure 1: Percentage of pupils testing positive for antibodies to COVID-19

England, 14 June to 6 July 2021 (Round 6)



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

#### Notes:

1. Data from 14 local authorities.
2. Figures have been adjusted to account for the sensitivity and specificity of the antibody test.

Antibody levels are less concentrated in oral fluid samples than in blood and may fall below the limit of detection for the oral fluid test whereas it remains present in blood for longer. Therefore, some pupils who previously tested positive for SARS-CoV-2 antibodies will test negative in later rounds.

When new infections are low, the net effect of this can lead to an apparent fall in antibody levels in the population, and in the case of SIS the percent testing positive in Round 6 is lower than that in [Round 4 \(15 to 31 March 2021\)](#). Therefore, the results cannot be used as a measure of prior COVID-19 infection over a long time period and, as the immune response does not rely on antibodies alone, those figures cannot be used as an indication of current immunity.

To provide a more comprehensive estimate of prior infection with COVID-19, the proportion “ever testing” positive for SARS-CoV-2 antibodies has been calculated and these findings can be found in this [technical article](#).

Figure 2 shows the percentage of pupils with SARS-CoV-2 antibody levels above the limit of detection in Round 6 (14 June to 6 July 2021) by local authority. Confidence intervals are wide, so all estimates should be interpreted with caution. However, they indicate a range in antibody levels around the country. Data for the proportion “ever testing” positive by local authority is also available in the accompanying [technical article](#).

## **Figure 2: Pupils testing positive for antibodies to COVID-19 by local authorities**

**England, 14 June to 6 July 2021 (Round 6)**

### **Notes:**

1. Data from 14 local authorities; Bradford is not included as data were not available for both primary and secondary schools.
2. Data for Norfolk primary schools has been suppressed due to low counts.

[Download this chart](#)

### 3 . Antibody conversion rate

In the case of the coronavirus (COVID-19), antibody conversion is defined when a positive antibody test result is recorded following a negative result in the previous testing round and will capture both symptomatic and asymptomatic infections that may have been missed between testing rounds.

To account for the different follow-up times between the rounds (on average the follow-up time between rounds 1 and 2 was three weeks, between rounds 2 and 4 was 15 weeks, and between rounds 4 and 6 was 13 weeks), the antibody conversion rate has been calculated and expressed per 1,000 person-weeks. More details on this [methodology](#) are available.

In some cases the [confidence intervals](#) around these estimates are wide because of the small number of participants who recorded antibody conversion and caution should be taken when interpreting results. When numbers are small, weighting the data can also mean that a small number of individuals have a large impact on the antibody conversion rate.

The antibody conversion rate in oral fluids has continued to decrease in rounds 4 to 6 (March to July 2021, 2.0 per 1,000 person-weeks) for all pupils combined. This compares to the highest rate which was between rounds 1 to 2 (November to December 2020, 12.0 per 1,000 person-weeks), and is also lower than the rate seen between rounds 2 to 4 (December 2020 to March 2021, 5.7 per 1,000 person-weeks).

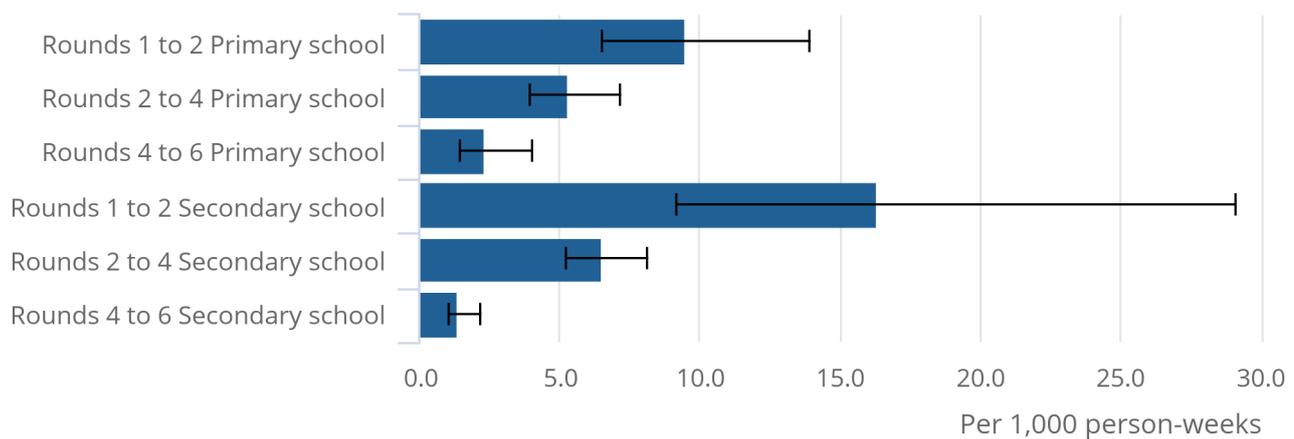
The antibody conversion rate between rounds 4 and 6 was the lowest seen between any testing rounds. There was no significant difference between antibody conversion rates of primary school pupils (2.3 per 1,000 person-weeks) and secondary school pupils (1.4 per 1,000 person-weeks) between rounds 4 and 6.

### Figure 3: Antibody conversion rate for pupils by school type, Round 1 to 2, Round 2 to 4 and Round 4 to 6

England, 3 to 20 November 2020 (Round 1), 30 November to 11 December 2020 (Round 2), 15 to 31 March 2021 (Round 4) and 14 June to 6 July 2021 (Round 6)

### Figure 3: Antibody conversion rate for pupils by school type, Round 1 to 2, Round 2 to 4 and Round 4 to 6

England, 3 to 20 November 2020 (Round 1), 30 November to 11 December 2020 (Round 2), 15 to 31 March 2021 (Round 4) and 14 June to 6 July 2021 (Round 6)



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

#### Notes:

1. For coronavirus, antibody conversion is the incidence of SARS-CoV-2 antibody test results changing from negative to positive in oral fluid.
2. Data from 11 Local Authorities (excluding Bradford, Lancashire, Norfolk, and Reading) with coverage in rounds 1, 2, 4 and 6, and at least two primary and two secondary schools in the sample. These are not necessarily the same schools or participants tested between rounds.
3. Schools were closed for most pupils from 5 January 2021 to 8 March 2021.

#### More about coronavirus

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

## 4 . COVID-19 Schools Infection Survey data

[COVID-19 Schools Infection Survey Round 6 pupil antibodies](#)

Dataset | Released 27 October 2021

Initial estimates of pupils testing positive for SARS-CoV-2 antibodies from the COVID-19 Schools Infection Survey across a sample of schools, within selected local authority areas in England.

## 5 . Collaboration

The Coronavirus (COVID-19) Schools Infection Survey 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 and UK Health Security Agency.

## 6 . 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](#).

### 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 methodology page on [statistical uncertainty](#).

### Antibody conversion rate

Please refer to the [Glossary](#) section of the COVID-19 Schools Infection Survey, Round 4, pupil antibody data bulletin.

## 7 . Measuring the data

Data presented in this bulletin are from Round 6 of the COVID-19 Schools Infection Survey (SIS). These findings are for SARS-CoV-2 antibodies for pupils only.

Estimates have been weighted and are representative of the ethnicity, gender, and age for all pupils in the sampled local authorities.

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

## Reference period

The results presented in this bulletin are from antibody tests conducted in schools in England between 14 June and 6 July 2021, referred to as Round 6.

Results have also been presented from tests conducted in schools in England between 3 and 20 November 2020 (referred to as Round 1), between 30 November and 11 December 2020 (referred to as [Round 2](#)), and between 15 and 31 March 2021 (referred to as [Round 4](#)).

Round 3 was due to take place in late January 2021. Testing within schools for this round was cancelled because of restricted attendance in schools during the national lockdown.

## Response rates

In Round 6, 141 schools took part in testing (57 primary and 84 secondary).

Before the beginning of Round 4, participation was offered to all year groups in secondary schools (excluding Year 11) to improve the sample size. Some 63 out of the 84 secondary schools that took part in Round 6 testing had extended participation to other year groups.

In Round 6 of testing, 12,485 pupils (4,243 primary and 8,242 secondary) took part in at least one current coronavirus (COVID-19) infection or COVID-19 antibody test. The estimated response rate for secondary school pupils, in the year groups that participation was offered to, was 17%. The estimated response rate for primary school pupils was 24%. Details of previous rounds response rates can be found in the [accompanying dataset](#).

## Quality

More quality and methodology information on strengths, limitations, appropriate uses, and how the data were created is available in our [methodology 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.

## 8 . Strengths and limitations

Please refer to the [strengths and limitations](#) section of the COVID-19 Schools Infection Survey, Round 2 bulletin.

## 9 . Related links

### [COVID-19 Schools Infection Survey, England: Round 6, June 2021](#)

Bulletin | Released 11 August 2021

Initial estimates of staff and pupils testing positive for coronavirus (COVID-19) from the COVID-19 Schools Infection Survey across a sample of schools, within selected local authority areas in England. This Schools Infection Survey (SIS) is jointly led by the London School of Hygiene & Tropical Medicine, Public Health England and the Office for National Statistics.

### [Coronavirus \(COVID-19\) Infection Survey, antibody and vaccination data, UK](#)

Bulletin | Updated fortnightly

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